Special Collection: Abstracts from IUNS-ICN Paris 2025

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- International Union of Nutritional Sciences (IUNS)
- Société Française de Nutrition
- Fédération Française de Nutrition

Total Contributions:

- Participants: 3,805
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- Abstracts: 2,302

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This special collection comprises the abstracts presented at the 23rd edition of the IUNS International Congress of Nutrition (IUNS-ICN Paris 2025), covering a broad range of topics within nutritional science, including:

- The future of nutrition recommendations
- Climate change, sustainability and nutrition
- Food science, gastronomy and life quality
- Global health and planetary nutrition
- Public health and nutrition throughout the life cycle
- Non-communicable diseases
- Precision and clinical nutrition
- Basic research in nutrition

All abstracts were received via the IUNS-ICN Paris 2025 submission system and reviewed in accordance with the IUNS-ICN Paris 2025's scientific review procedures.

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The future of nutrition recommendations

OAP 01 - THE FUTURE OF NUTRITION RECOMMENDATIONS

OAP1_01

THE FUTURE OF NUTRITIONAL ASSESSMENT: A DIGITAL SOLUTION USING FACIAL MORPHOMETRICS

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Background and objectives
Current nutritional assessment METHODS are often time-consuming, expensive, and require specialized equipment and clinician expertise. This research proposes a paradigm shift towards accessible, scalable, and efficient digital solutions by utilizing facial morphometrics and machine learning to predict key nutritional parameters.
METHODS

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A total of 71 (30 males, 41 females) free-living Chinese adults, aged 50-85, participated in this cross-sectional observational study. 3D facial scans captured from readily available smartphone technology was employed to predict nutritional parameters. Predictive accuracy of two machine-learning models; the Random Forest (RF) and Extreme Gradient Boosting (XGB) was assessed using 10-fold stratified cross-validation.

RESULTS
The RF model was found to be superior to the XGB model, demonstrating strong predictive accuracy (median r^2 0.51 to 0.92) across six parameters – muscle mass, basal metabolic rate (BMR), visceral fat index, appendicular skeletal muscle mass index, total body fat percentage, and hand grip strength. Muscle mass ($r^2 = 0.92$) and BMR ($r^2 = 0.88$) exhibited the strongest associations, indicating highest predictive accuracy.

CONCLUSIONS
This non-invasive, cost-effective technology offers a scalable approach to nutritional assessment with significant implications for public health. The accurate prediction of muscle mass and BMR, for example, enables efficient community-based screening for undernutrition and frailty in older adults, while assessment of body fat percentage can aid in detecting overnutrition and associated health risks. This digital solution holds considerable promise for improving population-level health outcomes through early detection and intervention.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP1_02

EXPLORING THE ABILITY OF NUTRI-SCORE AND NOVA FOOD CLASSIFICATION IN NUTRITIONAL QUALITY ASSESSMENT OF SELECTED FOODS AVAILABLE IN THE SOUTHEAST ASIA FOOD MARKET

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Background and objectives
The rising prevalence of metabolic dysfunction-associated steatosis liver disease (MASLD) in Southeast Asia, with a 29% prevalence rate—the highest in the Asian region—represents a significant public health challenge.[1] MASLD is closely linked to poor dietary habits characterized by excessive consumption of calorie-dense, nutrient-poor foods and an increasing reliance on ultra-processed food products.[2] This has led to the development of simplified nutrition labels to guide consumers toward healthier choices, with prominent examples including Nutri-Score and the NOVA food classification. However, their effectiveness and suitability for Southeast Asia remain unclear, making the population vulnerable to diet-related diseases.[3] This study aims to explore the ability of Nutri-Score and NOVA classifications on selected foods available in the Southeast Asia market to discriminate the fat, saturated fat, sugar, and salt content of foods

METHODS
Information about (a) the nutrient composition (b) nutritional quality (Nutriscore), and (c) the degree of processing (NOVA classification) of food was obtained from the Open Food Facts database-a freely accessible online database. Spearman correlation analysis was performed to explore the relationships between each food classification score of the Nutri-Score and NOVA systems and the nutrient content of the selected food items

RESULTS
The study analyzed 4,668 food products. Of these, 2,068 were classified using the NOVA system, with 71% in NOVA 4. Using NutriScore, 4,568 products were classified, with most falling under NutriScore D (26%) and E (26%) Spearman's correlation revealed that Nutri-Score exhibited stronger and more comprehensive correlations with nutrient content, particularly for saturated fat ($R = 0.364$, $P < 0.001$), sugar ($R = 0.355$, $P < 0.001$), and fiber ($R = -0.175$, $P < 0.001$), underscoring its effectiveness in differentiating the nutritional quality of foods. In contrast, NOVA classification demonstrated weaker correlations, with its strongest associations observed for sugar ($R = 0.149$, $P < 0.001$) and salt ($R = 0.138$, $P < 0.001$), reflecting its focus on the degree of food processing rather than nutrient composition.

CONCLUSIONS
These findings suggest that Nutri-Score and NOVA classifications serve as complementary tools, with Nutri-Score excelling in guiding healthier food choices based on nutrient content, while NOVA provides valuable insights into the level of food processing. This study supports developing better front-of-pack labels in Southeast Asia by addressing both aspects.

CONFLICTS OF INTERESTS
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OAP1_03

THE RISK OF NON-COMMUNICABLE DISEASES IN ADULTHOOD ASSOCIATED WITH CHILDHOOD AND ADOLESCENCE EXPOSURE TO MALNUTRITION IN LOW- TO MIDDLE-INCOME COUNTRIES: A SYSTEMATIC REVIEW AND META-ANALYSIS OF OBSERVATIONAL STUDIES

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Background and objectives
Despite the significant global burden of all forms of malnutrition and non-communicable diseases (NCDs), the long-term NCDs risks associated with childhood and adolescence malnutrition in Low- to Middle-Income Countries (LMICs) remain poorly understood. This review aims to synthesise evidence on the adulthood NCDs risks associated with childhood and adolescence exposure to all forms of malnutrition in LMICs.

METHODS
A systematic review was conducted, searching Ovid Embase, Ovid Medline, Web of Science, and Google Scholar for studies published from 2019 to 2024. Studies in children under 19 years exposed to undernutrition (stunting, wasting, and underweight), micronutrient deficiency, or overnutrition (overweight, obesity) compared to controls. Those reporting main types of NCDs, including cardiovascular disease (CVD), cancer, diabetes, hypertension, and chronic respiratory diseases, were eligible. As there was heterogeneity between studies assessed by Cochran's Q test, I^2 and τ^2 statistics, random-effects models using risk ratios (RR) and 95% confidence intervals were used to conduct the meta-analysis. To assess heterogeneity by study level characteristics, we considered multivariable meta-regression using a mixed-effects model.

RESULTS
Of 4,326 studies identified, 40 observational studies from 10 LMICs were included. Childhood undernutrition was consistently associated with an increased risk of hypertension (RR: 1·36, 95% CI: 1·16–1·59; $Q < 0·001$, $I^2 = 99·6\%$, $\tau^2 = 0.09$), diabetes (RR: 1·40, 95% CI: 1·20–1·64; $Q < 0·001$, $I^2 = 97\%$, $\tau^2 = 0·06$), CVD (RR: 1·63, 95% CI: 1·12–2·37; $Q < 0·001$, $I^2 = 99\%$, $\tau^2 = 0·3$), and chronic respiratory disease (RR: 1·48, 95% CI: 1·13–1·94; $Q < 0·05$, $I^2 = 42\%$, $\tau^2 = 0·01$). Childhood overnutrition was also associated with an increased risk of hypertension (RR: 3·0, 95% CI: 2·29–4·08; $Q < 0·01$, $I^2 = 82\%$, $\tau^2 = 0·07$), as well as diabetes, and CVD outcomes in our narrative summary. The heterogeneity between studies was often attributed to sample size, study quality, and age at exposure and outcome measurement.

CONCLUSIONS
Exposure to both undernutrition and overnutrition during childhood and adolescence increases the risk of several major types of NCDs in adulthood in LMICs. To address the burden of NCDs in LMICs, future research should focus on strategies to prevent all forms of undernutrition and reduce the growing prevalence of overweight and obesity in this region.

CONFLICTS OF INTERESTS
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OAP1_04

ANALYZING CONCORDANCE BETWEEN MUAC, MUACZ, AND WHZ IN DIAGNOSING ACUTE MALNUTRITION AMONG CHILDREN UNDER 5 IN SOMALIA

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Background and objectives
Acute malnutrition (wasting) affected an estimated 45 million children under 5 (CU5) globally in 2023. Wasting is measured using a child's mid-upper arm circumference (MUAC<12.5cm), weight-for-height z-score (WHZ<-2 SD), or nutritional edema. In low-resource contexts and community health screenings, MUAC is often the only measurement used to regularly screen for malnutrition, but recent research suggests using MUAC alone fails to diagnose 25%-80% of WHZ-wasted children. MUACZ, an age-adjusted MUAC z-score, may identify additional cases missed by MUAC alone. The aim of this analysis was to examine concordance between MUAC, MUACZ, and WHZ prevalence estimates of wasting among 1,408 CU5 enrolled in a cluster-randomized controlled trial in two regions of Somalia.

METHODS
Anthropometric data was collected in December 2023. This analysis explored wasting prevalences across anthropometric indicators, concordance between indicator pairs, linear regression modelling with WHZ as the outcome, and receiver operating characteristic (ROC) analysis using WHZ as a gold standard to examine alternative MUAC and MUACZ thresholds. Stratified analyses by age (9-23 months vs. 24-59 months) and region were also conducted.

RESULTS
Wasting prevalence was 1.5% by MUAC, 8.5% by MUACZ, and 14.8% by WHZ. MUAC alone failed to identify 94% of WHZ-wasted children. There was slight concordance between MUAC and WHZ (κ=0.089) and fair concordance between MUACZ and WHZ (κ=0.385). In regression models, MUAC, age, sex, and stunting were all statistically significant variables ($p<0.001$) for estimating child WHZ and age confounded the relationship between MUAC and WHZ. Using WHZ as a gold standard, a MUAC of 13.7cm and MUACZ of –0.9 SD both accurately diagnosed >82% of wasted children ages 9-23 months. A MUAC of 14.4cm and MUACZ of -1 SD both accurately diagnosed >76% of wasted children ages 24-59 months.

CONCLUSIONS
Poor concordance between MUAC and WHZ in the literature and this analysis should prompt review of wasting measurement guidelines. Stratified analyses and regression modelling showed increased MUAC with age > 24 months among CU5. Practitioners should consider revising organizational and programmatic guidelines to include age-specific MUAC thresholds, MUACZ, or WHZ in screening procedures in order to accurately target and treat all malnourished children. Policymakers should consider how adapting screening guidelines impacts health centers and treatment availability in humanitarian settings. Future studies should evaluate morbidity and mortality associated with increased MUAC thresholds.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP1_05

EFFECT OF PLANT-BASED MEAT ANALOGUE VS ANIMAL-BASED MEAT DIETS ON MICRONUTRIENT INTAKE AND BIOLOGICAL STATUS OF HEALTHY ADULTS – AN 8-WEEK RANDOMIZED CONTROLLED TRIAL

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Background and objectives
Plant based meat analogues (PBMA) have gained popularity due to concerns over planetary and human health and safety(1). Designed to replicate the organoleptic qualities of meat, PBMAs have distinct nutritional profiles, necessitating an evaluation of how dietary substitution impacts overall nutrient status and health, although there remains paucity in evidence(2). This study investigated the impact of protein-matched PBMA diets (PBMD) and animal-based meat diets (ABMD) on nutrient intake, circulating micronutrient status, and bone mineral density (BMD) in a Singaporean, Chinese adult population.

METHODS
In an 8-week parallel randomised controlled trial, 89 healthy participants replaced their habitual protein rich food with protein matched quantities of either animal-based meats or their corresponding PBMAs, while maintaining the other components of their habitual diet. Complete micronutrient analysis of cooked intervention foods was conducted, and nutrient density was assessed using the nutrient rich food index (NRFI)(3). Dietary intake was assessed using 3-day food records, biological micronutrient status was determined via vitamin and mineral levels in fasting blood samples, and BMD via dual energy X-ray absorptiometry (DXA) were analysed at both baseline and at the end of the study period.

RESULTS
After the intervention, PBMD group had significantly greater consumption of thiamine, vitamin B6, folate, sodium, potassium, magnesium, iron and calcium ($p < 0.001$) with the PBMAs having higher NRFI scores. ABMD group had greater intakes of riboflavin, niacin and zinc ($p < 0.05$). Significant changes in biological micronutrient status were only observed for vitamin B12 (ABMD: -10.40 pmol, PBMD: 22.97 pmol, $p = 0.004$), folate (ABMD: -2.93 nmol, PBMD: 2.75 nmol, $p = 0.004$) and selenium (ABMD: -0.05 umol, PBMD: 0.04 umol, $p = 0.006$). These observations allude to differences in bioavailability of micronutrients from the different diets. Although changes in whole body BMD were statistically significant ($p = 0.03$), the magnitude of change appears marginal. This may be supported by calcium status and bone turnover biomarkers RESULTS where no significant differences were observed.

CONCLUSIONS
Collectively, substantial differences observed in micronutrient intakes between diets did not correlate with changes in circulating micronutrient status. These RESULTS emphasize that the effect of PBMA fortification on micronutrient status is influenced by other factors such as bioavailability and absorption. Hence, further studies are warranted to evaluate the impact of plant-based meat consumption on dietary intake, micronutrient status, and health outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP1_06

TRANSFORMING LOCAL FOOD SYSTEMS USING URBAN AGRICULTURE FOR BETTER NUTRITION OUTCOMES

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Background and objectives
Urban food and nutrition insecurity continues to expose the gaps within the food system, largely affecting communities to have access to affordable nutritious foods. The study aimed to educate and train farmers on nutrition-sensitive and sustainable food production approaches using legumes. An operationalised food and nutrition education programme was rolled out for a two-year period. Thereafter nutrition outcomes were examined to determine nutritional status, including production outcomes.

METHODS
The intervention study involved two case controls (n=103) that comprised of an experimental group (EG: n=53) and a control group (CG: n=50). Data was obtained for both groups for yields of legume production, dietary intake, and biochemical data. The data was analysed using Analysis of Variance (ANOVA), Food Finder software and a Wilcoxon test statistic (W) for the same group on a single independent variable analysis. Correlation was considered significant at the 0.05 level.

RESULTS
There was a high significance ($p=0.001$) amongst the six legume varieties produced, showing the highest yield for P. vulgaris L compared with other varieties. Dietary diversity score (DDS) of legume intake with a FGDS mean was from 2.4 (SD ± 1.35) to 5.7 (SD ± 2.56) showed improvement. Statistical significance was observed when comparing the pre- and post-intervals for these variables. The EG blood RESULTS indicated nutrient improvement with $p<=0.05$ for blood glucose ($p=0.003$) and cholesterol ($p=0.001$) as opposed to the CG.

CONCLUSIONS
Better nutrition outcomes are achievable when using urban agriculture for sustainable food production and can contribute to household food and nutrition security.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP1_07

POSITIONING NUTRIENT PROFILING AS A STRATEGY TO ASSESS SCHOOL FOOD POLICY: EVIDENCE AND IMPLICATIONS FROM CANADIAN SCHOOL FOOD PROGRAMS

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Background and objectives
School food programs (SFPs) influence children's dietary behaviors, health, and academic performance worldwide. However, many SFPs lack standardized frameworks for evaluating nutritional quality, limiting their long-term effectiveness. While Canada's recently released National School Food Policy emphasizes consistent and transparent monitoring, it does not mandate nutrition evaluation, and the variability among Canadian SFPs complicates routine assessment. This study introduces the Canadian Food Scoring System (CFSS), a nutrient profiling model (NPM) based on Canadian labelling regulations and Canada's Food Guide (CFG) 2019, to evaluate the nutritional quality of food items in Canadian SFPs. NPMs like the CFSS can support policy implementation by providing consistent, policy-driven tools for nutritional assessment, promoting healthier and more sustainable school food environments.

METHODS
SFP menu data were collected from school food providers across Canada. The nutritional quality of individual food items was assessed using the CFSS. Scores were weighted and summed based on the proportion of the Health Canada-defined Reference Amount (RA) each item contributed to the meal, with the total representing the meal's overall nutritional quality. Based on CFSS scores, meals and food items were classified into one of five categories: "excellent," "good," "fair," "poor," or "very poor" choice. Pearson's correlation was used to compare CFSS scores with Healthy Eating Food Index (HEFI) 2019 scores, an index of dietary quality measuring adherence to CFG 2019.

RESULTS
RESULTS from 70 SFPs serving over 20% of Canadian schools revealed CFSS scores of 65% of the maximum score for breakfasts, 56% for lunches, and 67% for snacks. Overall, 60% of food items and 57% of meals were classified as "good" or "excellent" choices, while 26% of food items and 15% of meals were classified as "poor" or "very poor" choices in accordance with CFG 2019 guidance. CFSS scores were moderately correlated with HEFI scores (r=0.67).

CONCLUSIONS
Although Canadian SFPs demonstrate moderate adherence to CFG 2019, a need remains for nationally harmonized systems to monitor their nutritional quality, particularly given the resource and capacity constraints faced by many existing programs. The CFSS and similar NPMs offer strong potential for routine SFP monitoring, supporting policy-driven nutritional improvements, informing future nutrition recommendations, and contributing to more sustainable school food systems both in Canada and globally.

CONFLICTS OF INTERESTS
This research is a part of the Feeding Kids, Nourishing Minds project, which is funded by the Joannah and Brian Lawson Centre for Child Nutrition, University of Toronto and the unrestricted donation from the President's Choice Children's Charity. PCCC had no role or input in any aspect of the research project. The authors had no financial relationships with any organizations that might have an interest in the presented

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work in the previous five years; no other relationships or activities that could appear to have influenced the presented work.

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OAP1_08

EATING ARCHITECTURE AND CARDIOMETABOLIC HEALTH IN CHILDREN AND EARLY ADOLESCENCE

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BACKGROUND AND OBJECTIVES

Existing findings on the relationship between eating architecture (EA) –which refers to the timing, size, and frequency of eating –and cardiometabolic health are both conflicting and limited mostly to adult populations. Little is known about how EA evolves during childhood and its implications for health. This study aims to examine the development of EA from childhood to adolescence and its relationship with cardiometabolic health.

METHODS

Linear regression was performed to study the associations between eating architecture (EA) patterns from principal component analysis (PCA) and cardiometabolic health indicators (e.g., BMI, waist circumference (WC), lipid profile, blood pressure) at ages 7 (n=7285), 10 (n=7470) and 13 years (n=6106) using data from the Avon Longitudinal Study of Parents and Children (ALSPAC), adjusting for relevant covariates. Sensitivity analyses assessed the impact of energy intake under-reporting. Estimates are presented as standardised coefficients (β), representing the change in the outcome variable (e.g., BMI) in standard deviations (SD) for each 1 SD change in the explanatory variable (i.e., EA patterns).

RESULTS

The 'Lunch' pattern was consistently associated with higher cardiometabolic risk across timepoints, exemplified at age 10y by its positive associations with BMI (β=0.09, 95% CI=0.06, 0.12, p<0.0001), WC (β=0.10, 95% CI=0.07, 0.12, p<0.0001), and triglycerides (β=0.05, 95% CI=0.01, 0.09, p=0.01), in addition to total energy intake (β=0.37, 95% CI=0.35, 0.39, p<0.0001). These associations were consistent in magnitude and direction across all timepoints. In contrast, the 'Breakfast' pattern showed little evidence of an association with increased cardiometabolic risk. While some associations were attenuated when analyses were restricted to valid reporters, such as between the 'Evening' and 'Late-evening' patterns and BMI, others, including 'Lunch' and 'Breakfast' pattern's associations with adiposity measures, remained robust.

CONCLUSIONS

Overall, earlier eating patterns were associated with more favourable health outcomes, while the 'Lunch' pattern was linked to higher cardiometabolic risk. These findings highlight the importance of considering the structure of eating throughout the day, beyond just diet composition, offering an opportunity to design targeted nutritional interventions that improve health by better managing eating patterns. Longitudinal analyses will further clarify the long-term impact of eating architecture on health, providing insights into how dietary behaviours evolve and persist over time.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP1_09

ORGANIC FOOD CONSUMPTION AND RISK OF CANCER, TYPE 2 DIABETES MELLITUS AND CARDIOVASCULAR DISEASE IN THE DANISH DIET, CANCER AND HEALTH COHORT

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BACKGROUND AND OBJECTIVES

Organic agriculture and food consumption has grown substantially in recent decades. One major reason of organic food consumption is the perception of its potential health benefits, though evidence supporting these claims is limited. This study aimed to examine associations between organic food consumption and the risk of developing cancer, type 2 diabetes mellitus (T2DM), and cardiovascular disease (CVD).

METHODS

Data were obtained from the Danish Diet, Cancer, and Health cohort, comprising over 41,000 participants. Participants reported their organic food consumption for vegetables, fruits, dairy, eggs, meat, and bread/cereal products on a frequency scale: never, sometimes, often, and always. A composite organic food score was constructed and analyzed as both a continuous variable and in categories (never, low, medium, and high consumption). During follow-up, cases of cancer (n = 9,675), T2DM (n = 4,843), and CVD (n = 5,365) were identified through national health registries. Cox proportional hazards models, adjusted for sociodemographic and lifestyle factors, were used to estimate associations between organic food consumption and disease risk.

RESULTS

Overall organic food consumption was not associated with the risk of overall cancer and a number of major cancer sites. However, compared to never consuming organic foods, organic food intake was associated with a lower risk of stomach cancer (low: HR = 0.50, 95% CI: 0.32–0.78; medium: HR = 0.50, 95% CI: 0.32–0.80; high: HR = 0.54, 95% CI: 0.27–1.07) and a higher risk of non-Hodgkin lymphoma (low: HR = 1.45, 95% CI: 1.01–2.10; medium: HR = 1.35, 95% CI: 0.93–1.96; high: HR = 1.97, 95% CI: 1.28–3.04). Overall organic food consumption was linearly associated with a tendency towards a lower incidence of T2DM (Women, HR: 0.94, 95% CI: 0.89–1.00, Men, HR: 0.95, 95% CI: 0.90–1.00), and a lower incidence of CVD (both women and men, HR: 0.94, 95% CI: 0.89-0.99). Organic food consumption frequencies showed HRs below 1 for T2DM and CVD but were not statistically significant.

CONCLUSIONS

Organic food consumption was not associated with a lower cancer risk but demonstrated modest associations with lower risks of T2DM and CVD.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 18 - THE FUTURE OF NUTRITION RECOMMENDATIONS

OAP18_01

TO BE CLIMATE-FRIENDLY, FOOD-BASED DIETARY GUIDELINES MUST INCLUDE LIMITS ON TOTAL MEAT CONSUMPTION – MODELING FROM THE CASE OF FRANCE

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BACKGROUND AND OBJECTIVES

Although food-based dietary guidelines (FBDG) include guidelines for meat consumption, their setting most often do not explicitly include environmental considerations. For instance, in France, FBDG recommend consuming no more than 500 g of red meat and 150 g of processed meat per week. This study uses modeling to investigate the range of greenhouse gas emissions (GHGe) that can be achieved under FBDG compliance.

METHODS

The study analyzed data collected in 2014 from 29,413 NutriNet-Santé participants to assess their adherence to the French FBDG. GHGe, cumulative energy demand (CED), and land occupation (LO) for organic and conventional foods were obtained from the DIALECTE database.Diets adequate in nutrients, culturally acceptable, and consistent with FBDG were modeled under different GHGe constraints. Environmental, nutritional, and health criteria were then calculated. Models have been developed to modify red meat recommendations by imposing maximum thresholds on total meat consumption.

RESULTS

The average observed adequacy to FBDG was low (19%, SD=25%) and GHGe were 4.34 (SD=2.7%) kgCO2eq/d. The GHGe range of the diets varied from 1.16 to 6.99 kgCO2eq/d, depending up to ~85% on the level of meat consumption. Similar associations were observed for CED, LO and Health Risk Score. At isoenergetic diets, the diet with the lowest emissions had a higher proportion of vegetables, whole grains, and plant-based substitutes. This diet had a lower CED, LO, and a greater proportion of organic foods when compared to the diet with the highest emissions.

Decreasing the upper limit for total meat consumption from 500 to 200g/wk when identifying the healthy diets induced a decrease in their maximum total diet-related GHGe value, from 6.44 to 4.38 kgCO2eq/d.

CONCLUSIONS

While French dietary guidelines contribute, on average, to mitigating climate change and promoting health, this study emphasizes levers in recommended food consumption to more efficiently reduce diets' GHGe and points to total meat as the critical issue to better account for pressure on climate change. Other environmental pressures should also be considered when designing dietary guidelines.

CONFLICTS OF INTERESTS

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OAP18_02

AUSTRALIAN NUTRITION SCIENCE: A PROGRAMMATIC APPROACH TO IMPLEMENTING A NATIONAL STRATEGIC DEVELOPMENT PLAN

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BACKGROUND AND OBJECTIVES

In 2019, the Australian Academy of Science supported a 10-year conceptual development plan entitled "Nourishing Australia: a decadal plan for the science of nutrition". The 2020 COVID-19 pandemic significantly impacted implementation activities. By 2022, a review of progress towards its stated goals (societal determinants, nutrition mechanisms, precision and personalised nutrition and education and training) and its envisioned new science platforms (a digital national data capability and a 'trusted voice' for nutrition science) was timely. This consultative process aimed to reflect on contemporary food, nutrition and health relationships and revise the goals of the decadal plan to reflect pertinent issues and co-design a five-year implementation strategy.

METHODS

Two separate engagement events, held during 2023, bringing together over 150 experienced, mid- and early-career nutritionists with the Academy. Facilitated reflection and discussion led to the co-creation of implementation logic models aligned with revised goals.

RESULTS

There was a clearly identified need for a greater focus on respectful engagement with Aboriginal and Torres Strait Islander communities and a sustained effort to build cross-disciplinary collaboration to realise the plan's societal determinants goals. A synthesis of the goals in the decadal plan resulted in a revised model which integrated precision and personalised nutrition with nutrition mechanisms and education and training became central to the plan rather than a cross-cutting theme. Achievement of work packages in these areas were determined to be necessary to demonstrate the need and support for a national nutrition data capability. A new collaborative of nutrition agencies, the 'Alliance for Nutrition Science Australia' was proposed to become a unified advocacy voice.

CONCLUSIONS

A national approach to develop nutrition science in Australia has been a valuable process, providing a model for engagement with early and mid-career nutritionists. The decadal plan supports aspirational goals. By applying programmatic implementation science processes, the necessary incremental steps towards those goals has commenced: building capacity and capability of the nutrition community. The implementation process provided opportunities to reflect on contemporary issues, including how to influence and build trust in the science of nutrition.

CONFLICTS OF INTERESTS
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OAP18_03

DOES VITAMIN A INTAKE ADVERSELY AFFECT BONE HEALTH?

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BACKGROUND AND OBJECTIVES

Use of high-dose vitamin A supplements and/or frequent consumption of liver and offal may pose significant health risks. High intakes of preformed vitamin A (retinol and retinyl esters) have been associated with adverse effects on bone in animals and humans. However, preformed vitamin A, an essential nutrient, also plays a role in bone development and turnover. This systematic review focused on the relationship between preformed vitamin A intake, bone mineral density (BMD) and fracture risk in humans to determine whether preformed vitamin A adversely impacts bone health at daily doses below the current tolerable upper intake level (UL) of 3000 µg retinol equivalents (RE).

METHODS

The literature was searched in MEDLINE, Embase, and Cochrane Central Register of Controlled Trials to retrieve prospective cohort (PC) studies and randomised controlled trials (RCTs) that assessed the relationship between preformed vitamin A intake and changes in BMD and/or fracture risk.

RESULTS

Seventeen PC studies met the inclusion criteria; no eligible RCTs were identified. Nine PC studies reported on bone fractures, five on BMD, and three on both outcomes. The findings were mixed. Two studies in postmenopausal women indicated an increased risk of hip fractures at intakes of >1500 µg RE/day (OR 2.05; 95% CI 1.05–3.98) and >2000 µg RE/day (RR 1.89; 95% CI 1.33–2.68) compared to intakes <500 µg RE/day, whereas one study in older men reported an increased risk of any fracture (HR 2.00; 95% CI 1.00–3.99) at intakes >1500 compared to <500 µg RE/day. The remaining studies found no significant associations. Available data on BMD was likewise fragmented. Genetic, environmental, and age-related factors, including diet and medication use, were only partially and heterogeneously accounted for in the studies, adding to the uncertainties in characterising the exposure and interpreting the divergent evidence. A meta-analysis was not performed due to the insufficient number of studies and nature of potential sources of heterogeneity.

CONCLUSIONS

This review highlights the conflicting evidence regarding the relationship between preformed vitamin A on bone health in humans at intakes below the UL. While some PC studies report a higher risk of bone fracture at intakes between 1500 and 3000 ug RE/day, the overall body of evidence does not support the causality of such association. To better understand these potential risks, future RCTs testing doses within this range should include bone health outcomes as pre-specified endpoints or safety assessments.

CONFLICTS OF INTERESTS

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OAP18_04

FROM APPS TO BITES: THE IMPACTS OF THE DEVELOPING TECHNOLOGY ON FOOD MARKETING TO SCHOOL-AGED CHILDREN FOOD PREFERENCES

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BACKGROUND AND OBJECTIVES

The rising prevalence of non-communicable diseases (NCDs) in children marks a critical shift in global health, with conditions once common in adults increasingly affecting younger populations. Among the key factors is poor dietary pattern including consumption of energy-dense and nutrient-poor food. Technological advancements shape this behavior by influencing food preferences, promoting unhealthy eating through ads, and simplify access to such foods. This study explores how technological advancements—specifically social media, online food delivery platforms, and e-wallets—impact the eating behavior and food preferences of school-aged children, offering critical insights into the intersection of technology and childhood nutrition.

METHODS

Eight focus group discussions were held with 39 students from four junior and senior high schools in November 2024. Schools were intentionally selected from diverse socioeconomic areas to capture variability. Data were gathered and analyzed thematically.

RESULTS

All participants are actively using social media, online food delivery apps, and e-wallets. TikTok and Instagram effectively promote snacks, drinks, and "viral foods", which are often high in calories and sugar, persuading students to purchase them. Key convincing factors include influencers' credibility, engaging language, appealing visuals, promotion techniques, and number of positive feedback in their comment section. The delivery apps provide easy access to diverse food options, particularly when school or home offerings are limited, with no schools were observed to restrict their use. Promotional deals and discounts drive frequent orders. The students use the app 1-3 times weekly, often buying foods seen on social media out of curiosity. While all participants have e-wallets, daily usage was minimal. Students noted that higher e-wallet balances led to increased spending. Students from lower socioeconomic areas use delivery apps and e-wallets less often and limiting their spending to IDR 30,000 per food or beverage item, while students from higher socioeconomic areas spend between IDR 50,000 and 100,000 for a single product.

CONCLUSIONS

Technological advancements come as influences to students' food preferences and consumption patterns, which vary between the socioeconomic level. The study calls for future strategies to address technology-driven dietary behavior by highlighting salt, sugar, and fat content in a product and promoting nutrient-rich, healthier foods with minimal harmful components to support long-term health of school-aged children.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP18_06

IMPORTANT REVISIONS TO THE NUTRI-SCORE TO ENHANCE CONSISTENCY WITH THE NORDIC NUTRITION RECOMMENDATIONS - INSIGHTS FROM THE NEWTOOLS PROJECT

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BACKGROUND AND OBJECTIVES

The Nutri-Score is a potential candidate for being a harmonized front-of-pack nutrition label in the European Union. However, inconsistencies between Nutri-Score, the Nordic Nutrition Recommendations and the Nordic Keyhole label have been identified within the NewTools project. This study aims to propose and evaluate revisions to the Nutri-Score 2023 algorithms to improve the overall performance and enhance the relevance of the nutrition label in the Nordic countries.

METHODS

Food items in the Norwegian pre-packed foods databases Tradesolution and Unil (n=26,610) were classified using the Nutri-Score 2023 version. To improve discrimination by carbohydrate quality, we propose a penalty for low fibre content in carbohydrate-rich foods and the sugar scale was compressed. To reward fish for its nutritional quality, we propose protein points for all fish products. To improve the variability for high-fat foods, we suggest several revisions, such as extending the scale and points for saturated fat, change the cut-off for inclusion in the algorithm for high-fat foods, and introduce a reward for favourable fat quality in oils. The distribution of Nutri-Score was calculated before and after applying the proposed revisions.

RESULTS

In total, 11% of all products were moved to a different class, of which 3% were moved to a better class and 8% to a poorer class. Most refined pastas shifted from A to B/C, while whole grain pasta largely remained A. Sugar-rich breakfast cereals could no longer obtain a B, and keyhole-labelled fish products could no longer get an E. Products with a high unsaturated fat content, such as mayonnaise, shifted from C/D to B/C. Cheese and cream products obtained much larger variations in scores by fat content.

CONCLUSIONS

The proposed revisions to the Nutri-Score enhanced the alignment with the Nordic Nutrition Recommendations and the Nordic Keyhole label improving its ability to guide towards healthier food choices. The proposed revisions also hold relevance for other European countries and should therefore be considered in future updates of the Nutri-Score algorithms.

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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP18_07

OPTIMIZING ANTENATAL MULTIPLE MICRONUTRIENT SUPPLEMENT ADHERENCE IN CAMBODIA: A SOCIO-ECOLOGICAL APPROACH TO INCREASING UPTAKE

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BACKGROUND AND OBJECTIVES

Many low and middle-income countries are considering a transition from iron-folic acid (IFA) to multiple micronutrient supplements (MMS) in antenatal care but require context-specific evidence on adherence to guide implementation. This study aimed to 1) identify factors associated with high and low adherence to MMS and 2) identify strategies to optimize adherence among pregnant women in Cambodia.

METHODS

This study analyzed data from 516 pregnant women who received 180 tablets of MMS at their first ANC visit during a cluster randomized controlled non-inferiority trial in Kampong Thom province Cambodia. Adherence to MMS was calculated by pill counts, and women were categorized as low adherers (<80% compliance), high adherers (>95% compliance), or those who discontinued MMS before their delivery. A purposive sample of 36 pregnant women (n=12 per category) across all three operational districts were selected to participate in semi-structured, in-depth interviews that explored perceptions, knowledge, and social influences on MMS adherence framed by the socio-ecological model.

RESULTS

Thematic analysis revealed that individual, interpersonal, and societal factors influenced adherence. Individual barriers included forgetfulness and negative pregnancy experiences (e.g., nausea, fatigue), while high adherence was linked to setting up routines to form a habit around taking MMS daily, placing the bottle in a strategic location in the home to act as visual reminders, and having positive beliefs in MMS benefits. Interpersonal barriers included strong norms around IFA and discouragement by family/friends from MMS intake during pregnancy-related symptoms. In contrast, reminders and positive reinforcement from family and endorsement by healthcare professionals during antenatal counseling visits were enablers for high adherence. Societal barriers included apprehension about the "newness" of MMS while social norms supporting prenatal vitamins facilitated adherence. Product characteristics like taste and ease of swallowing show minimal impact on adherence.

CONCLUSIONS

This study highlights the importance of a socio-ecological approach in understanding and improving MMS adherence among pregnant Cambodian women. Key factors include family involvement, targeted education, and reinforcing MMS benefits. To implement these findings, ANC programs should guide women in establishing reminders and routines, train providers in effective counseling, involve family members, implement reminder systems, address societal concerns through community education, and tailor interventions to individual needs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP18_08

ASSOCIATIONS OF GLOBAL BURDEN OF DISEASES STUDY-DERIVED DIETARY SCORES WITH MORTALITY AND CHRONIC DISEASE RISK: A COMPREHENSIVE ANALYSIS FROM THE PROSPECTIVE NUTRINET-SANTÉ STUDY

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BACKGROUND AND OBJECTIVES
To reduce diet-induced morbimortality from chronic disease, the Global Burden of Disease (GBD) network has defined theoretical minimum risk exposure levels (TMREL) for specific food groups and nutrients. TMREL can inform dietary scores for health risk assessment in individual studies, constructed using various METHODS. The validity of these TMREL scores must be evaluated through associations with health outcomes in prospective cohorts.

METHODS
In this study conducted within the NutriNet-Santé cohort, four dietary scores (TMREL-Risk Score, TMREL-Probability of adequacy, TMREL-standardized distance, and TMREL dietary score) were developed using different scoring METHODS, where higher scores indicate less healthy diets. Associations between these scores and the risk of type 2 diabetes, cancer, cardiovascular diseases (CVD), and mortality were estimated using multivariable Cox proportional hazards models, adjusted for a wide range of covariates. Counterfactual and marginal structural models were used to infer causality. Analyses included up to 103,324 participants (78.3% women, mean age of 43.6 years [SD=14.6]), followed for a median of 8.47 years (IQR=14.7) from 2009 to 2024.

RESULTS

The associations were globally significant but varied in magnitude depending on the score used and health outcome considered. HRs ranged as follows: for mortality, from 1.12 (95%CI =1.07-1.18) for TMREL-Stdis to 1.18 (95%CI =1.12-1.24) for TMREL-DI; for overall cancer, from 1.07 (95%CI =1.03-1.12) for TMREL-RS to 1.09 (1.04-1.13) for TMREL-PA; for CVD, from 1.07 (95%CI =1.00-1.16) for TMREL-PA to 1.12 (95%CI =1.04-1.20) for TMREL-RS; and for type 2 diabetes, from 1.33 (95%CI =1.23-1.43) for TMREL-DI to 1.47 (95%CI =1.36-1.59) for TMREL-PA. Marginal structural Cox models strengthened all associations compared to classical analyses. Standardized survival curves revealed clear associations, particularly for cancer and type 2 diabetes risk.

CONCLUSIONS

Dietary scores based on GBD's TMREL can serve as key indicators for assessing diet quality in relation to long-term health, and the use of different scoring systems helped evaluate the robustness of these associations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP18_09

PROPOSED NUTRIENT PROFILES FOR ALTERNATIVE PROTEIN FOODS

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BACKGROUND AND OBJECTIVES

At the 43rd Session of the Codex Committee of Nutrition and Foods for Special Dietary Uses, a proposal for "Guidelines including General Principles for the Nutritional Composition of Foods and Beverages made from Plant-based and other Alternative Protein Sources" and scientific advice from the Food and Agriculture Organisation (FAO) was requested.

METHODS

The derivation of nutrient profiles for meat and dairy imitation foods and beverages was organised in a series of three tasks. 1) a review of the literature on the nutritional composition of existing alternative protein sources , 2) a review of the existing regulatory or scientific composition standards (nutrient profiles) for meat/dairy imitations and 3) the proposal of a set of nutrient targets, nutrient profile, for meat/dairy imitation products. A pilot branded food composition database for existing meat/dairy imitation products was created from open access food data sources, to test the feasibility of the proposed nutrient and test the performance of the proposed nutrient profiles on real-life data.

RESULTS

The literature review identified 82,366 published reports, including n=45 reports on the nutritional composition of marketed alternative protein foods, n=58 reports on experimental foods and n=28 reports on the nutritive values of insects and insect-derived proteins. The most striking differences in composition were seen in plant-based dairy products as compared to their animal counterparts and mostly in cheese and milk imitations, which have significantly lower protein content than their animal-based counterparts. In the case of meat and fish imitations, the nutritional composition of imitations to their animal-based counterparts is comparable to a great extent. Examining regulatory and scientific standards across multiple regions the report found a lack of specific nutrient profiles tailored to alternative proteins while two Front-of-Pack labelling schemes propose nutrient targets for plant-based foods. The importance of considering protein quality indices was highlighted in the regulation without a clear consensus across countries.

CONCLUSIONS

The proposed nutrient profiles include protein, sodium, total fat and micronutrient targets and so acceptable feasibility.Although the protein and micronutrient targets are the main and most immediate interest in setting nutrient profiles for such foods and beverages, consideration of their nutrient profiles in a more holistic manner is needed to address their shortcomings in sodium and fat content. Protein quality adjustments may be of interest in the regulation of alternative protein foods but no proposal was currently made towards it.

CONFLICTS OF INTERESTS

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OAP 34 - THE FUTURE OF NUTRITION RECOMMENDATIONS

OAP34_01

ARTIFICIAL INTELLIGENCE AND LARGE LANGUAGE MODELS TO MAKE NUTRITION INFORMATION MORE ACCESSIBLE

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BACKGROUND AND OBJECTIVES

Nutrition research is a complex field resulting in large amounts of data that need to be synthesized and disseminated. Large language models (LLMs) may be useful for managing these data in two ways: 1) distilling and extracting granular data from publications to allow for efficient evidence synthesis, and 2) making research accessible and disseminate over the 'last mile' for individuals who can directly apply them to their needs. User-friendly, AI-based chatbot interfaces represent a useful, modern approach to democratizing data access and distillation for multiple audiences/user-groups, including students, researchers, consumers, and policymakers.

METHODS

Through collaboration between domain knowledge experts in nutrition and specialists in the field of human-computer interaction, we have developed three LLM-based chatbots. These include 1) "Chat with Your Data" (CWYD), where users can upload a dataset and ask the chatbot questions about the dataset; 2) "SciDaSynth", which automatically extracts data from articles for evidence synthesis based on prompts from the user, trained on a micronutrient retention systematic review dataset; 3) "AI Health Information", a chatbot restricted to reputable/trustworthy sources on health and nutrition such as Cochrane, Campbell, Office of Dietary Supplements, and WHO. Coding for all chatbots was done in R and Python. For SciDaSynth, data extraction and structuring were done through retrieval augmented generation (RAG)-based technical framework using LLMs. Guardrails against hallucination, a common issue with LLMs, were also integrated into each chatbot.

RESULTS

CWYD successfully answers users' questions and generates visuals, tables, and plain language summaries from datasets, easily transferable to presentations for dissemination. SciDaSynth usability and effectiveness was tested among users who routinely conduct systematic reviews, finding favorable opinions as well as faster task completion times compared to traditional METHODS. Finally, AI Health Information deploys Fact Sheet-style output into the following format: Problem, Current WHO Recommendations, Current State of the Evidence, and Ongoing Clinical Trials, and includes citations, to assist multiple user groups in finding reputable information on a health or nutrition question quickly.

CONCLUSIONS

LLM-based chatbots can investigate users' questions from key data sources and output plain-language answers to questions, visualizations, as well as extract data for systematic reviews. LLMs represent a key innovation for evidence synthesis tasks as well as dissemination.

CONFLICTS OF INTERESTS

SM holds equity in VitaScan, a startup company, aiming to commercialise some of his research on point-of-care assessment of nutritional status as a faculty member at Cornell University

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OAP34_02

THE CONSUMPTION OF POULTRY AND RABBIT PRODUCTS ENRICHED WITH ALGAL DHA IS AN INTERESTING STRATEGY FOR REDUCING THE DEFICIT OF THIS FATTY ACID IN THE FRENCH POPULATION

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BACKGROUND AND OBJECTIVES

The average French consumption of DHA is lower than the official recommendations (1,750 mg / week) because the only significant sources are fish and certain offal's. However, it is possible to enrich egg, rabbit and chicken meat with DHA by incorporating algal DHA into the feed (1) with benefits presented here.

METHODS

Weekly DHA intakes were calculated for the average population and for a one consuming all the products presenting significant DHA intakes in 10 scenarios corresponding to the enrichment or not of the products mentioned above (STANDARD and ENRICHED) and to 5 types of food consumption: consumption corresponding to the INCA 3 study (A), consumption A without fish consumption (B), consumption B but doubling of egg consumption (C), consumption B but with increase of the rabbit meat consumption (the one of the 1980s) (D), consumption B with an increase in both egg and rabbit meat consumption (E). The DHA contents used in these calculations come from the Ciqual tables (2) for the standards products and from our researches for the enriched ones (1).

RESULTS

Table 1. Quantity of DHA mg/week with 'ENRICHED' and 'STANDARD' products

Diet	Average population		Product consumers	
	Quantity of DHA mg/week		Quantity of DHA mg/week	
	STANDARD	ENRICHED	STANDARD	ENRICHED
A	931	1 201	2 558	3 735
B	66	336	242	1 419
C	110	508	384	1 973
D	71	395	262	1 646
E	114	562	403	2 190

The DHA intake of consumers of DHA enriched eggs and rabbit/chicken meat increases significantly. It exceeds 3,500 mg/week when fish is also consumed, and 1,750 mg/week when not; if egg consumption doubles. However, the average intake of the population approaches 1,750 mg/week only when fish and enriched products are consumed.

CONCLUSIONS

Consumption of eggs and rabbit/chicken meat enriched with DHA makes it possible to achieve the primary prevention level even in the absence of fish, and the secondary prevention one in its presence. Increasing

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consumption of DHA-enriched eggs and rabbit meat is an interesting strategy for reducing deficiency in this fatty acid.

CONFLICTS OF INTERESTS

Anne-Yvonne Prigent Clarisse PalaciosMichel Colin

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OAP34_03

ASSOCIATIONS BETWEEN THE CONSUMPTION OF ARTIFICIAL SWEETENERS, EXCESS WEIGHT GAIN AND GUT MICROBIOTA DIVERSITY IN THE NUTRINET-SANTÉ PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES
Reducing sugar intake to prevent chronic diseases is recommended by the WHO. As an alternative, the use of artificial sweeteners in food and beverage has increased. Yet, the long-term impact of using artificial sweeteners on weight status or chronic disease incidence is still debated, notably in light of experimental and epidemiological RESULTS showing adverse outcomes, including through alterations of the gut microbiota. Our study's objective was therefore to investigate associations between the consumption of artificial sweeteners and excess weight gain, as well as gut microbiota diversity.

METHODS

Our analyses included 101,182 adults from the French NutriNet-Santé prospective cohort study followed since 2009. Repeated 24-hour dietary records, including brands for industrial products, linked with data on qualitative and quantitative content in food additives, were used to assess intakes of artificial sweeteners from all dietary sources. Weight and height were collected every 6 months through a validated online questionnaire. Fecal microbiota profiles were derived from 16S rRNA sequencing of stool samples collected in a subcohort in 2024. Associations between intake of artificial sweeteners (total and most consumed: aspartame, acesulfame K, sucralose), BMI gain, risk of excess weight, and fecal microbiota alpha-diversity were studied using multi-adjusted mixed, Cox or ANCOVA models, respectively.

RESULTS

Compared with non-consumption, a higher intake of artificial sweeteners (> sex-specific median) was associated with higher BMI gain (β higher consumers x time = 0.02, P < 0.001) as well as a higher risk of overweight (9641 / 367,549 person-years; HR=1.37 [1.28-1.47], P-trend < 0.001) and obesity (4062 / 531,650 person-years; HR=1.45 [1.32-1.59], P-trend < 0.001). Preliminary analyses including 3659 fecal microbiota profiles also suggested a trend toward lower diversity (richness: β= -3.18, P=0.02; Shannon index: β= -0.04, P=0.05) associated with higher consumption of artificial sweeteners.

CONCLUSIONS
In this study, a higher consumption of artificial sweeteners was associated with a higher risk of excess weight gain, and with a lower gut microbiota diversity (preliminary data). These RESULTS suggest potential long-term adverse effects of the consumption of artificial sweeteners at doses below the admissible daily intake, and therefore provide important data for safety assessment. Further analyses of gut microbiota composition are ongoing.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP34_04

Development of a short food frequency questionnaire to estimate the consumption of plant-based meat and animal foods analogs, preliminary RESULTS from a French cohort

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BACKGROUND AND OBJECTIVES

The consumption and supply of plant-based analogues of meat and animal products, such as plant drinks made from soya or oats, patties or burgers made from cereals or pulses, have developed considerably in recent years. However, there is no questionnaire that is both short and comprehensive enough to provide a detailed estimate of the diversity of consumption of these relatively new foods. The main aim of this study was to create a short food frequency questionnaire (FFQ) targeting these products. The secondary objective was to analyse the data obtained from this questionnaire in order to estimate the consumption of these foods in a large sample from a prospective French cohort.

METHODS

The questionnaire was designed on the basis of a litterature review, with a focus on existing FFQs. A survey of products available on the French market was also carried out. The design of the FFQ items was based on the validated METHODS of measurement of both frequencies and quantities from the SU.VI.MAX and NutriNet-Santé studies. Preliminary descriptive statistics aimed to describe the frequency of consumption of these foods, in the total sample and by groups of individuals following diets that reduce or exclude animal products (vegetarianisms), using univariate statistical tests.

RESULTS

We identified 1,941 foods that were gathered into 6 dietary analogue groups based on their main ingredient (e.g. legumes or cereals), corresponding to 128 food items in the final questionnaire. The highest frequencies of foods that participants declared to consume weekly were: vegetable drinks (13.8% of the sample), vegetable patties, burgers or steak (7.9%) and tofu (3.9%). The percentage of individuals consuming these analogues on a weekly basis by types of diet is presented in the following table:

Plant foods	Tot. n = 14,928	Meat eaters, n = 3,591	Meat reducers n = 9,729	Fish eaters n=675	Vegetarians n = 620	Vegan n = 313	p-value (Chi²)
Milks	13,8%	6,4%	12,4%	29,5%	37,4%	59,7%	<0,001
Burgers	7,9%	1,8%	6,1%	28,3%	31,8%	41,9%	<0,001

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Tofu	3,9%	0,8%	2,3%	11,9%	20,6%	41,9%	<0,001

CONCLUSIONS

The questionnaire enabled a detailed measurement of the consumption of plant based analogs of animal products. This questionnaire should provide a better understanding of their impact on health over time to enhance future dietary guidelines.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP34_05

PLANETARY HEALTH DIET COMPARED TO DUTCH DIETARY GUIDELINES: NUTRITIONAL CONTENT AND FOOD GROUPS CONTRIBUTIONS

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BACKGROUND AND OBJECTIVES

To compare the PHD with DDG in terms of food groups, servings, nutritional content, and food groups contributions.

METHODS

We modeled two theoretical diets, the PHD (PHD-NL) and another based on the DDG (DDG-NL), using the Dutch National Food Consumption Survey (FCS-2016) and Dutch Food Composition Database to calculate the nutritional content and compared it within the food groups contributions for all the nutrients.

RESULTS

The PHD included higher quantities of vegetables, fish, legumes, and nuts, while the DDG suggested more significant amounts of cereals, tubers, starchy vegetables, dairy, and red meat. We observed differences in macronutrient distribution; while both diets lacked sufficient vitamin D, calcium content was lower in the PHD-NL. The PHD-NL had higher levels of fiber, vegetable protein, unsaturated fats, and non-heme iron, while vitamins B2, B6, B12, and calcium were lower than in the DDG-NL diet. In these healthy, sustainable diets, rice, wheat, corn, and whole grains had a contribution ≥30% of total content for nutrients like polysaccharides, fiber, copper, iron non-heme, iodine, magnesium, sodium, phosphorus, and zinc. Dark green vegetables had the biggest contributions of beta-carotene and vitamin K. Dairy contributed ≥30% of total content for animal protein, calcium, iodine, and vitamin B2. Chicken, meat, and eggs had ≥30% of total content for hem iron, retinol, and vitamin B12. Fish for polyunsaturated fats (EPA, DHA). Spreadable fats and cooking fats had a contribution ≥30% of total content for unsaturated fats, folic acid artificially added, vitamin D, and E.

CONCLUSIONS

Flexitarian diet orientations like PHD and DDG included a variety of food groups. Plant-based food groups like whole grains and dark green vegetables contribute significantly to achieving a diet with nutritional density. Also, some animal food groups like dairy, chicken, meat, eggs, and fish have good contributions for different nutrients, with major attention to calcium, hem iron, vitamin B12, retinol, and marine fatty acids. Finally, fats, mainly plant-based, had an important contribution to vitamins D and E in front of other food groups. These findings have implications for the adoption of healthy, sustainable diets according to the contributions from different food groups, even with limitations or less consumption, as they are a good source of nutrients.

CONFLICTS OF INTERESTS

I have worked with some private food companies, also with UNICEF, Panamerican Health Organisation.

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OAP34_06

MAPPING SPATIAL PATTERNS OF THE PHYSICAL FOOD ENVIRONMENT OF KUALA LUMPUR MALAYSIA: A GIS AND PARTICIPATORY APPROACH

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BACKGROUND AND OBJECTIVES
The food environment is closely associated with community health status. However, the food environment is less well understood in a low-middle income country like Malaysia, due to its complex landscape, shaped by diversity, economic disparity, and the co-existence of formal and informal food outlets. The heterogeneity of METHODS in mapping the physical food environment has resulted in divergent findings. This study aims to map spatial patterns of the physical food environment and determine the availability of different food outlet typologies in Kuala Lumpur, Malaysia.

METHODS

This cross-sectional study maps formal and informal food outlets using secondary data and public participatory GIS (PPGIS). Participants will help empirically map the food environment, followed by ground-truthing field census to validate geographic data. Attributes of food outlets will include typology, operating hours, availability of delivery service, and categorisation as healthy, unhealthy or mixed. Descriptive analyses will be conducted to describe the overall availability, count and density of different food outlet typologies and its categories. Pearson chi squared test and logistic regression will be performed to test the associations between food outlet typologies and health status of the participants collected from the PPGIS survey. Geo-coding and analysis will be performed using ArcGIS Pro Version 3.3.

RESULTS

It is anticipated that mapping the physical food environment will reveal a higher density of informal food outlets in lower-income neighbourhoods compared to formal outlets. The spatial analyses are expected to reveal clustering of unhealthy food outlets, particularly in urban poor areas, potentially contributing to the prevalence of diet-related NCDs. The PPGIS data may uncover additional food outlets not previously recorded through secondary data. Ground-truthing will validate most of the data, with discrepancies arising mainly in areas where informal outlets are undocumented. The findings are expected to highlight spatial inequalities in food availability and its association with community health status.

CONCLUSIONS

Mapping the physical food environment in Malaysia is crucial for understanding spatial patterns and identifying opportunities for an improved food environment. This approach integrates empirical evidence with community perspectives to inform upstream public health nutrition policies that support sustainable and healthy diets.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP34_07

RECOMMENDATIONS TO ADDRESS THE SHORTFALLS OF THE EAT–LANCET PLANETARY HEALTH DIET FROM A PLANT-FORWARD PERSPECTIVE

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BACKGROUND AND OBJECTIVES

Shifting to dietary patterns rich in plants and low in animal-source foods could substantially lower emissions from the food sector while reducing the global burden of non-communicable diseases. The EAT–Lancet Commission proposed the planetary health diet (PHD) to emphasise plant-forward diets and set global targets to guide an urgently needed food-system transformation. However, the PHD's meat-reduction approach has attracted criticism and prompted debate on the potential micronutrient shortfalls of the plant-forward dietary approach. Since the planet simply cannot sustain human diets defaulting towards animal-based solutions, the objective of this paper is to provide recommendations that address the shortfalls of the PHD, with an emphasis on plant-based sourcing of food.

METHODS

Beginning with a socioecological framework similar to that used by other food system analyses, we further narrowed down the framework by using the Integrative Sustainability Framework (developed by Ahmed and colleagues, 2019) for evaluating national and regional dietary guidelines. To provide an empirical grounding for this paper, we conducted a review of both the academic and grey literature (in English), with the aim of providing an overview of findings from peer-reviewed articles and relevant reports, and documents from the databases of UN agencies and intergovernmental and non-governmental organisations.

RESULTS

Seven key thematic areas have been identified for further development of the PHD. The thematic areas include the bioavailability of plant-based foods and how to improve them; the inclusion of indigenous foods that are nutrient-rich, climate-resilient, economically affordable, and locally available; the options of fortification and supplementation; greater awareness of dietary inclusiveness, consideration of gender-based differences; a broader perspective on highly processed foods; and the need for an alignment with a holistic approach, such as One Health, which promotes the health of humans, animals, and the environment.

CONCLUSIONS

The evidence clearly shows that people and the planet cannot afford to simply default towards animal-based diet solutions. But it is also clear that we need a holistic view of the opportunities and challenges associated with a plant-forward approach to diets. Sometimes that means looking back and recognising traditional knowledge, and sometimes that means breaking with tradition and being open to new technologies.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP34_08

IMPACT OF ULTRA-PROCESSED AND MINIMALLY PROCESSED DIETS FOLLOWING UK DIETARY GUIDANCE ON PHYSICAL FITNESS: A RANDOMISED, CROSS-OVER, CONTROLLED FEEDING CLINICAL TRIAL

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BACKGROUND AND OBJECTIVES

Little is known about the impact of food processing on physical fitness. This study aimed to compare changes in physical fitness between 8-week minimally processed food (MPF) and ultra-processed food (UPF) diets following UK Eatwell Guide (EWG) recommendations.

METHODS

This is a 2x2 crossover randomised controlled feeding trial (NCT05627570). Inclusion criteria included age ≥18, body mass index (BMI) ≥25 and <40 kg/m2, and ≥50% of habitual dietary intake from UPF. Participants were provided with an *ad libitum* 8-week MPF diet and an 8-week *ad libitum* UPF diet, both following EWG recommendations, in a random order. Diets were delivered to participants' homes. Participants were not informed of the food processing groups. Allocation was not concealed from researchers. The primary outcome was percent weight change (reported elsewhere). Exploratory secondary physical fitness outcomes included within-participant differences in the 6-minute walk test (6MWT), sit-to-stand test (STS) and handgrip strength test (HGST) at 8 weeks between UPF/MPF diets. Mixed-effects models were used to assess changes in outcomes.

RESULTS

Between April 2023 and May 2024, 55 individuals were recruited (n=28 to MPF then UPF, n=27 to UPF then MPF diet); 50 participants comprised the intention-to-treat sample. At 8 weeks compared with baseline, 6MWT distance (MPF: 16.3 m (95% confidence interval (95%CI): 4.0, 28.6); UPF: -1.7 m (95%CI: -13.7, 10.4)) was significantly longer on the MPF diet, and STS duration (MPF: -0.7 s (95%CI): -1.1, -0.3); UPF: -0.2 s (95%CI: -0.6, 0.2)) was significantly shorter on the MPF diet, but both were unchanged on the UPF diet. 6MWT post-test heart rate (HR), 6MWT rating of perceived exertion (RPE) and HGST were not significantly different at 8 weeks from baseline on either diet. Improvements in 6MWT distance and STS duration at 8 weeks from baseline were significantly greater on the MPF than UPF diet (Δ6MWT: 18 m (standard error (SE): 7.3), p = 0.017; ΔSTS: -0.5 s (SE: 0.2), p = 0.023). There were no significant differences in changes in 6MWT HR, 6MWT RPE or HGST between diets (6MWT HR: p = 0.070; 6MWT RPE: p = 0.194; HGST right hand max: p = 0.086; HGST left hand max: p = 0.452; HGST dominant hand max: p = 0.196).

CONCLUSIONS

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Eight weeks of diets following national dietary guidance resulted in neutral or favourable changes in physical fitness, with significant differences in 6MWT and STS between diets. The RESULTS highlight important impacts of food processing on physical fitness.

CONFLICTS OF INTERESTS

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OAP34_09

NOVEL APPLICATION OF SYSTEM SCIENCE TOOLS IN STRATEGIC PLANNING FOR THE FUTURE OF NUTRITION

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BACKGROUND AND OBJECTIVES
The complex and shifting landscape of global nutrition challenges the field to re-evaluate our vision and approach to identify future directions. Standard approaches used to build evidence, develop programs, and inform policy fail to consider the complexity of systems, heterogeneity in nutrition and the experience, insight, and priorities of those most affected. System science offers novel METHODS and tools to engage with complex problems, implement potential solutions and develop data for future recommendations.

Using a case study, we describe the application and translation of system science tools for strategic planning at a pediatric nutrition Department.

METHODS

Initial steps included a review of multisector determinants and drivers of nutrition, actionable evidence by authoritative organizations, and analysis of the Department's strengths, weakness, opportunities, and threats in research, education, clinical services, advocacy, and outreach. Information garnered from these processes informed Group Model Building (GMB) workshops, system design, and traditional strategic planning. The Donatella Meadows Framework was used to identify deep leverage points that can drive the future vision and build a pragmatic roadmap.

RESULTS

Department team members and stakeholders engaged in GMB exercises to develop a nutrition causal map. Leverage points within the causal map were overlaid with aligned solutions. Using the Meadows framework, the top four leverage points that were identified to guide the future of the Nutrition Section were (1) creativity & innovation, (2) identity/wellbeing, (3) revenue opportunities/streams, and (4) visibility of the academic pillars of education, research, clinical and community/advocacy. The two deepest leverage points likely to drive a paradigm shift for the Department were diversification of revenue and definition of Department identity, reflecting the tension between idealistic and pragmatic visions. Recommended topical areas within the leverage points that aligned with the Department's mission included public health and nutrition (undernutrition, overnutrition, micronutrient deficiency) through the life cycle, precision nutrition, the intersection of disordered eating and nutrition, and community education.

CONCLUSIONS
System science METHODS were successfully used to determine key leverage points with the highest probability for impact and innovation. Using a similar approach may benefit nutrition organizations who are evaluating their trajectory, vision and future goals.

CONFLICTS OF INTERESTS
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OAP 49 - THE FUTURE OF NUTRITION RECOMMENDATIONS

OAP49_01

UNDERSTANDING TRADE-OFFS: COST-EFFICIENCY VS. COVERAGE IN VITAMIN A SUPPLEMENTATION STRATEGIES IN CÔTE D'IVOIRE

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BACKGROUND AND OBJECTIVES

In 2018, Côte d'Ivoire transitioned to routine vitamin A supplementation (VAS) through health facilities, community fixed sites, and door-to-door catch-up events. This study evaluates the cost-effectiveness and coverage of these strategies in Ferkessédougou and Niakaramadougou from July-December 2023.

METHODS

Coverage data were collected from 2,706 households with children aged 6–59 months using post-event coverage surveys with a two-stage cluster sampling design. Cost data were obtained from 91 stakeholders across 16 health facilities, four regional offices, and nine partner organizations. Cost-effectiveness was calculated by dividing total costs per district by the number of children supplemented for each strategy.

RESULTS

In the second half of 2023, the total cost of the VAS program was approximately USD $40,895.95 (47.2% from Ferkessédougou; 52.8% from Niakaramadougou). Among all strategies employed in the two districts, the catch-up strategy in Niakaramadougou (Dec 2023) was the most expensive at USD $8,956.37, while the health-facility distribution strategy in both districts had the lowest costs averaging USD $6,801.11. Ferkessédougou achieved a coverage rate of 8.7% at health facilities and 51.2% for the advanced strategy. In Niakaramadougou, coverage was 20.4% at health facilities and 43.3% for the catch-up strategy. Within the districts, the cost per child supplemented was lowest in Ferkessédougou for the advanced strategy (USD $0.78), while the July 2023 catch-up campaign had the highest cost per child at USD $2.50.

CONCLUSIONS

The study highlights a trade-off between cost-efficiency and coverage, with advanced strategies offering cost-effectiveness and catch-up events providing higher coverage at higher costs.

CONFLICTS OF INTERESTS
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OAP49_02

LEVERAGING BINTI GROUPS (ANTENATAL (ANC) GROUPS) TO EMPOWER PREGNANT ADOLESCENT GIRLS AND YOUTHS TO ADDRESS HEALTH AND NUTRITION NEEDS FOR MATERNAL AND INFANT WELL-BEING

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BACKGROUND AND OBJECTIVES

Pregnant adolescent girls face health risks and complications due to their unformed bodies. Their access to antenatal care services remains low, despite their heightened need for close monitoring. The objective of the Binti group; is to offer a platform to empower them by providing peer support and targeted education on health, nutrition, and self-care during and after pregnancy. This abstract explores how Helen Keller supported Kilifi County, Kenya to use Binti groups in equipping this group with the knowledge, skills, and resources to navigate health and nutritional needs, improve pregnancy outcomes, and foster self-care.

METHODS

The Binti groups used a program implementation approach where the health facility mobilized pregnant women to come for antenatal care on a set date. Later, the women are categorized by age to join Mama -above 25years or Binti-below 24years groups. Each group is given the same return dates for consecutive visits. The adolescent and youth will join the Binti groups and during each month they visit the health facility together where the health workers provide the antenatal services and monitoring and later counsel the women in a group setting providing a free space for learning and consulting. Binti groups utilize a peer-centered approach, integrating antenatal care services with tailored education sessions on maternal nutrition, infant care, and psychosocial well-being. Through participatory learning techniques these groups address barriers to health-seeking behaviors while fostering a sense of community and resilience. These is complemented by support for kitchen gardens and village savings to empower the women.

RESULTS

Findings from two sampled health facilities that started implementing ANC groups in Jan 2023 demonstrated a 59% increase in number of women completing 4 ANC visits and 5% increase in skilled delivery by June 2024. Anecdotal findings indicate that Binti groups improves early attendance and adherence to antenatal care, increase knowledge on diet and improve self-care among the women. By creating a supportive environment, these groups also mitigate stigma and isolation often experienced by pregnant adolescnts.

CONCLUSIONS

Using Binti groups has improved adherence and early attendance to ANC and therefore receiving prenatal supplements early. The groups also provide a safe space for learning good nutrition overall health and preparation for motherhood. Future efforts should focus on scaling up these interventions, integrating them into national ANC frameworks, and assessing their long-term impact on maternal and infant health outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP49_03

FOOD DATABASE REMAINS THE MOST CHALLENGING FOR THE AI-APPLIED NUTRITION CONSULTATION SYSTEM IN DIETARY INTAKE MEASUREMENT AND MEAL PLANNING

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BACKGROUND AND OBJECTIVES

The rapid advancements in artificial intelligence (AI) have paved the way for innovative healthcare solutions, particularly in low- and middle-income countries. This study was to develop the first-ever AI-powered nutrition consultation system in Vietnam.

METHODS

A database of food and meals (1500 food and meals) and anthropometry (over 100,000 records) and a knowledge base on community nutrition and dietetics were developed to design a smart system (an app) to monitor and provide nutritional consultation to communities and patients with overweight, obesity, undernutrition, hypertension, and diabetes in the country. A trial was conducted on approximately 6,000 community users and 4,290 consultations in 4 hospitals. The community users were instructed to access and obtain nutrition consultations from the app. Hospital health workers were trained to utilize the app in their routine health examination and consultation process.

RESULTS

The app was assessed to be accurate and suitable for the participants. The responding time was mainly acceptable, and the general interface was friendly and easy to use. The app provided hypertension levels, assessed nutrition-related disorders, measured dietary intake, and made meal planning for 100% of participants, with 33.3% at a good level and 60% at a fair level. 86.7% of health workers agreed that the app was effective and helpful for their work. The most challenging function was meal planning. Initial evaluations indicate significant potential for improving healthcare outcomes, enhancing patient education, and fostering proactive health management in communities.

CONCLUSIONS

This study highlights the transformative role of AI in addressing challenges in personal health monitoring. It is recommended to enrich the food and meal database to improve the efficacy of the app in healthy meal planning and nutrition consultation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP49_04

NUTRIENT COMPOSITION OF PLANT-BASED MILK ALTERNATIVES COMPARED TO COW'S MILK

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BACKGROUND AND OBJECTIVES

The world is confronted with two significant challenges: various forms of malnutrition (hunger, obesity, and micronutrient deficiencies) and the rapid depletion of environmental and natural resources. This situation highlights the urgent need for environmentally sustainable diets and conducive to better health. However, there is currently insufficient evidence supporting the nutritional adequacy of plant-based diets. Additionally, research on the environmental impacts of plant-based diets is limited compared to the extensive studies on other food products, like dairy, which have more established life cycle assessments. A healthy diet does not necessarily equate to a lower carbon footprint, and an environmentally sustainable diet is not inherently healthy. Plant-based diets are not conclusively more sustainable and healthier than animal-based diets, and substitutions can sometimes yield unexpected RESULTS. The study aims to determine the nutrient composition of plant-based milk alternatives (PBMA) in the South African retail market and compare it to cow's milk, lactose-free milk, and front-of-pack-label nutrient values.

METHODS

For this analysis, a total of 60 PBMAs and 45 UHT cow's milk product samples were selected. To ensure a representative sample from different batches, the same brands of PBMAs and cow's milk products with three different production dates were chosen. The samples were analysed for moisture, ash, fat, protein, dietary fibre, carbohydrate and mineral content, in duplicate by an accredited laboratory.

RESULTS

The energy content of PBMAs is lower than the energy content of cow's milk, except for coconut PBMA. Except for soy PBMA, the rest of the PBMAs present a low protein and fat content. Except for the unsweetened soy and almond PBMA, the rest of the PBMAs have a high sugar content. Regarding minerals and vitamins, some PBMAs present equal or even higher contents than cow's milk, but bioavailability and absorption of nutrients may be compromised due to the presence of bioactive compounds or antinutrients in PBMAs.

CONCLUSIONS

It is evident that PBMAs are not a replacement for cow's milk and that cow's milk is higher in nutritional value. With fortification, PBMAs can be consumed as a cow's milk alternative, and although not the same as cow's milk, it can also be part of a healthy diet.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP49_05

Multiple Micronutrient Supplementation Adherence During Pregnancy in Nepal: RESULTS from the Non-inferiority Assessment of Maternal Adherence to Supplementation: A Trial on the Effects of MMS (NAMASTE-MMS)

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BACKGROUND AND OBJECTIVES

Due to micronutrient deficiencies, Nepal faces significant maternal and neonatal health challenges. To improve health outcomes, the Government of Nepal (GoN) intends to transition from iron and folic acid (IFA) to multiple micronutrient supplementation (MMS) for pregnant and postpartum women. To support the GoN, several mixed-METHODS implementation research studies are examining questions regarding adherence and acceptability, health system readiness, policy and logistical challenges of implementing MMS at scale. One of the studies is a three-armed randomized controlled trial known as NAMASTE-MMS.

METHODS

NAMASTE-MMS is being conducted in one of Nepal's seven provinces, Lumbini. A prospective cohort of 2,640 pregnant women across 120 facilities are being assigned to one of three arms: 1) IFA blister, MMS blister, or MMS bottle. The primary outcome is non-inferior adherence, measured via pill counts, to 180 tablets of MMS versus 180 tablets of IFA during pregnancy. Mixed-effects logistics and linear regression models will be used to estimate differences in adherence rates between the groups, with an a priori determined non-inferiority margin of 15%. Secondary outcomes include adherence to MMS at other time points (30-day, 90-day, and 45-days post-partum), as well as acceptance of the supplementation and its distribution (bottle vs. blister). The study received ethical approval from the Nepal Health Research Council.

RESULTS

As of January 24 2025, the enrolment for 2,640 pregnant women has been completed and 2,074 and 1,452 completed their 30- and 90-day follow-up data collection points, respectively. Data collection for the 180-day time point is planned for January through July 2025, at which point RESULTS for the primary outcome will be available.

CONCLUSIONS

RESULTS from this study will provide insights into MMS adherence and acceptability patterns across different supplement packaging at key points during pregnancy. This finding will be complemented by small-sample, quantitative demonstration studies in Nepal's other six provinces, as well as qualitative data from all seven provinces, including a supply readiness assessment and validation studies being conducted in collaboration with John Hopkins University. Together these study findings will provide evidence to GoN to inform its transition from IFA to MMS in Nepal while also contributing to the global knowledge base on MMS implementation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP49_06

RELATIONSHIP BETWEEN IMPLEMENTATION OF PROVISIONS OF THE INTERNATIONAL CODE OF MARKETING OF BREAST-MILK SUBSTITUTES AND MATERNITY PROTECTION AND EXPENDITURE OF COMMERCIAL MILK FORMULA IN EAST ASIA PACIFIC

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BACKGROUND AND OBJECTIVES

The rise of commercial milk formulas (CMF) in the diets of infants and young children raises concern for their health, growth and development. Adoption and monitoring of the International Code of Marketing of Breast-milk Substitutes (the Code) and enacting maternity protection policies at the national level are two of seven critical actions for governments to protect breastfeeding. This study explores the implementation of the Code, maternity protection policies, and the expenditure on CMF in major economies in the East Asia Pacific (EAP) region, as well as determines their associations.

METHODS

Data from 11 countries and one special administrative region in the EAP region were collected and analysed. Descriptive statistics were used to assess the implementation of Code provisions and maternity protection policies in EAP countries and CMF expenditures at the global, regional, and national levels. Regression analyses explored associations between CMF expenditures and the status of the policies, including Code implementation, the scope of CMF products covered under national measures, and the duration of paid maternity leave.

RESULTS

CMF expenditures in EAP have surpassed the global average, contributing to 63% of global expenditures, with toddler formula as the highest-selling category. Sales and per capita expenditures of most CMF types have increased in most countries in the region. Japan and Malaysia have no Code-related legal measures. Australia, New Zealand, and Singapore now have Code-related legal measures where previously found to have none. However, CMF marketing regulations in Australia and New Zealand remain largely voluntary in nature. Just over half (7/12) of countries provide the minimum maternity protection entitlements based on ILO standards. As total scores on the Code implementation increased, per capita CMF expenditure decreased. Most countries with high overall expenditures had no legal measures for the Code. The Philippines, with the highest Code implementation score, showed the lowest per capita expenditure. No significant association was found between CMF expenditures and paid maternity leave duration.

CONCLUSIONS

Overall expenditures on CMF are high, with increasing trends in EAP economies, and this is associated with insufficient implementation of the Code. It is critical to adopt legal measures to give full effect to the Code, including bringing CMF scope to at least 36 months to reduce CMF consumption, strengthen comprehensive maternity protection policies, and cultivate intersectoral policy environments to protect, promote, and support breastfeeding.

CONFLICTS OF INTERESTS

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OAP49_07

TOWARDS HEALTHIER AND MORE ENVIRONMENTALLY SUSTAINABLE DIETS IN ICELAND: A PRELIMINARY APPLICATION OF A FIVE-STEP FRAMEWORK FOR SUSTAINABLE FOOD-BASED DIETARY GUIDELINES

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BACKGROUND AND OBJECTIVES

Food-based dietary guidelines (FBDGs) aim to promote healthy diets and inform public policies, such as the new Nordic dietary recommendations which were published in 2023 (NNR2023). However, country-specific adaptations regarding food traditions and regional environmental impacts are encouraged. Thus, this study applied a five-step framework to create FBDGs for Iceland that prioritize health and align with planetary boundaries.

METHODS

The 2014 Icelandic FBDGs were used as the baseline diet as well as a Nordic archetype diet and the current food consumption, gathered from the FAO food balance sheets (an aggregated mean of 2020-2022). Criteria for healthy diets were based on FBDGs, and macro- and micronutrients according to NNR2023. Included environmental impact indicators were greenhouse gas emissions, cropland use, nitrogen and phosphorus application, water use, and species extinction rate which were assessed through Life Cycle Assessment (LCA) studies. In this first run, LCA RESULTS from similar neighboring countries were used. Currently, we are adapting available Icelandic life cycle assessment data for animal food systems to the methodology used in the framework. The EAT-Lancet commission boundaries were used for included environmental impacts, scaled down to the individual level. Detailed methodology of the framework is described in Wood et al. (2023)

RESULTS

Initial analysis showed that for the nutrition assessment, the baseline diet exceeded the caloric limit and was deficient in monounsaturated fatty acids. However, all the nutrient criteria was met after adjustments (i.e., reducing grain and butter intake, and increasing unsaturated fats). The healthy diet exceeded most environmental boundaries except for freshwater use. Moreover, red meat, dairy, and crustaceans were responsible for the highest environmental pressure on the selected impact categories.

CONCLUSIONS

Current FBDGs have high environmental pressure, except for freshwater use. The first run of this study stresses the importance of integrating both health and environmental criteria when implementing new FBDGs. Next steps include altering the baseline diet to create a foundation for healthier and more sustainable food-based dietary guidelines for Iceland.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP49_08

NAVIGATING NUTRITIONAL CHALLENGES AND OPPORTUNITIES IN SCHOOL FOOD PROGRAMS: ALIGNING PRACTICES WITH DIETARY RECOMMENDATIONS

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BACKGROUND AND OBJECTIVES

School food programs (SFPs) serve a critical function in promoting child nutrition, particularly when structured in accordance with national dietary guidelines. In Canada, adherence to Canada's Food Guide (CFG) and provincial nutrition standards is a priority for the National School Food Policy, yet operational constraints and resource variability pose challenges to achieving existing nutritional standards, if present. This study explores the practices, challenges and opportunities faced by school food coordinators in adherence to dietary recommendations.

METHODS

A cross-sectional survey was conducted among 36 school food coordinators across three of Canada's largest school boards located in Ontario. The survey assessed food selection practices, adherence to CFG, the frequency of offering healthy and less healthy food items in alignment with provincial nutrition standards, and challenges in implementing nutritional policies. Quantitative data were analyzed using descriptive statistics, while qualitative responses provided contextual insights into operational practices.

RESULTS

Most programs (63%) reported serving healthy options daily, emphasizing fruits, whole grains, and protein foods such as dairy and eggs. However, vegetables were less frequently represented compared to fruits, and plant-based proteins were underutilized. Approximately 66% of programs avoided selling high-fat, high-sugar, and high-sodium items, but variability in offering "Sell Less" items was observed, with 8% serving them daily. Reliance on prepackaged and processed foods was common due to operational simplicity and resource constraints, with portion sizes often determined by manufacturers. Programs demonstrated variability in serving sizes, accommodating diverse student appetites, and efforts to manage food waste. Challenges included limited resources, reliance on prepackaging, and gaps in specific guidance from CFG and existing school food nutrition guidelines.

CONCLUSIONS

SFPs in Ontario exhibit strong efforts to align with CFG through consistent provision of healthy options and limited availability of less healthy items. However, variability in practices and reliance on processed foods underscore the need for enhanced resources, clearer school-specific CFG guidance, and greater focus on fresh, minimally processed foods, particularly vegetables and plant-based proteins. Addressing these challenges through targeted policy support and improved resource allocation can ensure equitable and consistent adherence to dietary recommendations and improve SFPs' nutritional impact.

CONFLICTS OF INTERESTS

This research is a part of the Feeding Kids, Nourishing Minds project, which is funded by the Joannah and Brian Lawson Centre for Child Nutrition, University of Toronto and the unrestricted donation from the President's Choice Children's Charity. PCCC had no role or input in any aspect of the research project. The authors had no financial relationships with any organizations that might have an interest in the presented work in the previous five years; no other relationships or activities that could appear to have influenced the presented work.

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OAP49_09

EXPERT GUIDELINES ON IMPROVING THE QUALITY OF PUBLISHED AQUATIC FOOD NUTRIENT COMPOSITION DATA FOR THEIR INCLUSION IN FCTS, FCDS, AND EVIDENCED BASED NUTRITIONAL PLANS, POLICIES AND PROGRAMMES

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BACKGROUND AND OBJECTIVES

Aquatic foods nutrient compositional data have potential to contribute to the development and implementation of national nutrition plans, policies and programmes. Many countries, especially low & lower-middle-income countries (LLMIC), lack comprehensive analytical data on the nutrient composition of locally consumed foods, including aquatic foods, in their food composition tables or databases (FCTs or FCDs). Although data from journal articles and laboratory reports have potential to address these gaps, they are often unusable due to insufficient detail on key aspects. This expert review and guidelines aim to provide checklists that authors can use when publishing their aquatic food nutrient composition data.

METHODS

The international Community of Practice on Nutrient Composition of Aquatic Foods has reviewed the shortcomings in published aquatic food nutrient composition data and compiled a pragmatic checklist applicable to LLMICs and other countries. In addition, a comprehensive checklist is proposed as a gold standard for further enhancing data quality depending on the capacities of the institutions.

RESULTS

Aquatic food FCT and FCD compilers report that around 75% of the studies are excluded due to unclear data expressions such as incorrect use of dry weight and dry matter definitions. Further, it has been reported that around 90% of publications are missing at least one of the essential food descriptions including scientific name, sample origin, sample year, sample month, wild/farmed, body part, processing, sample preparation, or relative weight. Aiming to prevent future data losses arising from substandard reporting practices, the checklist outlines the key aspects that should be described in a paper/report to ensure their inclusion in robust and locally relevant FCTs and FCDs. In addition, gold standard guidelines show additional actions that may help to improve data quality.

CONCLUSIONS

Adhering to the checklist will enhance the data-quality of published aquatic food nutrient composition data arising from LLMIC research and development sectors. Further, general publication of data adhering to minimum-quality standards will facilitate the end-uses and applications of these data in FCTs, FCDs and

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nutritional research, development and policy decisions that may contribute to several SDGs in LLMICs. The gold standard guidelines on aquatic food nutrient composition data best practices will provide a framework of reference for capable laboratories, research organisations, universities and institutions involved in data collection when looking to enhance the quality of their published data.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 66 - THE FUTURE OF NUTRITION RECOMMENDATIONS

OAP66_01

LONG-TERM EFFECTS OF CHRONIC CONSUMPTION OF SUGARS AND NON-NUTRITIVE SWEETENERS ON DECISION-MAKING

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BACKGROUND AND OBJECTIVES

Non-nutritive sweeteners, such as aspartame and acesulfame-K, are often used as substitutes for simple sugars to improve the taste of food products without increasing their sugar and calorie content. According to a recent study conducted on adult mice, continuous consumption of low doses of sucrose and saccharin significantly alters dopamine levels in the prefrontal cortex and the striatum, which may modify decision-making strategies during food-seeking tasks, in the absence of any metabolic changes. However, the impact of non-nutritive sweeteners on cerebral and cognitive functions remains poorly studied in humans. One of the aims of the SweetBrainDev project is to explore the effects of chronic consumption of non-nutritive sweeteners on decision-making in healthy young adults. This project aims to establish upper limits on non-nutritive sweeteners consumption in the long term.

METHODS

201 young, healthy adults, aged between 18 and 30 years, categorized according to their consumption of sweeteners using a quantitative food frequency questionnaire, were subjected to computerized cognitive tasks. These tasks assessed uncertainty management, risk-taking, altruism and cooperation levels, and emotion regulation. The data from 173 participants were analyzed using logistic regression and ANCOVA tests.

RESULTS

High consumers of non-nutritive sweeteners maximize their expectations of gains and prefer options where the probability of losing large gains is less frequent in uncertain situations, compared to non and low consumers. Moreover, high consumers favor higher-risk options in risk-taking situations, whereas non and low consumers prefer more prudent options. Daily sugar consumption also has a significant impact on the management of uncertainty, risk-taking, and emotional regulation strategies among young participants.

CONCLUSIONS

Our preliminary RESULTS highlight the potential correlation between the chronic consumption of non-nutritive sweeteners and sensitivity to gains and losses during uncertainty management tasks, as well as risk-taking behavior.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP66_02

THE HEALTH EFFECTS OF MICRO-VEGETABLE CONSUMPTION: A SYSTEMATIC REVIEW OF IN-VITRO AND IN-VIVO STUDIES

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BACKGROUND AND OBJECTIVES

Climate change and soil depletion are altering the nutritional value of fruit/vegetable crops (1). Micro-vegetables (MV) have tightly controlled resource-efficient production requirements (2, 3) and may represent part of the solution. MV have a greater concentration of phytochemicals and vitamins compared to their mature counterparts (4, 5) and have potential for the prevention of malnutrition and non-communicable diseases. These properties have yet to be examined in humans, but experimental in-vitro and in-vivo studies have shown MV can exert a range of effects that are associated with positive health outcomes. The aim of this review was to systematically gather relevant literature on MV and assess their therapeutic potential for human health.

METHODS

The protocol of this review was prospectively registered on the Open Science Framework (6). The research question was formulated as "what are the potential health properties of MV?". This question was refined using the 'PICOS' acronym: Population (P), animal (non-human) or in-vitro experiments; Intervention (I), MV; Comparator (C), control group or a positive/negative control (in-vitro) experiments; Outcome (O), health property, including but not limited to antioxidant, anti-inflammatory, anti-proliferative or metabolic effects; Study type (S), in-vivo or in-vitro.

RESULTS

Following initial searches and removal of duplicates, 2268 articles were screened by reviewing title or abstracts, of which 28 articles fulfilled the inclusion criteria. Twelve articles investigated MV direct antioxidant capacity via in-vitro assays; few studies (n=5) investigated the more physiologically relevant impact of MV on endogenous cellular antioxidant systems. Three murine in-vivo studies demonstrated anti-inflammatory effects of MV supplementation and suggest these effects may be dose-dependent. MV exhibited pro-apoptotic effects in immortalised cell lines. Limited in-vivo animal evidence suggests MV exert lipid and gut microbiota-modifying effects.

CONCLUSIONS

This systematic review provides evidence that MV consumption may have potential benefits for human health. Further, this review signposts outcomes that should be prioritised in human clinical trials; those at cardiometabolic risk are a priority population for such work.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP66_03

ARE SUSTAINABLE DIETS GOOD FOR OUR METABOLIC HEALTH? EXPLORING PHENOTYPIC RESPONSE TO THE MYPLANETDIET RCT

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BACKGROUND AND OBJECTIVES

Sustainable healthy diets are expected to deliver improved environmental and metabolic health, but there is a lack of intervention studies testing the effectiveness and acceptability of such diets [1-3]. At the same time, individuals respond differently to the same dietary change due to a myriad of interpersonal factors, including metabolic status or metabolic phenotype [4]. The aim of this work is to better understand diet-related outcomes and metabolic response to more sustainable diets using a phenotyping approach.

METHODS

The MyPlanetDiet RCT recruited healthy adults following diets with moderate-to-high greenhouse gas emissions (GHGE) to receive either personalised feedback based on a sustainable diet (intervention) or based on Healthy Eating Guidelines (control) for 12 weeks [5]. Dietary assessments (24-hour recalls), fasting serum samples (clinical chemistry), and fasting anthropometry were collected at baseline and endpoint. Participants were grouped using *k*-means clustering based on baseline concentrations total-cholesterol, HDL-cholesterol, glucose, and triacylglyerols (TAGs) to assess metabolic response during the study. Changes in dietary intakes and metabolic biomarkers were compared over time and between groups using two-way mixed analysis of covariance using IBM SPSS statistics (Version 29).

RESULTS

Participants (n=292) had significantly lower diet-related GHGE and higher diet quality at the end of the study. While no significant changes in metabolic health were observed in the full sample population, two of the metabolic phenotypes identified exhibited positive metabolic response during the study. The metabolic phenotypes had significantly different demographic and metabolic-related biomarkers but similar dietary intakes at baseline. In the two responsive phenotypes, there were significant decreases in total-cholesterol, TAGs, body mass index, and waist circumference over time. Response within metabolic phenotypes differed depending on food intake and intervention groups.

CONCLUSIONS

A more sustainable diet is achievable with no negative health effects at least in the short-term and positive metabolic health outcomes for sub-groups with distinct metabolic phenotypes. This work can inform future dietary advice for both more sustainable diets and for interventions aimed at improving metabolic health using metabolic phenotyping.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP66_04

A LITERATURE-BASED DATA SCANNING AND PRIORITISATION STUDY TO GUIDE SYSTEMATIC LITERATURE REVIEWS FOR EVIDENCE-BASED CANCER PREVENTION RECOMMENDATIONS

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BACKGROUND AND OBJECTIVES

In 2018, the World Cancer Research Fund (WCRF) and the American Institute for Cancer Research (AICR) published the Third Expert Report (TER) investigating the links between diet, adiposity, physical activity, and the risk of 19 cancers. This report included 10 evidence-based cancer prevention recommendations (1). Since then, new epidemiological findings may provide additional insights that could expand or refine these recommendations. As part of WCRF International's Global Cancer Update Programme (CUP Global) (2), we aimed to identify the next systematic literature reviews (SLRs) to conduct as research priorities.

METHODS

We developed a prioritisation strategy comprising six actions, which was used alongside expert opinions to determine the next SLRs. We scanned PubMed for 1) meta- and pooled analyses, 2) randomised controlled trials (RCTs) and protocols, 3) Mendelian randomisation (MR) studies, and 4) prospective cohort studies (≥100,000 participants) on diet, adiposity, physical activity, sedentary behaviour and cancer risk published after the TER. In action 5, we utilised the fail-safe number and conditional power statistics to estimate the number of additional studies needed to change the TER meta-analytic findings (3-5). In action 6, which integrated data from actions 1-5, we constructed an exposure-based prioritisation score (PS) across all cancer sites, with points awarded or penalised after assessing the number of new studies, the concordance of association measures (direction and statistical significance) against the TER, and the volume of new associations not covered in the TER.

RESULTS

Information covering 151 exposures and 28 cancers from 366 meta-analyses, 121 pooled analyses, 19 RCTs, 368 MR studies and 359 large cohort studies were compared against those from the 1371 meta-analyses in the TER. Most associations observed in the TER are unlikely to change with the few additional new studies identified in contrast to the estimated number of studies needed to change these findings. The median PS score across exposures was 6 (range -11 to 163). Amongst the top-ranking exposures and identified research priorities were sedentary behaviour (PS 64), tea (PS 36), soy (PS 24), isoflavones (PS 23), and soft drinks (PS 22). Although coffee ranked lower (PS 11), its inconsistent association with various cancer sites warrants investigation. In addition, ultra-processed foods are a new research focus and public health priority also selected for review (6).

CONCLUSIONS

The proposed prioritisation strategy helps target SLRs that would most usefully contribute to CUP Global evidence-based cancer prevention recommendations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP66_06

THE EFFECT OF N-ACETYLCYSTEINE SUPPLEMENTATION ON SPORTS PERFORMANCE IN AMATEUR ENDURANCE ATHLETES

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BACKGROUND AND OBJECTIVES

N-acetylcysteine (NAC) serves as a cysteine donor and supports the synthesis of glutathione, a key antioxidant that neutralizes free radicals. Elevated levels of these reactive molecules are common during and after high-intensity endurance exercise, potentially leading to prolonged muscle soreness and reduced performance in subsequent training sessions. This study aimed to evaluate the efficacy of NAC supplementation in mitigating performance decline during high-intensity endurance tests, particularly in scenarios with short recovery periods.

METHODS

This double-blind, randomized, placebo-controlled crossover study involved 77 participants (41 long-distance runners and 36 cyclists; 20 females and 57 males). Participants completed two endurance tests: the Wingate Anaerobic Test (WAnT) to assess peak power (PP), relative peak power (PP/kg), average power (AP), and relative average power (AP/kg), as well as a sixty-minute time trial (60TT), in which distance covered was the primary outcome. Following baseline testing, participants received a seven-day supply of either NAC or placebo. The tests were repeated after the supplementation. After a three-week washout period, the protocol was repeated with the alternate condition.

RESULTS

No significant time × treatment interactions were observed for 60TT distance in cyclists ($p = 0.238$) or runners ($p = 0.241$). NAC supplementation did not significantly affect PP (cyclists: $p = 0.637$; runners: $p = 0.196$), PP/kg (cyclists: $p = 0.581$; runners: $p = 0.419$), AP (cyclists: $p = 0.988$; runners: $p = 0.222$), or AP/kg (cyclists: $p = 0.637$; runners: $p = 0.078$).

CONCLUSIONS

NAC supplementation has no significant effect on performance in either the WAnT or 60TT across endurance-trained athletes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP66_07

ADHERENCE TO THE NEW NORDIC NUTRITION RECOMMENDATIONS FOR ANIMAL-BASED FOOD GROUPS BY EDUCATION LEVEL IN FINNISH ADULTS

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BACKGROUND AND OBJECTIVES

The new food-based dietary guidelines (FBDG) included Nordic Nutrition Recommendations (NNR) 2023 set updated targets for the consumption of red and processed meat, fish, and dairy. While adherence to the FBDG is generally low in adults, the role of background factors associated with adherence are less examined. Our aim was to examine the proportion of Finnish men and women meeting the guidelines for animal-based foods focusing the association between education and adherence.

METHODS

The data included 780 men and 875 women (aged 18–74 years) from the national FinDiet 2017 Survey. Dietary data was collected with two non-consecutive 24-h dietary recalls. The National Cancer Institute (NCI) method was used for modelling usual intake distributions of red and processed meat, fish and fish product, and milk and milk products (as milk equivalents). Then, the proportions of men and women in different education groups meeting the FBDG (≤50 g/day, 350-500 ml/day, and 43-64 g/day, respectively) were assessed. Education level was determined by asking participants' total number of school years. These were categorised into tertiles (low, middle, high) according to sex and birth year.

RESULTS

In men, 7% met the target for red and processed meat, 16% for fish, and 11% for milk. In women, the proportions were 31%, 12%, and 20% respectively. When analyzed by education level, both men and women in the highest education group were more likely to meet the target for red and processed meat (men: 16%; women: 44%) compared to those in the lowest education group (men: 5%; women: 19%). Furthermore, in women, a higher proportion in the highest education group (19%) met the target for fish compared to those in the lowest education group (6%). In contrast, adherence to the target for fish did not appear to differ between education groups in men, nor did adherence to the target for dairy in either men or women.

CONCLUSIONS

In general, adherence to the NNR 2023 FBDG for animal-based food groups is generally low in Finnish adults. Although higher education level tended to be associated with better adherence especially for red and processed meat, effective implementation of guidelines is crucial across all population groups. However, the influence of education should be carefully considered in future implementation efforts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP66_08

REEVALUATING DAIRY FAT: EMERGING EVIDENCE ON THE HEALTH BENEFITS OF FULL-FAT DAIRY AND THE ROLE OF MILK FAT GLOBULE MEMBRANE ON POSTPRANDIAL LIPEMIA AND CARDIOVASCULAR HEALTH

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BACKGROUND AND OBJECTIVES

Since the 2000s, research suggests that regular-fat dairy foods may not be associated with adverse cardiometabolic health effects. The objective of this review is to update the scientific community on the latest advances in our understanding of the specific composition and structure of milk fat in dairy products, particularly the Milk Fat Globule Membrane (MFGM), and their role in cardiometabolic health. This work aims to contribute to the reevaluation of the place of regular-fat dairy in recommendations for healthy diets.

METHODS

Relevant publications from peer reviewed journals, including food science articles, epidemiological studies, randomized controlled trials, reviews, and meta-analyses from the last decade, were selected and examined to update knowledge on milk fat composition and structure and relevant evidence about the effects of dairy fats and whole-fat dairy consumption on cardiometabolic health. Translational and mechanistic studies, particularly those related to the MFGM, were summarized to explore potential underlying mechanisms.

RESULTS

The specific fat globule structure and the unique, diverse, molecular composition of milk fat (over 400 types of fatty acids; various polar lipids of the MFGM) is highlighted. In cohort studies, dairy fat intake has been associated with a lower risk of type 2 diabetes and has shown to be inversely associated with adiposity and weight gain. Epidemiological studies support neutral to beneficial associations of total or whole-fat dairy intake with lipid metabolism and body weight. Recent research introduces how the matrix of dairy products (e.g., cheese, yogurt vs butter) plays a role in modulating the physiological responses to fat intake. Intervention studies demonstrate positive effects of the cheese matrix, e.g. on reducing postprandial lipemia, increasing HDL cholesterol and inducing less atherogenic LDL particles. Among potential mechanisms (e.g., calcium, fermentation), recent advances suggest benefits of milk polar lipids/MFGM on lipid digestion and absorption, reduction of lipid markers of cardiovascular risk, and potential benefits on metabolic inflammation via modulations of the gut microbiome and of circulating sphingolipids.

CONCLUSIONS

The specific composition and structure of milk lipids within the matrix of full-fat dairy products impacts digestion and absorption and is associated with evidence of neutral to beneficial cardiometabolic health outcomes. This warrants better consideration of whole-fat dairy in nutrition recommendations, and further research to decipher mechanisms of the health impact of the different dairy fat sources and whole-fat dairy matrixes.

CONFLICTS OF INTERESTS

Literature review research contract (via author's institution) with Danone ResearchOther research partnership/contracts (via author's institution) with CNIEL and Sodiaal-Candia R&I

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OAP66_09

A SYSTEMATIC REVIEW OF NUTRIENT PROFILING MODELS THAT PROMOTE A HEALTHY DIET

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BACKGROUND AND OBJECTIVES

Over the past two decades, the field of nutrient profiling, which involves classifying or ranking foods based on their nutritional content, has expanded significantly in relation to the prevention of non-communicable diseases and the promotion of health. Many nutrient profile models (NPMs) focus heavily on the nutrients to limit. Such NPMs can play an important role e.g., traffic light labelling to enable quicker purchasing decisions; however, they fall short in helping individuals establish a healthy diet. Recently, the FAO/WHO[1] has introduced a definition of a healthy diet grounded in four principles: adequacy, diversity, moderation, and balance. Our objective was to identify NPMs that incorporate these principles

METHODS

A systematic literature review was conducted across three databases (PubMed, Scopus, and Cochrane Library) in July 2024 to identify NPMs referenced in peer-reviewed journals. We then assessed which of these models align with the newly defined concept of a healthy diet. NPMs that were limited to single product categories or specific populations were excluded from consideration.

RESULTS

Our search identified 203 studies that cited 119 unique NPMs or included a validation study related to one of these. After applying our criteria focused on the four principles of a healthy diet (i.e., adequacy, diversity, moderation, and balance), we identified eight NPMs that meet these standards. The models include the Canadian Food Scoring System, Carbohydrate Food Quality Score, Diabetes Canada Clinical Practice NPM, EU Pledge Nutrition Criteria, Food Compass, Keyhole, NutriScore, and Singapore Healthier Choice.

CONCLUSIONS

We identified only eight NPMs that effectively consider the four principles of a healthy diet. Among these principles, the balance of macronutrients was the least frequently represented. Although numerous NPMs account for adequacy of protein and fiber, the adequacy of micronutrients is rarely addressed, with only two out of eight models evaluating more than one micronutrient. This review highlights that there are few NPM that translate FAO/WHO guidelines for a healthy diet into product specific criteria, helping public health stakeholders identify NPM with global relevance i.e. including micronutrient adequacy, macronutrient balance as well as food group diversity.

CONFLICTS OF INTERESTS

All authors are employees of Nestlé Research. Nestlé was not involved in the study, analysis, interpretation of data or the writing of this abstract or the decision to submit it for publication. All authors declare no other competing interest.

1. PROSPERO Registration number: CRD42024574722

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OAP 12 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

OAP12_01

FOOD-BASED DIETARY GUIDELINES FOR CHILDREN AND ADOLESCENTS AND PLANETARY HEALTH: UPDATE OF THE OPTIMIZED MIXED DIET

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BACKGROUND AND OBJECTIVES

Introduction/ Objective: As the global climate crisis requires a paradigm shift in dietary concepts, a global reference diet has been suggested by the EAT-Lancet Commission. On this basis, the detailed "Planetary Health Diet Index" (PHDI) has been proposed. In Germany, Food Based Dietary Guidelines (FBDG) for children and adolescents named "Optimized Mixed Diet" (OMD) have been in existence since about 30 years. The OMD is based on a 7-day menu that prefers customary food and dietary habits of German families, with 5 meals per day (3 main meals, 2 snacks). The aim of this evaluation is 1) to apply the PHDI to the OMD in its original composition and 2) to examine how the planetary value of the OMD could be improved by changing the food selection while respecting the special needs of children.

METHODS

METHODS: The PHDI of the original OMD was calculated by assigning the foods of the 7-day menu to the PHDI food groups in order to score them. The diet was then updated by either reducing or increasing individual foods from these food groups in the meals (always respecting practicability and age-specific nutritional needs) resulting in an improved PHDI. To calculate the energy and nutrients intake of both OMD versions, a common software was used. Nutrient values were obtained from the German Food Code and Nutrient Data Base.

RESULTS

The original OMD obtained a PHDI score of 68.2 points, representing 45.5% of the theoretical maximum of 150 points. The updated OMD resulted in increased consumption of 'nuts & peanuts', 'legumes', 'green vegetables', 'whole grains', and decreased consumption of 'tubers & potatoes' and 'red meat'. Overall, the PHDI increased from 68.2 to 81.5 points with the updated OMD, reflecting a 13.3% increase compared to the original diet. Nutrient densities remained high and increased for some nutrients.

CONCLUSIONS

The examination of the current OMD with the PHDI has confirmed that this dietary concept, which is preventive from the ground up, is already quite sustainable. This evaluation is not surprising, because the OMD is based on three simple rules for food selection which are to consume beverages and plant-based foods generously, animal-based foods moderately and high-fat, high-sugar foods sparingly. Furthermore, the OMD focuses on home-cooked meals and therefore limits the use of highly processed foods in line with the sustainability criteria. By applying the PHDI, the sustainability of the original OMD was further improved through a few but targeted changes in individual food groups that can be easily implemented in practice while maintaining high nutrient densities and acceptability for children.

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OAP12_02

THE POTENTIAL OF CLIMATE CHANGE MENU LABELS TO PROMOTE HEALTHY AND SUSTAINABLE DIETS

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BACKGROUND AND OBJECTIVES

In the United States and many other high-income countries, current dietary patterns drive high and growing rates of diet-related chronic diseases and also contribute to climate change. Climate change is an urgent public health threat and reducing food systems-related greenhouse gas emissions (GHGE), which contribute one-third of all GHGE could make a significant impact. Menu labels conveying the GHGE of menu items may be a key strategy to help educate and inform consumers about the climate impacts of their food choices. Climate change menu labels may encourage healthier food choices as well.

METHODS

In this presentation, we will provide an overview of existing evidence of the effectiveness of different climate label designs in promoting healthier and more sustainable food choices. We will highlight RESULTS from two recent studies: one conducted in a university setting in which climate labels were displayed in two dining halls for a four-week period and compared to baseline, and a large online experiment in which ~6000 participants were randomized to view a fast food restaurant menu with one of four climate label designs vs. a control (QR code) label. For the dining hall climate label study, students (n=186) who frequented the dining hall reported their dietary intake using the Prime Diet Quality Screener at baseline and post-intervention via an online survey.

RESULTS

The presentation will describe the process used to estimate the GHGEs of menu items for both studies. The presentation will also focus on challenges and lessons learned regarding estimating GHGE for menu items. The dining hall climate label study did not shift students' dietary intake or dining hall procurement in the short term. The online experiment will be conducted in December 2024. We will present the RESULTS of the online experiment comparing the effects of the label designs on the sustainability (GHGE) and healthfulness (calories and Nutrient Profile Index score) of items ordered. Finally, the presentation will discuss public health policy opportunities and challenges related to advancing climate change menu labels as a strategy to promote healthy and sustainable diets.

CONCLUSIONS

Climate change menu labels are a promising strategy for promoting sustainable and healthy dietary patterns. However, numerous challenges to their implementation in research and real-world settings must be considered. The findings discussed in this presentation will be critical for informing research, voluntary industry actions, and policies to advance climate change menu labels that effectively promote healthy and sustainable diets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP12_03

CO-EXPOSURE TO MULTIPLE MYCOTOXINS MAY SYNERGISTICALLY CONTRIBUTE TO COLORECTAL CANCER RISK

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BACKGROUND AND OBJECTIVES

Food safety is a critical global concern, exacerbated by climate change, population growth, and food crises. One major threat to food security and human health, including cancer, is the presence of mycotoxins in food. This study aimed to investigate the association between co-exposure to multiple mycotoxins and the risk of colorectal cancer (CRC).

METHODS

Using validated and standardized dietary questionnaire data from the European Prospective Investigation into Cancer study combined with mycotoxin food occurrence data compiled by the European Food Safety Authority, we investigated the association between co-exposure of multiple mycotoxins and CRC risk in 410, 286 non-cases and 5851 CRC cases. Mycotoxin patterns were derived using principal component analysis with Pearson correlation matrix from 14 mycotoxins. Hazard ratios (HR) and 95% confidence intervals (CI) were estimated using Cox regression models.

RESULTS

Three distinct mycotoxin patterns were identified, which together explained 66.3% of the total variance. The first pattern (explaining 36.3% of variance) comprised of a co-exposure of fusarium (deoxynivalenol and derivatives, fumonisins, diacetoxyscirpenol, T2HT2, nivalenol and zearalenone & derivatives) ochratoxins and aflatoxins; a second pattern (explaining 13.3% of variance) comprised of both genotoxic and non-genotoxic alternaria toxins; and a third component (explaining 9.4% of variance) comprised of a co-exposure of ergot alkaloids and enniatins. After adjusting for potential confounders trend analysis indicated that the patterns were positively associated with CRC risk (1st pattern HR T3vsT1: 2.19, 95%CI: 1.99-2.42; 2nd pattern HR T3vsT1: 1.33, 95%CI: 1.18-1.51; 3rd pattern HR T3vsT1: 1.12, 95%CI: 1.05-1.20).

CONCLUSIONS

Co-exposure to multiple mycotoxins in the fusarium, ochratoxin and aflatoxin groups, as well as enniatins and ergot alkaloids groups may synergistically contribute to CRC risk, one of the most diagnosed cancers in Europe. These findings warrant further confirmation through additional cohort studies and by examining mycotoxin levels in biological samples, such as blood.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP12_04

FACTORS ASSOCIATED WITH SUSTAINABLE DIETARY PATTERNS: A MULTIDIMENSIONAL ASSESSMENT OF PORTUGUESE ADULTS' DIETS

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BACKGROUND AND OBJECTIVES

As current food production and consumption patterns present substantial risks to both human health and the environment, it is essential to identify and better understand the various factors influencing diet sustainability. This study aims to identify factors associated with the sustainability of Portuguese adults' diets.

METHODS

Data from 2287 participants in the National Food, Nutrition, and Physical Activity Survey (IAN-AF 2015-2016) were analyzed. The Diet Sustainability Score (DSS) was derived from four dimensions: nutritional quality, environmental impact, economic affordability, and sociocultural acceptability. Linear regression models examined the effects of sociodemographic, economic, and lifestyle factors on the DSS, adjusting for sex and age. The Kruskal-Wallis test assessed differences in food group consumption across DSS quintiles. Food intake values were standardized to an energy intake of 2200 kcal/day using the energy density method.

RESULTS

The DSS showed positive associations with female gender, older age, higher education, and higher income. Additionally, individuals with higher DSS exhibited healthier lifestyle behaviors, including non-smoking, non-alcohol consumption, higher organic food intake, and less frequent eating out-of-home habits. Participants with higher DSS consumed more vegetables (203 g/day in Q5 vs. 109 g/day in Q1), fruits (322 g/day in Q5 vs. 117 g/day in Q1), fish and seafood (59 g/day in Q5 vs. 30 g/day in Q1), white meat (35 g/day in Q5 vs. 21 g/day in Q1), and olive oil (14 g/day in Q5 vs. 10 g/day in Q1), while consuming less red and processed meat (35 g/day in Q5 vs. 109 g/day in Q1), sweets, sugar-sweetened beverages and salty snacks (70 g/day in Q5 vs. 299 g/day in Q1). These dietary patterns aligned with the Mediterranean dietary guidelines for Portugal.

CONCLUSIONS

The findings highlight key factors influencing diet sustainability and provide insights into the behaviors and characteristics of individuals with more sustainable diets. This study contributes to a better understanding of the multidimensional aspects of sustainable eating and offers valuable information for future research and policy-making aimed at promoting more sustainable food practices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP12_05

EXPLORING THE ASSOCIATION BETWEEN MEDITERRANEAN DIET, SUSTAINABLE EATING, AND ECO-ANXIETY: A CROSS-SECTIONAL STUDY ON FOOD CHOICES

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BACKGROUND AND OBJECTIVES

Sustainable and healthy eating behaviors have gained increasing attention as a vital aspect of public health, particularly in the context of addressing climate change and promoting ecological well-being. At the same time, rising concerns about environmental issues have led to the emergence of eco-anxiety, a psychological response to perceived environmental threats. Understanding how dietary patterns, sustainable eating behaviors, and eco-anxiety intersect can provide valuable insights into developing comprehensive strategies for improving both individual health and environmental sustainability. This study aims to evaluate the relationships between adherence to the Mediterranean diet, sustainable and healthy eating behaviors, and eco-anxiety levels in adults and how plant and animal product preferences affect these levels.

METHODS

This cross-sectional study was conducted with 149 adults (73.8% female, mean age 28.42 ± 7.50 years) between 15 May and 10 December 2024. An online questionnaire including demographic characteristics, the Mediterranean Diet Adherence Scale (MEDAS), the Sustainable and Healthy Eating Behaviors Scale (SHEB), and the Eco-Anxiety Scale (EA) were performed. Additionally, an online market was created featuring two food groups, including plant- and animal-based products (dairy and meat). Participants were asked to select six items, comprising three products from the dairy group and three from the meat group. Data were analyzed using SPSS 24.0.

RESULTS

The majority of the participants (91.9%) showed low compliance with the Mediterranean diet according to the MEDAS classification, and the mean MEDAS score of the participants was 5.02 ± 1.78, which was higher in women than in men and there was a statistical difference between them (p: 0.022). There was a positive moderate correlation between MEDAS and SHEB scores (r: 0.491, p< 0.001), whereas EA scores did not show any correlation between MEDAS, and SHEB. There was a difference between tertiles 1 and 3 and tertiles 2 and 3 in total plant and animal product selection on the SHEB scale (p: 0.043).

CONCLUSIONS

These RESULTS emphasize the need for targeted interventions to promote sustainable and healthy eating behaviors, particularly focusing on increasing Mediterranean diet compliance to support both individual and environmental health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP12_06

ASSOCIATION BETWEEN MINDFUL EATING AND PLANT-BASED DIET: FINDINGS FROM A FRENCH COHORT

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BACKGROUND AND OBJECTIVES

Mindful eating (ME) can be globally defined as paying attention to the eating experience with all the senses, and witnessing the emotional and physical reactions that occur before, during, and after the eating experience without judgment or reaction. Scientific evidence suggests that this concept may be an effective approach to promoting healthy plant-based diets, which offer significant health and environmental benefits. However, there is limited data in the literature regarding the relationship between ME and these diets. This cross-sectional study aimed to investigate the association between ME and adherence to plant-based diets.

METHODS

In 2023, 13,768 participants from a large French web-based cohort completed the Mind-Eat Scale, which assesses total ME and its sub-dimensions, along with at least three 24-hour dietary records, and a food choices questionnaire. The contribution of plant-based foods was evaluated using the Plant-based Diet Index (PDI), the healthy PDI (hPDI), and the unhealthy PDI (uPDI). Participants were classified into 4 groups: higher meat/fish eaters, lower meat/fish eaters, vegetarians, and vegans. Multivariable linear and logistic regressions were performed to analyze the association between ME (independent variable), the PDI, hPDI, and uPDI scores, the proportions of meat and fish in the diet, and the 4 diet groups, considered separately (dependent variables), adjusting for socio-demographic and lifestyle factors.

RESULTS

ME was positively associated with PDI (β=1.19; 95%CI: 0.98, 1.41) and hPDI (β=1.00; 95%CI: 0.76, 1.24), and negatively with uPDI (β=-0.48; 95%CI: -0.70, -0.27), and with meat consumption (β=-0.63; 95%CI: -0.76, -0.50). Individuals with higher levels of ME were more likely to be lower meat/fish eaters (OR=1.25; 95%CI: 1.17, 1.35), vegetarians (OR=1.53.; 95%CI: 1.31, 1.79) or vegans (OR=2.14.; 95%CI: 1.54, 2.99). Most of these associations were consistent across ME sub-dimensions.

CONCLUSIONS

Our study showed that participants with higher levels of ME, were more likely to follow healthy plant-based diets. These findings suggest that ME could be a promising strategy for promoting a shift towards a reduction in animal product consumption, which is a crucial step toward achieving global food sustainability. Longitudinal studies are needed to continue exploring this relationship.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP12_07

BIOAVAILABILITY OF VITAMIN B12 PRODUCED BY PROPIONIBACTERIUM FREUDENREICHII FERMENTATION TO FABA BEAN BREAD: A RANDOMISED CROSS-OVER TRIAL IN HEALTHY VOLUNTEERS

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BACKGROUND AND OBJECTIVES

In Western societies, a dietary shift towards plant-based diets is needed to tackle greenhouse gas emissions and lessen the environmental burden of our current diets. However, vitamin B12, an essential micronutrient for growth and development in children and maintenance of health in adults, is naturally derived only from animal-sourced foods. Therefore, policies to ensure adequate vitamin B12 intake at population level is required. Using precision fermentation with Propionibacterium freudenreichii, we developed faba bean bread (FB bread) enriched with vitamin B12. We conducted a proof-of-concept dietary trial to study whether the vitamin B12 in FB bread is absorbed and available to support B12 status in healthy volunteers.

METHODS

A randomised, controlled, blinded trial with cross-over design was conducted. Healthy adult volunteers were assigned to the following three treatments six times over two days with a 1-week washout between the treatments: 1) FB bread with 5µg of vitamin B12 + placebo tablet; 2) FB control bread without vitamin B12 + tablet with 5µg of vitamin B12; 3) FB control bread + placebo tablet (no vitamin B12). The total dose of vitamin B12 from the bread or tablet was 30µg/2d. Volunteers gave a baseline serum sample after overnight fast, after which they underwent all three treatment periods in random order with a fasting serum sample collected at the end of each period. Total vitamin B12 and holo-transcobalamin (holoTC) were analysed in every sample. Baseline samples were checked for folate, homocysteine, methyl malonic acid, and creatinine. Food intake at baseline and during treatments was assessed by 3-d food records.

RESULTS

Among 20 volunteers completing all 3 treatments, both FB bread enriched with vitamin B12 and vitamin B12 tablet significantly ($p \leq 0.002$) increased the concentration (change pmol/l; mean±SD) of serum holoTC (32.2 ± 25.4 with FB bread; 37.3 ± 20.6 with B12 tablet) in comparison to placebo control (0.20 ± 20.0). The total vitamin B12 concentration was more efficiently increased by vitamin B12 tablet (34.2 ± 36.4; $p=0.004$) even though a trend was seen by FB bread (17.3 ± 32.7; $p=0.27$) in comparison to placebo control (-1.9 ± 23.8).

CONCLUSIONS

Vitamin B12 enriched FB bread significantly increases serum holoTC, the most reliable marker of vitamin B12 status. Our RESULTS demonstrate the potential of precision fermentation to enrich plant-based materials with bioavailable vitamin B12, providing a viable approach to ensure adequate intake of vitamin B12 in shifts towards sustainable diets.

CONFLICTS OF INTERESTS

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OAP12_08

SIMILARITY INDEX (NSI) FOR INTERCHANGING FOOD PRODUCTS: FROM QUALITATIVE CLASSIFICATIONS TO QUANTITATIVE INDICATORS

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BACKGROUND AND OBJECTIVES

Life cycle assessment (LCA) is widely used to assess the environmental impact of food items. Outcomes hereof are often erroneously used for comparison of foods and suggesting replacements based on perceived lower environmental impact of foods, without considering (i) nutritional value of products, and (ii) whether products are interchangeable based on nutrient profiling. In nutritional LCA (nLCA) a nutrition-based, rather than a mass-based, functional unit (FU) in LCA is used. This allows balancing nutritional value and environmental impact, but still does not answer the question whether products are interchangeable. Specifically for this purpose, we designed a Nutrient-based Similarly Index (NSI).

METHODS

To enable quantification of the similarity of food items, a Nutrient-based Similarly Index (NSI) was developed. The basis for the NSI is a so-called cosine similarity index, which considers the nutrient profile of a food product as a vector in an *n*-dimensional space, wherein *n* is the number of nutrients considered in the NSI. The cosine of the angle between the vectors of 2 food products represents the NSI; an NSI of 1 indicates an angle of 0° between vectors (*i.e.*, complete similarity) whereas an NSI of 0 indicates a 90° angle between vectors (*i.e.*, complete dissimilarity). The NSI was calculated for >250 food items based on values of *n* ranging from 6 to 21 nutrients to assess interchangeability of food products within food groups and between food groups.

RESULTS

The NSI values calculated for the set of food products within this study and across the different nutrient spaces (n = 6-21) indicates some critical points. Consideration of a higher number of nutrients improved reliability of comparisons. When looking at NSI values within food groups, particularly high similarity was found within the categories of grain, bread and dairy products, often yielding values >0.8. However, NSI values between dairy products and dairy alternatives were always <0.4. within the category of meat products NSI values were mostly >0.6 whereas meat replacers showed some similarity to some meat products. NSI values within the food groups of vegetables and of fruits were also founds to be highly variable with values ranging from <0.2 to >0.8.

CONCLUSIONS

The NSI provides a relatively easy quantitative approach for comparison based on nutrient profiles of food items. NSI values can form the basis for validating the relevance of comparison of products based on e.g., environmental impact and affordable nutrition.

CONFLICTS OF INTERESTS

S.P. is employed at the Dutch Dairy Association and T.H. is employed by a company that is a member of the Dutch Dairy Association. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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OAP12_09

DOES WATER INSECURITY MEDIATE THE ASSOCIATIONS BETWEEN CLIMATE EVENTS AND FOOD INSECURITY? AN ANALYSIS FROM 25 LOW- AND MIDDLE-INCOME COUNTRIES

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BACKGROUND AND OBJECTIVES

Climate events are increasing in frequency and intensity, with greater floods and droughts projected to disrupt food production and undermine food security (1,2). These events may also lead to water insecurity, which in turn may exacerbate food insecurity by limiting the ability to cook certain foods and practice food hygiene (3). The potential mediating role of experiential water insecurity in the relationship between climate and food insecurity, however, is not well understood.

METHODS

Nationally representative data on individual experiences of food and water insecurity, over the preceding 12 months, were collected from 25 countries through the Gallup World Poll from 2020-21 (4). Respondents' geolocations were spatio-temporally linked to flood and drought events recorded in the EM-DAT database (5) to estimate their exposure to at least one month of that event in the corresponding year. Multivariable multinomial and logistic regression models were run to estimate the associations between these climate events and food and water insecurity. All models were survey-weighted and adjusted for socio-demographic covariates: income, education, urbanicity, climate zone, sex, household size, and age. Mediation analysis was conducted to estimate the role of water insecurity in mediating the association of floods with food insecurity.

RESULTS

Individuals exposed to floods had higher odds of experiencing food insecurity (1.22 OR, 95% CI:1.07-1.39), whereas there was no association found between exposure to droughts and food insecurity (0.88 OR, 95% CI:0.67-1.17). Both floods and droughts were associated with greater odds of experiencing higher water insecurity. Furthermore, water-insecure individuals had 2.8 times higher odds of being food insecure than water-secure individuals (95% CI: 2.50-3.12). The association between flood events and food insecurity was attenuated after adjusting for water insecurity, with preliminary analysis estimating that about 30% of the association was mediated through water insecurity.

CONCLUSIONS

Water and food insecurity were closely associated, and water insecurity was a mechanism through which floods were associated with food insecurity. Addressing water insecurity issues to mitigate the potential risks to food insecurity and its nutritional impacts is imperative. Given that climate events like floods are projected to increase in frequency and intensity, efforts to improve the resilience of water and food systems will be essential to safeguard nutrition in the future.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 14 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

OAP14_01

SOCIAL INTERACTIONS FOR SUSTAINABLE FOOD CHOICES: MEETING THE TARGET FOR MEAT INTAKE IN THE UNITED KINGDOM

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BACKGROUND AND OBJECTIVES

Substantial shifts in contemporary diets are needed to halt the growing burden of chronic diseases and the rapidly accelerating climate crisis. Achieving this will require strong action and use of policy instruments that can aid consumers in making the right dietary choices. Real-life evidence on how to change dietary behaviours within complex food systems at scale demands resources and research that might not be realistic to acquire or realise. This project applied innovative models to predict the dietary and environmental effects of broad-scale strategies designed to transform dietary behaviours among consumers.

METHODS

Scenarios were simulated using agent-based opinion dynamics models to evaluate the impact of different levels of governmental influence on people's consumption of meat, vegetables, pulses, and meat alternatives. We considered the problem of influencing the opinions of a group of agents (representing the UK population) connected in a social network over a sequence of campaigns to achieve convergence to two different targets: achieving the UK Climate Change Committee's goal of a 35% and 50% reduction in population-average meat consumption. The opinion dynamics compromised agents (i.e. consumers), with empirically derived baseline food intake patterns (i.e., initial opinions) and sociodemographic attributes. Changes in environmental impacts following changes in consumption were quantified.

RESULTS

In a scenario of high governmental influence, uniform in the population, achievement of the 35% and 50% meat reduction goals corresponded to approximately 5.2 and 8.1 years, respectively. As meat consumption reduced, the average intake of meat alternatives, pulses, and vegetables increased by 30%, 108%, and 84%, respectively (-35% scenario). Greenhouse gas emissions, land use, water use, and scarcity weighted water use reduced notably in both the -35 and -50 scenarios.

CONCLUSIONS

The findings of this project could provide valuable insights for policy-makers and governmental authorities for developing effective influence strategies aimed at promoting/achieving sustainable dietary habits.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP14_03

ENHANCING RESILIENCE AND LIVELIHOODS FOR VULNERABLE POPULATIONS THROUGH NUCS ADOPTION

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BACKGROUND AND OBJECTIVES

In partnership with SAHARA Nepal, Action Against Hunger Nepal and Belaka Municipality implemented the Food Security and Livelihood (FSL) project. The project aimed to establish a disaster-resilient food system by promoting Nutritionally Undervalued Crops and Species (NUCS), bamboo cultivation, and mushroom farming. The project focused on empowering women, increasing household dietary diversity, and fostering sustainable livelihoods in a region characterized by hilly terrain, food insecurity, and nutritional challenges.

METHODS

An independent evaluation, commissioned by Action Against Hunger, utilized a convergent mixed-METHODS approach. Quantitative data were collected from 229 households through systematic random sampling, focusing on dietary diversity, agricultural practices, and disaster preparedness. Qualitative data came from Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) with stakeholders, including local government officials and farmers. Data analysis employed SPSS for quantitative data and thematic analysis in Excel for qualitative data, ensuring a comprehensive evaluation of project outcomes. The evaluation assessed project performance against OECD/DAC criteria—relevance, coherence, effectiveness, efficiency, impact, and sustainability—while also considering gender, social inclusion, and disability inclusion.

RESULTS

The project achieved significant improvements in awareness and utilization of Neglected and Underutilized Crop Species (NUCS), leading to an increase in household dietary diversity scores from 7.2 to 8.5. However, the impact on women's dietary diversity was less pronounced, highlighting the need for targeted interventions. Despite successful promotion of climate-resilient agricultural practices, challenges included insufficient training follow-up and mismatches between training quality and participant satisfaction. The project's relevance and coherence were rated moderate, with areas for improvement in inclusivity and disaster preparedness. Long-term sustainability remains uncertain due to mixed feedback on the adoption of introduced practices.

CONCLUSIONS

The evaluation emphasized the need for comprehensive training, post-training support, and strategic resource allocation. Key recommendations include water harvesting technologies, ongoing skills support, and integrating food demonstrations in nutrition training. These insights will guide future interventions, enhancing the effectiveness and resilience of food security programs in disaster-prone regions.

CONFLICTS OF INTERESTS

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OAP14_04

COMPREHENSIVE GEOGRAPHIC TARGETING INDEX FOR A MULTI-SECTORAL NUTRITION INITIATIVE IN NEPAL

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BACKGROUND AND OBJECTIVES

Targeted, context-specific interventions for vulnerable groups are essential to improving health and nutrition outcomes for women, children, and adolescents. USAID Integrated Nutrition, an at-scale multi-sectoral initiative in Nepal, used national and subnational data on multiple indicators to develop an index that guided the selection of districts for programmatic targeting. The question, however, is how this method compares with other geographic targeting approaches.

METHODS

USAID Integrated Nutrition's multi-stage district selection involved: 1) ranking districts based on their proportion of municipalities with the highest burden of three indicators: child mortality, literacy, and early marriage; 2) ranking districts based on their proportion of municipalities with the highest burden of 13 multi-sectoral indicators spanning health and nutrition service coverage, household socioeconomic status, climate vulnerability, and more; 3) ranking districts by consulting policymakers and planners to ensure alignment with government priorities and minimize duplication; and 4) constructing a composite index by averaging the ranks from the first three stages to identify the 48 highest ranked districts. USAID Integrated Nutrition conducted overlap assessments and correlation analyses to test variations in the four stages.

RESULTS

The overlap analysis revealed that 56% of the priority districts were consistent across METHODS used in all stages. Comparisons between specific METHODS showed varying degrees of overlap: ranging from 53% to 95%. District selection based on a single approach excludes several vulnerable municipalities; for instance, the first approach excludes *terai* municipalities with a sizeable Muslim population in Lumbini Province, while the second approach overlooks the most marginalized municipalities of Madhesh Province. The moderate-to-high correlation of the fourth approach with the first ($r=0.67$ $p<0.001$), second ($r=0.06$ $p=0.607$), and third approaches ($r=0.89$ $p<0.001$) suggest that the fourth approach effectively captures both development and operational priorities.

CONCLUSIONS

These findings highlight the limitations of using a single method for district selection, as it risks excluding vulnerable communities. A multi-stage approach ensures a more comprehensive selection process, accounting for nutritional, geographic, and socio-economic diversity. To optimize resource allocation and target efforts to achieve nutrition outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP14_05

FOOD ENVIRONMENT RESILIENCE IN THE CONTEXT OF A CHANGING CLIMATE IN CAMBODIA

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BACKGROUND AND OBJECTIVES

Riverine communities living in the Mekong River regions of Cambodia have access to both water-related natural (wild and cultivated) and built food environments that can support their livelihoods, income sources, and consumption of nutrient-rich foods. However, upstream food systems drivers, including climate variability, have the potential to impact the types of food environments that these communities' access, as well as the foods that they can acquire from within them. The objective of this study was to examine how climate variability is influencing access to diverse food environments and the perceived impacts of those changes on food access now and in the future.

METHODS

We conducted semi-structured interviews with women (n=80) living in eight riverine communes in Cambodia along the Mekong River and Tonle Sap lake to better understand the factors influencing their food choice, the food environments they access across seasons, and how climate variability influences their access to food. Interviews were audio-recorded, translated, and transcribed and subsequently coded and organized according to key themes using a conceptual riverine food environment framework previously published by our team.

RESULTS

We found that participants reported accessing diverse food environment types. They also reported experiencing recent and rapid changes in the types of foods they could grow, collect, or fish from those environments which they attributed to increased floods, drought, higher temperatures, and stronger storms. Moreover, seasonal changes in their ability to grow, rear, collect, and fish food led to an increased reliance on purchasing food from the built food environment, including fish, vegetables, and meat that participants described as being lower in quality than foods acquired in the natural food environment due to the production practices used. Some interviewees noted a trade-off between the need to rely on food acquired from the natural food environment to meet their immediate needs versus conservation efforts and resource management to protect future food sources.

CONCLUSIONS

Understanding the ways in which climate variability is influencing food environments and riverine livelihoods can help to identify ways to support climate change adaptation strategies, including regulations, that protect communities' access to nutrient-rich food sources. Future work should focus on identifying levers for strategies that increase food environment resilience within the context of increased climate variability.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP14_06

BRIDGING KNOWLEDGE SYSTEMS: A COMMUNITY-BASED PARTICIPATORY FOOD SYSTEMS APPROACH TO INDIGENOUS FOOD SECURITY AND FOOD SOVEREIGNTY

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BACKGROUND AND OBJECTIVES

This study aimed to co-design a participatory process to create a shared vision and understanding of a community food system to promote Indigenous food security, nutrition, and well-being. This study arose to support community-driven efforts for food security and food sovereignty in one Indigenous community in Canada. The innovation of this research lies in its bridging of Indigenous and Western research approaches, ensuring that Indigenous knowledge systems and practices are central to food security planning.

METHODS

The research proposes a Community-Based Participatory Food Systems Approach that aligns Indigenous and Western research methodologies, including community-based participatory research and system dynamics. This approach fosters collaborative engagement through participatory visioning and group model building workshops. Community members work together to explore their hoped future for their food system, develop a causal loop diagram centred on a priority food system issue, and identify strategies for food system change. Workshop data are analyzed qualitatively to develop themes characterizing participants' shared vision and understanding of their food system.

RESULTS

The participatory process resulted in a community food system vision emphasizing local values and priorities such as food production and access to land. The food system model developed highlighted the interconnectedness of food security, land management, social and cultural dimensions, and community participation, illustrating the many factors and dynamics shaping food security and food sovereignty at the community level. This shared, systemic perspective provided a framework for participants to identify impactful actions for the future. The findings and the dedicated engagement of community members demonstrate the value of aligning Indigenous and Western research approaches to address complex food system challenges.

CONCLUSIONS

This study contributes a new approach to Indigenous food security and food sovereignty research and planning by bringing together distinct knowledge systems in a way that prioritizes Indigenous values and cultural practices. It fosters self-determination by providing a framework for developing actionable strategies to promote food security and systemic change. The research offers a model for future community-based research and practice that honours and respects Indigenous knowledge while advancing community-driven food sovereignty initiatives.

CONFLICTS OF INTERESTS

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OAP14_07

GREENING SCHOOL LUNCH: A PATH TO SUSTAINABLE NUTRITION IN EDUCATION

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BACKGROUND AND OBJECTIVES

The intersection of climate change and sustainability with school nutrition programs is a critical, yet underexplored area of research. This study investigates the challenges and opportunities within school meal systems in Thailand, with particular emphases on the fostering of sustainable practices and climate resilience. Schools in both urban and rural settings share the responsibility of providing nutritious meals, but schools individually face different challenges of small budgets, unpredictable food sources, and reliance on conventional modes of agriculture production that hasten environmental degradation.

METHODS

The methodology included qualitative interviews with educators, school directors, and stakeholders combined with an analysis of food procurement practices, menu planning processes, and the integration of sustainability into meal programs.

RESULTS

The findings reveal that while many schools try to include local ingredients, logistical and financial barriers often limit their efforts. Hydroponic gardening and partnerships with local farmers have been at the pilot stage but remain fragmented. A key gap identified is the underutilization of local, organic, and sustainably sourced produce in school meals despite growing awareness of the health and environmental benefits. While urban schools have limited space and personnel to engage in agricultural activities, rural schools have a lack of infrastructure and difficulty accessing sustainable suppliers. This disparity in conditions between urban and rural areas highlights the need for systemic approaches that align local agricultural production with school nutrition needs.The findings also point out the potential of school meal programs to serve as platforms for the promotion of sustainability. Sourcing local and seasonal produce will reduce the carbon footprint of schools, adding value to regional economies. Educating students through meal programs can further instill lifelong habits of environmental stewardship and food security.

CONCLUSIONS

To achieve these goals, the study recommends policy interventions to provide incentives for local farmers to supply schools and invest in training and infrastructure that enables the implementation of sustainable food. Successful models can be taken to scale through effective collaboration of schools, local governments, and agricultural cooperatives. This research underlines the potential that school meal programs play in transforming the dual challenges of climate change and nutrition. As schools adapt to climate-related challenges, integrating sustainability into food systems is not just an opportunity but an imperative.

CONFLICTS OF INTERESTS

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LINKING CLIMATE CHANGE AND MALNUTRITION INDICATORS IN CHILDREN UNDER FIVE

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BACKGROUND AND OBJECTIVES

Climate change, driven by natural or human-induced factors, involves long-term shifts in climate, including rising temperatures and extreme events such as droughts. These changes disproportionately affect vulnerable populations, particularly children under five years of age, due to their rapid growth, heightened nutritional needs and dependence on caregivers for adequate food. Additionally, food security, and consequently malnutrition, is likely to be impacted by climate change, as extreme weather events disrupt food production, access and affordability, particularly in low-and middle-income countries. Thus, the objective is to investigate the relationship between climate change and malnutrition in children under five in Brazil.

METHODS

Data were collected from SISVAN, WorldClim and DATASUS to create a database linking malnutrition and climate change across all Brazilian municipalities from 2008 to 2019. Children's nutritional status was assessed using height-for-age, weight-for-height, and BMI-for-age indices. Mean climate anomalies were calculated from WorldClim precipitation and temperature data, measuring how much annual observations for each municipality deviate from the 1970-2000 historical average. We included the Standardized Precipitation-Evapotranspiration Index (SPEI), a measure combining precipitation and potential evapotranspiration to assess drought severity. We used generalized additive models to test the non-linear relationship between climate change (temperature, precipitation, and SPEI anomalies) and malnutrition in children. Linear regression analyses were conducted using the ‘mgcv’ package from R software.

RESULTS

Our study revealed significant associations between the SPEI and critical markers of undernutrition in children under five years of age. Thinness was associated with a Mean Coefficient of -0.41 (adjusted $R^2 = 10\%$), low weight-for-height, reflecting acute weight deficit, with a Mean Coefficient of -0.43 (adjusted $R^2 = 8\%$) and very low height-for-age, a marker of chronic undernutrition, with a Mean Coefficient of -0.23 (adjusted $R^2 = 6\%$). These findings highlight an impact of drought conditions on child nutritional outcomes, demonstrating that municipalities experiencing intensified and prolonged droughts, likely driven by climate change, face a heightened risk of undernutrition among children.

CONCLUSIONS

The study links climate change, particularly drought intensity, to a significant, though subtle, increases in malnutrition among Brazilian children.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP14_09

ASSESSING THE ACCEPTABILITY AND HEALTH IMPACTS OF A HEALTHY AND SUSTAINABLE DIETARY PATTERN (MED_EAT-IT): FINDINGS FROM THE INSTEAD STUDY

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BACKGROUND AND OBJECTIVES

The transition to sustainable diets that are healthy, culturally acceptable, affordable, and environmentally friendly is crucial to tackling the pressing challenges of global food and nutrition security. However, defining dietary patterns that meet these criteria remains complex and validation data from interventional studies are still scarce [1]. The INSTEAD study, part of the OnFoods project [2], aims at exploring the feasibility, acceptability, and health impacts of the MED_EAT-IT dietary pattern, an adaptation of the Planetary Health Diet tailored to the Italian context and optimized based on several initial assessments [3-6].

METHODS

A crossover, single-blind, randomized controlled trial has been implemented to assess the effect of this dietary pattern in a group of apparently healthy adults, and the intervention was recently concluded. Participants followed either the MED_EAT-IT diet or a Control diet based on the Italian food-based dietary guidelines for 8 weeks, separated by a washout period. Study outcomes include compliance, perceived acceptability (through a validated questionnaire [7]), dietary intake, nutritional status, body composition, physiological and metabolic function, including proteomic and metabolomic analyses.

RESULTS

Of the 121 screened individuals, 72 were randomized, and 53 completed the study (39 females, 14 males; mean age 44 ± 14 years). Acceptability of the MED_EAT-IT dietary pattern was rated as 6 (median, Q1-Q3 = 5-6) on a score ranging from 1 (completely unacceptable) to 7 (extremely acceptable). Also, no significant differences in terms of effort or feasibility were observed between the MED_EAT-IT and Control diets. Currently available health markers indicates that the MED_EAT-IT intervention led to a significant reduction in LDL cholesterol (between-group difference: -7.7 mg/dL; 95% CI: -13.9, -1.4; $p < 0.05$). Significant within-group modifications ($p < 0.05$) included improvements in fasting glucose (Δ = -2.9 mg/dL; 95% CI: -5.0, -0.9), triglycerides (Δ = -10.8 mg/dL; 95% CI: -17.1, -4.5), total cholesterol (Δ = -14.7 mg/dL; 95% CI: -20.4, -9.0), but also a reduction of ferritin (Δ = -4.4 µg/L; 95% CI: -8.3, -0.5), and hemoglobin (Δ = -0.2 g/dL; 95% CI: -0.4, -0.1).

CONCLUSIONS

Currently available findings suggest that the sustainable MED_EAT-IT dietary pattern can be considered feasible and well-accepted and with potential health benefits. However, observed reductions in iron status markers highlight the need for additional investigation. Further analysis and particularly, metabolomic and proteomic data will help elucidate individual responses and support personalized dietary strategies for specific target populations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 07 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

OAP7_01

SPECIES RICHNESS OF FRUIT AND VEGETABLES AND DIET QUALITY OF ITALIAN ADULTS

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BACKGROUND AND OBJECTIVES

Dietary species richness (DSR) is key to food security and nutrient adequacy. Fruit and vegetable consumption could contribute significantly to the food biodiversity of diets, however, studies about their DSR in comparison to diet quality are mostly not available. This is the first analysis evaluating the DSR of fruit and vegetables in comparison to the diet quality of Italian adults using nationally representative data.

METHODS

Data from the Italian dietary survey (IV SCAI study 2018-2020) was used, including 726 adults (346 male, 380 female), aged from 18 to 64 years old. Dietary assessment was conducted based on the EU Menu methodology of EFSA with the use of two 24-hour recalls. DSR of fruit and vegetable was calculated for both days per individual by counting and summing the total number of unique species consumed. Diet quality was assessed using the global diet quality score (GDQS). Total GDQS was calculated based on 25 food groups (score 0-49), and sub-indices GDQS+ (16 food groups; score 0-32) and GDQS- (7 food groups; score 0-17) were calculated according to the consumption of healthy and unhealthy foods, respectively. Total GDQS cut-off is defined as high risk for poor diet quality as of <15, while for low risk ≥23. A mean score for both days was calculated per individual. After testing for the normal distribution of the variables, Spearman's rho test for non-normally distributed variables was used to evaluate potential correlations between the DSR of fruit and vegetables and the diet quality indices for the total population and per gender.

RESULTS

The mean of total fruit and vegetable DSR summed for two days was 9 per individual. The mean of total GDQS was 18.95, which RESULTS in a moderate diet quality, but not a low risk of poor diet quality, while the mean GDQS+ and GDQS- were 7.77 and 11.18, respectively. Higher DSR of fruit and vegetable in total was positively correlated with higher total GDQS (better total diet quality) [rs=0.20; p= <0.001], GDQS+ (higher consumption healthy foods) [rs=0.20; p= <0.001] and GDQS- (lower consumption of unhealthy foods) [rs=0.07; p= 0.046]. When the correlations were tested per gender, positive correlations were found for total GDQS and GDQS+ both in males and females.

CONCLUSIONS

Based on this analysis, higher DSR of fruit and vegetables could result in higher diet quality in Italian adults, however further research in Europe regarding DSR and food biodiversity indexes is required. Varieties of fruit and vegetable species may have different nutrient profiles, but the use of 24-hour recalls cannot provide this information in most cases.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP7_03

LINKING DIETARY PATTERNS TO FOOD WASTE MANAGEMENT: INSIGHTS FROM MALAYSIAN ONLINE SURVEY

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BACKGROUND AND OBJECTIVES

Dietary preferences are hypothesized to influence what and how much of food is discarded, suggesting a relationship between food choices and waste generation. By focusing on how dietary patterns shape waste behaviors, we can identify strategies to promote more sustainable consumption practices and food waste prevention. This study aimed to identify food consumption patterns that explain their role in food waste management behaviour among Malaysian adults.

METHODS

An online survey was conducted among 1,061 Malaysian adults aged 18 years and above between December 2020 and January 2021. Data were collected through a self-administrative online questionnaire covering sociodemographic characteristics, dietary choices, and food waste management practices. Factor analysis using principal component analysis (PCA) with equamax rotation was used to identify different dietary patterns based on similar characteristics of dietary choices. Generalized Estimating Equation (GEE) analysis was used to associate emerging dietary patterns with food waste management behaviours. The analysis controlled for potential confounders such as age, sex, ethnicity, household size, and combined household income.

RESULTS

Factor analysis identified three dietary patterns accounting for 55.2% of variance in food choices: animal-based diet, health-food/sustainable-driven diet, and convenient food. Poorer food waste management was reported out-of-home (mean score: 69.9%) compared to inside-of-home (mean score: 74.4%). Individuals with health-food/sustainable-driven diets (aOR [95%CI] = 2.04 [1.78, 2.34]; $p<0.001$) and convenient food patterns (aOR [95%CI] = 1.29 [1.16, 1.44]; $p<0.001$) were more likely to manage food waste well, whereas those with animal-based diets (aOR [95%CI] = 0.83 [0.73, 0.94]; $p<0.001$) were more likely to exhibit poor food waste management.

CONCLUSIONS

These findings suggest that dietary patterns may influence food waste practices. Notably, health-food/sustainable-driven dietary patterns, which emphasize the consumption of edible portions, could potentially contribute to lesser food waste as compared to animal-based diet. Future research is warranted to further explore the components and edible portions of Malaysian dietary preferences in relation to their food waste habits.

CONFLICTS OF INTERESTS

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OAP7_04

EFFECTS OF WILDFIRES BURNED AREA ON CONSUMER FOOD PRICE WORLDWIDE: A CONSEQUENCE OF CLIMATE CHANGE

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BACKGROUND AND OBJECTIVES

The past two decades have seen unprecedented wildfires worldwide, which has caused large areas of damage to agricultural land. This damage can be highly disruptive to different sectors of the economy. While most studies report negative economic effects with increasing wildfires, the literature does not offer conclusive evidence regarding its risk on consumer food price index (the cost of a fixed basket of goods and services purchased by consumers). Preliminary analyses pertaining to the effects of wildfires on nutrition and economic indicators have focused solely on a single country, yet there is a need to understand the effects of wildfire damage on consumer food prices worldwide.

METHODS

A cross-sectional global analysis from 2002-2022 incorporating 160 countries [North America (16 regions), South America (12 regions), Europe (37 regions), Asia (45 regions), Africa (44 regions), Oceania (6 regions)] assessed the annual associations between burned forest area, burned crop land, and consumer food price index using Poisson regression. Forest and crop burned area data was obtained from the Global Wildfire Information System, whereas consumer food price index (measured with 2015 base prices) data obtained from Food and Agriculture Organization of the United Nations. Models controlled for crude oil prices, GDP, unemployment, gold prices, region, and trend. All models were interpreted as a rate ratio (RR).

RESULTS

From 2002-2022, consumer food prices experienced a significant ($P<0.001$) rise in each of the six continents, where Africa experienced the greatest increase (8.2% per year, $P<0.001$) and Oceania experienced the slowest rise (2.7% per year, $P<0.001$). Overall, adjusted models showed that for every 100,000 hectares of forest area burned, regions in South America, Europe, Asia, and Africa experienced a decrease in consumer food prices (RR 0.99, $P<0.001$). In contrast, for every 100,000 hectares of crop area burned, regions in North America, South America, and Africa experienced an increase in consumer price index (RR 1.001, $P=0.01$). Gold prices were the most significant predictor of consumer food prices.

CONCLUSIONS

These findings of this research suggest that the type of burned land can have different consequences on consumer food prices, including variations between regions in each continent. Future climate change may exacerbate such relationships and increase wildfires, possibly having important consequences for food costs.

CONFLICTS OF INTERESTS

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OAP7_06

TRANSITION TOWARDS HEALTHIER AND MORE SUSTAINABLE FOOD HABITS: WHAT IS THE ACTUAL COST FOR PARENTS FACING FINANCIAL HARDSHIP?

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BACKGROUND AND OBJECTIVES

Transitioning towards more plant-based diets is needed to protect the environment and improve public health. However, little is known about the determinants of this transition for low-income consumers, who already tend to have diets of poorer nutritional quality. Although sustainable diets would be less expensive than current diets, the acceptability of such changes still may be challenging. The aim of this study is to understand how financial scarcity could act as a barrier to the adoption of more sustainable diets, focusing on parents of children aged 3 to 11 as parenthood implies additional constraints on food choices.

METHODS

A mixed-method approach was used. First, fourteen semi-structured interviews were conducted with parents living in a deprived neighbourhood in France and reporting financial hardship. Sorting tasks were performed with 17 cards representing different food groups to explore perception of prices, food frequency consumption and willingness to adopt plant-based habits. A thematic analysis was carried out based on the transcribed interviews. Second, a representative sample of 500 parents in France completed an online questionnaire. The questionnaire was designed according to the scarcity theory and explored sustainable choice intentions, choice motives, perceived cost of a dietary change, feeling of powerlessness and perceived prices. Regression analyses will be conducted to identify the link between financial hardship and psychological constructs.

RESULTS

Qualitative analysis: Most parents reported a daily consumption of meat and/or fish and a low consumption of fruits, vegetables, pulses, nuts and whole grains. A healthy diet was automatically associated with higher costs, but the perception of price appeared to imply multiple rationales. Different costs were identified beyond the financial cost: the transition towards sustainable diets represented a cognitive, cultural, social and hedonic cost. Food choices were based on monthly routines, in which meat played a central role, favoured by trade-offs that limit its cost to the detriment of healthy foods.

Quantitative analysis: The RESULTS of the survey will be available by May 2025.

CONCLUSIONS

Food choices made by parents in financial hardship are rooted in stable habits which hinder the possibility of considering a change towards a more sustainable diet. Promoting sustainable food habits in this population should encourage the exposure to healthy plant-based foods at no additional financial cost, but also at no additional cognitive cost.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP7_07

WHAT ALTERNATIVE PROTEINS ARE EXPECTED BY CONSUMERS IN 7 NORTHERN EUROPEAN MEMBER STATES? A BRADLEY-TERRY MODEL

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BACKGROUND AND OBJECTIVES

Given the current climate emergency, shifting diets to more sustainable sources has been advocated for environmental and health perspectives [1, 2]. Such societal shift requires active involvement by citizens and their adoption of proposed alternatives[3]. In Northern Europe, meat and dairy consumption remains far above recommendations[4–6]. Therefore, the objective of this communication is to identify what kind of alternative proteins were preferred and expected by consumers by the end of 2024.

METHODS

Data Collection: A cross-sectional survey was conducted online by *Enkätfabriken* AB between November and December, 2024 in DE, EE, FI, LT, NO, PL and SE (n=5250, 50% women). The questionnaire included sociodemographic characteristics and ranking of consumer expectations toward alternative protein sources.

Data analysis: A Bradley-Terry model was fitted to evaluate consumer preferences for following alternative protein sources: fermented plant-based foods, cultivated proteins, fungi, algae, extruded plant-based proteins, and insects. Fermented plant-based products were used as the reference category. Analyses were perfomed with R version 4.4.2 (2024-10-31), using package BradleyTerry 2. A p-value <0.05 was considered significant.

RESULTS

All alternative protein categories were significantly less preferred compared to fermented plant-based products ($p<0.001$). Cultivated proteins were 32% less likely to be ranked as first, followed by extruded plant-based foods (47% less likely). Algae- and fungi-based products also showed lower preference, being 78% and 59% less likely to be ranked first, respectively. The least preferred protein source was insects with a log-odds estimate of -2.44 ($p < 0.001$). The model exhibited strong fit, with a residual deviance of 4.54e-13 and an AIC of 122.33.

CONCLUSIONS

Fermented plant-based foods are significantly preferred over other alternative proteins, with insect-based foods being the least favored option.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP7_09

ADVANCING COURAGEOUS LEADERSHIP PRACTICES TO TACKLE POWER IMBALANCES AND ACCELERATE CHANGE IN NUTRITION AND FOOD SYSTEMS: THE CASE OF THE NEXT GEN(D)ERATION LEADERSHIP COLLECTIVE

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BACKGROUND AND OBJECTIVES

The current food system fails to provide equitable access to nutritious food, exacerbating inequalities, environmental degradation and climate change. Addressing power imbalances in leadership can increase the effectiveness, equity, and resilience of food systems. This requires the unique perspectives and innovative practices of marginalized people, particularly women, who play a vital role in food systems but face substantial inequalities exacerbated by intersectionality. The Next Gen(D)eration Leadership Collective (NGLC) is a global innovative initiative that addresses these issues through interventions, like Forums and Pods which have engaged nearly 700 women since 2021. These online activities are based on the NGCL's 8 leadership practices (Manifesto) and Theory of Change (ToC) (Collective support- collective efficacy- collective agency- mobilizing coalition- collective action- redressing power imbalances). This study evaluates NGLC's activities (2021-2024) to identify strengths and weaknesses, informing its contribution to accelerating food system transformation.

METHODS

We conducted a process and impact evaluation of the NGLC's activities using a mixed-METHODS approach based on quantitative data on activities and participants and 27 semi-structured interviews with activities´ participants. We ran descriptive statistical RESULTS for quantitative data and deductive content analyses (based on the ToC) using the interviews.

RESULTS

The NGLC Forums engaged 473 participants and Pods, 123. Participants viewed the Forums as reflective spaces for discussing challenges and barriers to teamwork in food systems, addressing the two first steps (collective support and collective efficacy) of the NGLC ToC, recognizing the experiences of others and reinforcing supportive leadership. This raised awareness of structural barriers (gender and intersectionality), aiming to redress power imbalances in leadership. However, challenges arose in maintaining relevance post-pandemic. Participants noted the Forums' multiplier effect relied on individual capacities to implement discussed leadership values. The global character of the initiative was valued, but power inequalities were seen as territory specific. Participants valued the Pods but reported that they required significant commitment. They focused on collective support and, along with the Forums, addressed the 8 leadership practices outlined in the NGLC's Manifesto.

CONCLUSIONS

While challenges persist, the NGLC's approach has shown promise in accelerating food system transformation: it has contributed to raising awareness of structural barriers (gender and intersectionality), promoting collective work, and providing soft skills to exercise power.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 25 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

OAP25_01

Co-benefits and trade-offs between environmental impact and diet quality: RESULTS from a population-based cohort

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BACKGROUND AND OBJECTIVES

Dietary changes can reduce environmental impact and improve health outcomes, but trade-offs between these aspects may occur. In particular, concern has been raised for an increased risk of inadequate nutrient intake in environmentally adapted diets with lower amounts of animal-based foods. This study aims to identify potential co-benefits and trade-offs between environmental and nutritional perspectives by assessing the nutritional adequacy of self-reported diets varying in environmental impact.

METHODS

Dietary intake was based on data of 30 000 individuals (aged 56-70) within two population-based Swedish cohorts, who completed a food questionnaire in 2009 (1). Environmental impact was assessed based on life cycle assessment data using an aggregated score based on six environmental indicators (greenhouse gas emissions, cropland use, nitrogen application, phosphorus application, consumptive water use, extinction rate) (2). Linear regression analyses examined associations between dietary environmental impact and energy standardized nutrient intake across quintiles of aggregated environmental impact. Nutritional adequacy was assessed by comparing the mean nutrient intake in men and women to gender and age specific reference values (average requirements and recommended intake) of the Nordic Nutrition Recommendations 2023.

RESULTS

Diets with lower environmental impact were associated with *higher* intake of total carbohydrates, fibre, whole grains, sucrose (women), polyunsaturated fatty acids, linoleic acid and α-linolenic acid, but *lower* intake of protein, total fat, saturated fatty acids, monosaturated fatty acids, EPA, DPA, DHA, total n-3 fatty acids and alcohol. Diets with lower environmental impact were moreover associated to *lower* intake of most vitamins and minerals, except for potassium, and magnesium. Diets with lowest compared to highest environmental impact had higher adherence to some recommendations for macronutrients and met reference intake levels of all micronutrients except for selenium and vitamin D (women).

CONCLUSIONS

Self-reported diets with a lower impact on multiple environmental indicators had both positive and negative effects on diet quality. While low-impact diets had a lower intake of most vitamins and minerals, adherence to macronutrient recommendations was generally higher, and micronutrient intake was adequate, except for selenium and vitamin D.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP25_02

DETERMINANTS AND COMPARISON OF WILLINGNESS TO TRY PLANT-BASED FERMENTED FOODS FROM DIFFERENT TECHNOLOGIES IN 9 EU COUNTRIES

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BACKGROUND AND OBJECTIVES

Traditional fermentation techniques are valued for improving shelf-life, digestibility, flavour and texture of food (1). New technologies like biomass and precision fermentation offer solutions to efficiently manufacture value-added protein-rich products (2) and to produce specific bioactive ingredients (3). Fermentation technologies provide solutions to the nutritional and sensory challenges of the PBF category (4). Willingness to try (WTT) shows the consumer's level of acceptance of these technologies by providing strategic information on how to promote, market and make PB alternatives the new default. The objective of this study is to identify and compare the determinants of willingness to try for different fermentation technologies in 9 EU countries.

METHODS

A cross-sectional survey (December 2023/February 2024 in BE, CH, DE, DK, FI, FR, IT, RO, SE) to investigate consumer perceptions towards PB fermented foods (5). The questionnaire included sociodemographic characteristics, dietary lifestyle and WTT. Linear regression was performed with the 3 statements "I would be willing to try a product that is prepared through Precision/Traditional/Biomass Fermentation" as dependents and sociodemographic characteristics as explanatory variables. A p-value below 0.05 was considered significant.

RESULTS

In total, 7812 responses were collected; 50% females equally divided in five age groups. About 60% of the respondents are willing to try traditionally fermented foods compared to 50% willing to try foods made from biomass and precision fermentation. Across technologies, negative associations were found between WTT and being a female, and with age. Positive associations were found for WTT and education, financial situation and locality of residence. The coefficients associating WTT with diet show that moving towards a more plant-based dietary lifestyle increases the WTT by around 25-30%. The country of residence was not influencing WTT.

CONCLUSIONS

The more educated, well-off and PB-eating people are, the more willing they are to try a product made from Precision/Traditional/Biomass Fermentation in 9 EU countries. Older people, men and those living in rural areas are more reluctant to try such products. These aspects should be considered for promoting and supporting a sustainable, healthy and tasty dietary transition.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP25_03

SOUTH AUSTRALIAN GOVERNMENT FOOD, AGRICULTURE AND ENVIRONMENTAL POLICIES AND THE EXTENT TO WHICH THEY HELP OR HINDER THE DEVELOPMENT OF A HEALTHY, SUSTAINABLE AND EQUITABLE FOOD SYSTEM

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BACKGROUND AND OBJECTIVES

Food systems are made up of a complex web of interconnected and intersecting policies and activities from production to consumption. In high-income countries, like Australia, food systems are much less healthy for humans than they might be and contribute to degradation of the environment. This paper reports on the first stages of a study examining South Australian government food-related strategic policies and analyses the extent to which they help or hinder the development of a healthy, sustainable and equitable food system.

METHODS

South Australian government websites were searched to identify food-related strategic policies in the agriculture, environment, food processing, manufacturing, and marketing sectors. Agreed inclusion and exclusion criteria were followed resulting in a data set of 15 policy documents. We analysed these documents using NVivo 13 Software employing a detailed pre-defined qualitative coding framework to determine the types of policy actions engaged in (e.g. educational intervention), and the outcomes (e.g. health, sustainability, economic) these policy actions purported to achieve. The extent to which the policies recognised evidence and proposed action on social and commercial determinants of health and health inequities was also identified.

RESULTS

Our preliminary findings indicate that food-related policy in South Australia does not prioritise health or environmental sustainability. Environmental and agricultural policies favour adaption and resilience over mitigation, and sustainability outcomes, when articulated, were predominantly non-specific. We also found a strong focus on economic outcomes, such as attracting investment into “climate smart” businesses. Several policies did mention equity, but strategies often employed feeble language (e.g. “giving weight to equity considerations”). Our analysis indicates that some cooperation between government departments exists in policy formulation but more opportunities to enhance intersectoral collaboration are evident. In addition, silences were noticeable in several policies integral to the food system such as landscape management strategies.

CONCLUSIONS

Our research highlights the need for robust food policies in South Australia that act on evidence concerning the contribution of the food system to population health, environmental degradation and health inequities. While economic considerations are important our study suggests they dominant over efforts to create a healthy, sustainable, and equitable food system that benefits all South Australians.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP25_04

DIETARY INTAKE OF PLANT-BASED MEAT CONSUMERS VERSUS NON-CONSUMERS IN UK NATIONAL DIET & NUTRITION SURVEY

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BACKGROUND AND OBJECTIVES

Current knowledge on the influence of plant-based meat (PBM) on dietary intakes is mainly based on theoretical modelling studies, while evidence from actual consumption data of PBM consumers is scarce, preventing health authorities from developing clear guidelines on PBM consumption. Therefore, this study aimed to investigated dietary intakes of PBM consumers and compare them to those of non-PBM consumers and to dietary reference values.

METHODS

Cross-sectional dietary intake data of 18–64-year-old PBM consumers (n=101) and non-PBM consumers (n=1845), based on 4-day food diaries, from the UK National Diet & Nutrition Survey Rolling Program (2014-19) were used for the analysis. Independent student t-tests were performed to test for significant differences in food and nutrient intakes between PBM consumers and non-PBM consumers. Average nutrient intakes were compared to the estimated average requirements (EAR), or in case no EAR is established to reference average population intakes (AI), reference nutrient intakes (RNI) or upper limits (UL).

RESULTS

Average intake of PBM among PBM consumers was 36.5 ± 30.3 g/d. PBM consumers had a higher intake of fruit (+54%, $p<0.001$), vegetables (+49%, $p<0.001$), pulses (+42%, $p=0.04$) and non-alcoholic drinks (+13%, $p=0.008$), and a lower animal meat intake (-62%, $p<0.001$) than non-consumers. Nutrient intakes of PBM consumers were more in line with dietary reference values, with higher intakes of fibre (83% vs 62% of AI, $p<0.001$), polyunsaturated fatty acids (105% vs 96% of AI, $p=0.005$) and most micronutrients than non-consumers, a lower but adequate intake of protein (180% vs 191% of EAR, $p=0.001$), and no differences in saturated fatty acid (SFA) (both 122% of UL, $p=0.82$) and sodium intakes (89% vs 86% of UL, $p=0.49$). In both groups inadequate intakes of fibre, vitamin D, vitamin E, selenium, and potassium and too high intakes of SFA were found.

CONCLUSIONS

PBM consumers had more favourable food and nutrient intakes than non-consumers, suggesting that PBM can support the transition to a heathier plant-based diet. However, more dietary changes are required to ensure adequate intakes of all nutrients.

CONFLICTS OF INTERESTS

NN and AW are employees of Unilever, a company that produces and markets foods and beverages including plant-based meat alternatives. The other authors report no conflict of interest.

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OAP25_05

THE TRUE PRICE OF FATTY FISH: ENVIRONMENTAL EXTERNALITIES AND HEALTH IMPACTS IN THE PRODUCTION AND CONSUMPTION OF WILD-CAUGHT AND FARMED FISH IN THE NETHERLANDS

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BACKGROUND AND OBJECTIVES
The true price of fish, which reflects both its health benefits and potential risks, alongside the environmental impact of its production, is still under-studied. While fish consumption, particularly fatty fish, is associated with health benefits (e.g. cardiovascular diseases), contaminants in fish can pose risks to human health. Additionally, the METHODS of fish production, whether through wild capture or aquaculture, significantly affect biodiversity and present environmental challenges. The objective of this study was to calculate the true price of fatty fish by internalising the environmental and health costs associated with its consumption in the Netherlands.
METHODS

Nationally representative fatty fish consumption data were retrieved from the Dutch National Food Consumption Survey 2019-2021. Fish products were classified by species and fishery type. The cost-of-illness (COI) method was applied to determine the direct and indirect health costs of ischemic stroke, ischemic heart disease and intracerebral haemorrhage, taking into account the Population Attributable Fraction (PAF) to assess the proportion of these diseases associated with insufficient fish consumption. Environmental impacts were assessed for global warming, terrestrial acidification, freshwater eutrophication, marine eutrophication, land use, and water consumption using the Dutch Life Cycle Assessment Food Database Environmental prices from CE Delft 2023 were applied to monetise these impacts. A premium or discount reflecting the combined environmental and health impacts was applied to baseline Dutch food retail prices.

RESULTS

Majority of the Dutch population consume less fish than recommended by the dietary guidelines for sufficient fish consumption, resulting in €12,16 per capita and €159 million total external healthcare costs from this deficiency. The health discount for fatty fishes is -€2.38. Environmental costs vary by fish species and fishery type, with the highest price being for cultivated salmon and lowest for wild-caught mackerel. The true price reflect a percentage change ranging from -31% to +6% compared to current market prices (prelimnary resuts).

CONCLUSIONS

This study suggests that current fatty fish market for some fish species are below their true societal costs. The true pricing method provides a valuable tool to support the transition to sustainable production and consumption in the food system by internalising positive and negative externalities.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP25_06

NUTRITIONAL-ECOLOGICAL FACTORS AND THEIR RELATIONSHIPS IN SUSTAINABLE FOOD SYSTEMS - QUALITIATIVE MODELLING

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BACKGROUND AND OBJECTIVES

Food systems are complex and include production, processing, packaging, storage, transport and distribution. With a growing global population and an increase in diet-related non-communicable diseases, it is essential to address food systems in the context of planetary health. This includes consideration of the impact of climate change on the environment, ecosystems and human well-being, making it essential to integrate multiple dimensions into research and decision-making.

METHODS

A qualitative model of sustainable food systems was developed using the Nutrition-Ecological Modelling (NutriMod) method. A two-round Delphi study was conducted with 54 experts from different disciplines and countries to reach consensus on the model. All factors and relationships were graphically represented in a hyperlinked model, defined and supported by scientific literature. A total of 389 scientific papers were analysed.

RESULTS

The model is highly aggregated to reflect the complex reality of sustainable food systems. The many determinants relevant to sustainable food systems have been summarised in 60 factors, grouped into 15 thematic clusters and defined using evidence-based criteria based on the scientific literature. Different forms of relationships between the factors were visualised. The relationships can be further differentiated according to their direction, type and the inclusion, number and thematic cluster of the factors involved. The following effects can be distinguished Effects between factors within a thematic cluster; Effects between factors of different thematic clusters; Retroactive effects; Effects involving several factors. In addition, individual effects merge into effect chains and feedback loops that illustrate complex interrelationships and dependencies and lead to the final complex model of a sustainable food system. For example, livestock production leads to the formation of greenhouse gases, which affect the climate and accelerate global warming. Global warming has a number of effects on crop farming, such as land degradation and lower crop yields, which reduces food security. The interactive hyperlink model ensures that all factors and relationships are explained and that the sources used can be verified.

CONCLUSIONS

The model depicts the complex and multidimensional interrelatedness, promotes a common understanding of the topic by actors from different disciplines and thereby contributes to a transformation towards sustainable food system by supporting integrative problem-solving.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP25_07

GRASSHOPPER-BASED DIM SUM: A SUSTAINABLE AMINO ACID-RICH FOOD SOLUTION FOR PRESCHOOLERS

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BACKGROUND AND OBJECTIVES

Preschoolers (60–72 months) require high-quality protein for growth and cognitive development. With increasing global demand for sustainable nutrition, grasshoppers (*Valanga nigricornis*) emerge as a promising protein alternative due to their rich nutritional profile and lower environmental impact than livestock. This study explores grasshopper-based dim sum's amino acid composition and nutritional potential as a sustainable solution for supporting preschoolers' dietary needs.

METHODS

A controlled experimental design was employed, utilizing a Completely Randomized Design (CRD) approach to analyze the amino acid profile, proximate composition, and mineral content of grasshopper-based dim sum (F1: 25% grasshopper, 75% mackerel) compared to a control (F0: 100% mackerel). Amino acid content was quantified using UPLC and HPLC, with RESULTS evaluated against FAO/WHO guidelines. Nutrient adequacy was assessed using the Nutrient Adequacy Levels (NAL) for preschoolers.

RESULTS

The F1 formulation exhibited an amino acid score of 122, reflecting superior protein quality. Essential amino acids such as lysine (10,400.20 mg/kg) and tryptophan (1,028.26 mg/kg) significantly exceeded FAO/WHO requirements. Glutamic acid, present at 20,176.64 mg/kg, enhanced the nutritional impact and sensory acceptance. Additionally, F1 contributed to 56.1% of the protein and notable amounts of essential minerals, such as calcium and zinc, needed for growth and cognitive development.

% Amino acid contribution in children aged 4-6 years based on ANU/WHO 2007		
Lisin	176.4	297.1
Sulfur amino acids (Methionine+cystine)	61.1	122 (100+)
Threonine	251.7	356
Tryptophan	133.8	214.2

CONCLUSIONS

Grasshopper-based dim sum represents an innovative, eco-friendly, and nutrient-dense alternative to conventional protein sources. Its exceptional amino acid profile and contribution to preschoolers' nutrient needs underscore its potential to address protein malnutrition sustainably. Future research should explore long-term health impacts and consumer acceptance.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP25_08

DEATHS ATTRIBUTABLE TO DIET- AND WEIGHT-RELATED RISK FACTORS IN CITIES: A GLOBAL MODELLING STUDY

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BACKGROUND AND OBJECTIVES

Diets are a leading cause of global mortality from non-communicable diseases. While existing studies have conducted health risk assessments for regions, there is potential for targeted polices aimed at addressing public health at the city level. Our objective was to estimate deaths attributable to diet- and weight-related risk factors in cities.

METHODS

We used a comparative risk assessment framework to estimate attributable deaths from diet- and weight-related risk factors for adults living in cities with agglomerations of 300,000 individuals or more. The underlying data for intake of diet-related risk factors (vegetables, fruits, legumes, nuts and seeds, red meat) were based on proxies generated by combining waste-adjusted food availability data with sociodemographic trends from dietary surveys and estimates of energy intake for weight-related risk factors (underweight, overweight, obesity) inferred from anthropometric measures. We then used the age and sex distribution within populations from city-level data from WorldPop and World Urbanisation Prospects 2018 to infer dietary intakes and energy intakes.

RESULTS

Nearly half of global attributable deaths occurred in cities (3.9 million v. 8.7 million for countries). Cities with the highest proportion of deaths attributable to diet- and weight-related were typically from Eastern Europe (Ukraine, Belarus, Uzbekistan) and Russia (35-40%). Deaths from diet-related risk factors were highest for Ulaanbaatar (Mongolia) (25%), which was largely attributable to their consumption of diets high in red meat and low in fruits (each contributing 8% to total deaths). The proportion of deaths from weight-related risk factors was greatest for cities of countries in the Middle East (Iraq, Syria, Egypt, Bahrain) and Port of Spain (Trinidad and Tobago) (25%). Obesity was responsible for the greatest proportion of deaths from coronary heart disease (CHD) and type 2 diabetes (T2D) for cities in the Middle East and the USA (CHD: each 30%; T2D: 60% for Egypt, 55% for USA), and alongside diets low in vegetables for cities in the Democratic Republic of the Congo, contributed most to cancer deaths for cities in Egypt (each 17%). Diets low in fruits contributed most to deaths from stroke in Banjul (Gambia) (35%) and underweight to deaths from respiratory disease for cities in Ethiopia (28%).

CONCLUSIONS

Given that only one-third of the global adult population reside in cities but account for half of diet- and weight-related attributable deaths, our findings highlight the need for policy action at the city level to facilitate the transition to healthy and sustainable diets.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP25_09

A VISUAL TOOL FOR ASSESSING THE HEALTH AND ENVIRONMENTAL IMPACTS OF FOOD CHOICES

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BACKGROUND AND OBJECTIVES

The environmental and health impacts of food production and consumption are receiving increasing attention, yet studies often address these impacts separately. Additionally, existing visualizations of this information are often complex, limiting their accessibility to non-experts. This study aims to create a simplified, two-dimensional visual tool that connects a broad range of food groups to both human health outcomes and environmental sustainability, making this information more accessible to a wider audience and promoting healthier, more sustainable food choices.

METHODS

We conducted a comprehensive analysis of recent meta-analyses and reviews to evaluate the health and environmental impacts of 30 different food groups. Foods were classified according to their effects on human health (favorable, neutral, or unfavorable) based on mortality and morbidity outcomes for chronic diseases. Environmental impacts were assessed by their carbon footprint and classified as low, medium, or high. The interrelationship between health effects and carbon footprint is represented in a color-coded 3x3 matrix, allowing for clear visual comparison.

RESULTS

Our analysis supports the well-established understanding that plant-based foods are beneficial for both human health and the environment, while meat and some processed foods tend to have negative effects. However, not all plant-based foods provide the same level of benefit, and the impacts of animal-based foods vary widely. The matrix visualization allows for an easy comparison of these tradeoffs, helping to highlight the complexity of food choices in a clear and digestible format.

CONCLUSIONS

The 3x3 matrix provides an effective, simplified means of presenting the health and environmental impacts of many food groups. By making this information accessible to a broader audience, including non-experts, we hope to encourage more informed decision-making that can improve both individual health outcomes and environmental sustainability.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 29 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

OAP29_01

LOW-CARBON DIETS IN PRACTICE: BALANCING HEALTH AND SUSTAINABILITY THROUGH MEAL SERVICE STRATEGIES

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BACKGROUND AND OBJECTIVES

As climate change accelerates, dietary carbon emissions have become a critical concern for environmental sustainability. Food production contributes approximately 26% of global greenhouse gas emissions, with animal-based foods, such as meat and dairy, being major contributors. This study examines the composition of VIP meals provided in hospitals, which are often associated with larger portions of animal protein. These meals present a valuable opportunity to integrate sustainable dietary concepts. By analyzing the carbon footprint of these meals and revising their composition, the goal is to align meal offerings with low-carbon dietary standards.

METHODS

The original meals consisted of 100 g of animal protein (chicken, pork, or fish), 200 g of vegetables, 50 g of tuber-based sides, 80 g of white rice, and 30 g of soybean oil. Based on data from *Our World in Data*, the carbon footprint per meal ranged from 1.03 to 1.13 kg CO_2e. A revised 28-cycle menu was implemented with the following adjustments: (1) altering protein sources to a 7:3 ratio of animal- to plant-based proteins; (2) reducing soybean oil usage from 30 g to 20 g per meal; and (3) increasing the proportion of whole grains in the starch component to achieve a refined carbohydrate-to-whole grain ratio of 1:1.

RESULTS

The carbon footprint of the original meals was 1.13 kg CO_2e (chicken), 1.23 kg CO_2e (pork), and 1.03 kg CO_2e (fish). After revisions, the footprints decreased to 0.66 kg CO_2e, 0.73 kg CO_2e, and 0.80 kg CO_2e, respectively, meeting the ≤1 kg CO_2e standard for low-carbon diets. Additionally, each revised meal included approximately 140 g of fruit and achieved a balanced macronutrient distribution, with carbohydrates accounting for 45–65%, protein for 15–25%, and fat approximately 30%. A post-meal satisfaction survey reported satisfaction rates of 93–95%, demonstrating the revised meal plans' success in achieving both sustainability and nutritional balance.

CONCLUSIONS

The carbon footprint of the original meals exceeded the low-carbon threshold. By incorporating plant-based proteins, increasing vegetable portions, and substituting refined grains with whole grains, carbon emissions were significantly reduced. The implementation of these revised menu guidelines provides a practical pathway for achieving sustainable dietary practices while maintaining high levels of consumer satisfaction.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP29_02

ENVIRONMENTAL IMPACT AND PRICE OF NUTRIENT ADEQUATE DIETS; INSIGHTS FROM OPTIMISATION MODELLING USING THE IOTA MODEL®

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BACKGROUND AND OBJECTIVES

Over the past decade, there has been an increasing interest in the environmental sustainability of diets, but little attention has been paid to the nutrient adequacy, consumer acceptability and cost of such diets. The iOTA Model® is designed to fill this gap by offering an accessible and customisable platform for optimising diets. This study showcases the capabilitues of this model in simulation of a diverse range of dietary scenarios to reach nutrient adequacy at a national level, using New Zealand as an example.

METHODS

The iOTA Model® was constructed using mixed integer linear programming by integrating country-specific dietary data to generate nutrient adequate diets for adult males and females. The data was obtained from various open-access sources including but not limited to food composition (adjusted for protein and amino acid digestibility for more accuracy), dietary greenhouse gas emissions (GHGE), national nutrition surveys and food prices. Optimisation was performed by minimising deviation from sex-specific baseline diets as an objective function and sex- and age-specific nutrient targets as constraints.

RESULTS

The RESULTS demonstrated that making minimal adjustments to the current diets of both male and female New Zealanders to achieve nutrient adequacy can reduce both dietary GHGE and price. For example, when optimising diets of the 19-30 year old males, weekly GHGE and price of the diet dropped by 30% and 26%, respectively. These optimised diets showed higher intake of nutrient-dense foods such as green leafy vegetables, legumes and pulses, and offal while reducing the intake of discretionary foods, root vegetables, ruminant meat, pork and seafood. The lowest dietary GHGE achieved was 6 kg CO2-eq per week, a 79.4% reduction for 19-30 year old females, with the diet showing greatest deviation from the baseline dietary pattern. Despite all nutrient targets being met, this low impact diet had very limited food variety and a heavy reliance on fortified foods.

CONCLUSIONS

This study shows that adhering to dietary guidelines alone may provide reductions in dietary GHGE without making drastic shifts in the current diets of New Zealanders. The iOTA Model® is a powerful tool for simulating nutrient adequate diets enabling users to customise simulations based on their own preferences and access in-depth knowledge about nutritional composition, environmental impact and price of optimised diets. The iOTA Model® is publicly accessible and expandable to other regions across the globe.

CONFLICTS OF INTERESTS

Development of the model was performed by researchers of the Sustainable Nutrition Initiative® at the Riddet Institute, Massey University, and supported by the Global Dairy Platform.

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OAP29_03

TRUE ILEAL AMINO ACID DIGESTIBILITY OF TENEBRIO MOLITOR LARVAE DETERMINED BY THE DUAL STABLE-ISOTOPE TRACER METHOD IN YOUNG WOMEN

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BACKGROUND AND OBJECTIVES

Meeting human protein requirements in sufficient quantity and quality, while keeping production within the planetary boundaries, demands a transition to more sustainable protein sources. Edible insects, such as *Tenebrio molitor* (TM) larvae are rich in protein and indispensable amino acids (IAAs) and can be produced with a lower environmental footprint compared to conventional animal source proteins, but no human studies have been conducted on protein digestibility till date.

METHODS

We reared TM on (2H)-labelled maize and yeast. TM were freeze dried and administered with vegetable soup to 5 healthy women (18-45y, normal BMI) using a plateau-feeding protocol The meal was divided into 10-mini meals and administered hourly, from 8:00 to 16:00 following a priming meal composed of 3 combined mini meals. We assessed true ileal digestibility of the IAAs; methionine, phenylalanine, threonine, lysine, leucine, iso-leucine, and valin by comparing the plasma appearance of individual IAA from intrinsically (2H)-labelled TM relative to a crystalline 13C-algal amino acid mixture as a reference.

RESULTS

All participants completed the feeding protocol. The mean (SD) protein digestibility (n=5) for the IAAs was 83.7 (0.5)%. For comparison, previously reported values for digestibility using the same methodology are 60.0 (8.0) % for chickpeas, 61.2 (9.1) % for mung beans, 89.4 (4.5)% for whole boiled eggs, and 92.0 (2.9)% for chicken meat. This suggests TM digestibility to be in a similar range than conventional animal protein.

CONCLUSIONS

The high protein digestibility of TM demonstrates its potential as an excellent protein source for human nutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP29_04

ADHERENCE OF THE SWISS DIET TO THE EAT-LANCET PLANETARY HEALTH DIET AND ITS RELATED SUSTAINABILITY IMPACTS

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BACKGROUND AND OBJECTIVES

Low quality diets are a key risk factor for global morbidity and mortality as well as for environmental deterioration. In 2019, the EAT-Lancet commission proposed the planetary health diet (PHD), a healthy and environmentally friendly reference diet encouraging the consumption of plant-based foods and limiting the intake of animal-source foods, refined grains, saturated fats, and sugars. We aimed to compare the average Swiss diet to the PHD and assess its sustainability impact. The Swiss diet was examined overall, and by sex, language region, and the four main Swiss dietary patterns.

METHODS

We used data of the cross-sectional population-based National Nutrition Survey menuCH (2014-2015, n=2057, 18-75 years). Food consumption was assessed with two 24-hours dietary recalls and food avoidance was collected with a self-administered questionnaire. Using the Multiple Source Method, the habitual food intake of the participants was calculated. The environmental and socio-economic impacts of the Swiss diet were examined by determining Greenhouse Gas (GHG) emissions, total land and grassland use, the Social Hotspots Index (SHI), and the diet's costs. Adherence to the PHD and sustainability impacts of the Swiss diet were analyzed descriptively.

RESULTS

Compared to the PHD, the menuCH study population, representative for Switzerland, consumed on average less legumes (2.1% of the recommended amount), whole grains (8.9%), nuts (11.7%), unsaturated fats (27.9%), and vegetables (68.1%) and more red meat (509.2%), dairy products (231.5%), and sugars (151.4%). Closer adherence to the PHD was observed for females and for the Prudent dietary pattern. None or few participants adhered to the recommendations on whole grains, legumes, and nuts, whereas nearly all adhered to the recommendations on tubers and starchy vegetables and saturated fats. The sustainability impacts were generally similar among subgroups, but relevant trade-offs were identified between social impacts, costs, GHG emissions, and healthy diets. Overall, diets low in animal-source foods tended to have reduced GHG emissions and land use, whereas diets high in fruits and vegetables tended to have higher costs and risks of adverse social impacts.

CONCLUSIONS

A dietary shift towards increased consumption of regionally produced plant-based foods and decreased consumption of animal-source foods would lead to higher diet quality and lower environmental footprint of the average Swiss diet and should be encouraged by future public health measures.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP29_05

A 10-MONTH CLUSTER-RANDOMIZED TRIAL TO SHIFT TOWARDS PLANT-FORWARD MEALS IN EARLY CHILDHOOD EDUCATION AND CARE CENTERS – EFFECTS ON BONE AND MINERAL METABOLISM IN FINNISH CHILDREN

Suvi Itkonen[1]; Jelena Meinilä[1]; Henna Vepsäläinen[1]; Liisa Korkalo[1]; Sari Niinistö[2]; Susanna Raulio[2]; Mari ÅKerlund[2]; Tuuli Korhonen[2]; Leena Forma[3]; Merja Saarinen[4]; Suvi Virtanen[2, 5, 6]; Maijaliisa Erkkola[1]
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BACKGROUND AND OBJECTIVES

A shift towards predominantly plant-based diets is emphasized for health and environmental sustainability. This transition may affect nutrient adequacy. We investigated how a change towards plant-forward meals in Finnish early childhood education and care (ECEC) centers affects bone and mineral metabolism and intakes of bone-related nutrients in 3-5-year-old children.

METHODS

ECEC centers were cluster-randomized into 11 intervention and 12 control ECEC centers. During the 10-month intervention, more plant-based products and less red meat was served at ECEC centers. A moderation in milk consumption was also encouraged. We also provided the intervention ECEC centers with food education materials tailored to support the menu change. The control ECEC centers maintained their regular meals. Blood samples (both before and after the intervention) were available from 18 children in the intervention arm and 28 children in the control arm. Differences in bone and mineral metabolism markers (serum tartrate-resistant acid phosphatase 5b [TRAP5b], total and bone-specific alkaline phosphatase (ALP; BAP), 25-hydroxyvitamin D, calcium, phosphate, and plasma parathyroid hormone) between the groups were analyzed using analysis of covariance (adjusted for baseline, sex, and height).

RESULTS

Preliminary analysis showed that bone resorption marker TRAP5b, bone formation marker BAP, and ALP concentrations were higher in the intervention arm compared to the control arm ($P<0.05$). No other differences were observed ($P>0.05$).

CONCLUSIONS

The RESULTS suggest increased bone turnover when transitioning to plant-forward meals, indicated by higher bone resorption and bone formation marker concentrations. This may raise concerns about long-term bone health since the shift of bone turnover during childhood should be towards bone formation. However, the small dataset limits the generalizability. Further analysis of nutrient intakes may reveal the underlying causes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP29_06

BIO-ORGANIC FERTILIZATION OF UPLAND RICE IN MADAGASCAR : EFFECT ON NUTRITIONAL COMPOSITION OF RICE GRAINS AND CHARACTERIZATION OF FARMER'S RICE-BASED DIETS

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BACKGROUND AND OBJECTIVES

In Madagascar, to meet the growing demand of rice, the staple food , its rain-fed cultivation on the hills has developed despite their poor soils. Innovative agroecological practices on upland rice cultivation, including earthworms and their capability in producing nutrient-rich fertilizers (vermicompost) were developed in a collaborative research project with local farmers. The aim of this study was to understand the nutritional repercussions of this innovative fertilization at several levels: the nutritional composition of rice, the nutritional quality of rainfed rice dishes and the overall diet quality.

METHODS

The Chhomrong Dhan rice (*Oryza sativa*) variety was cultivated with traditional and innovative practices by 11 farmers spread across 5 villages in the district of Imerintsiatosika. Nutritional components (proteins, minerals, B1 vitamin) were determined after decortication and polishing. Feeding practices involved the monitoring of 5 traditional rice recipes and 8 accompanying dishes (n=3 for each dish combination), with 24 families among the project farmers. 42 farmers responded to the Malagasy Diet Quality Questionnaire (DQQ).

RESULTS

Innovative fertilization had no significative impact on rainfed rice nutritional composition, compared to traditional practices, for both whole-grain and semi-husked rice as consumed locally. The nutritional quality of the 8 rice-based dishes showed low Individual Nutritional Recommendations Adequacy Score (SAIN) (4.2 ± 1,4 % for 100 kcal) and low Score of compounds to be nutritionally limited (2.6 ± 1,3 % for 100g), showing a global poor diet. Concomitantly, the energy contribution of 100g of rice dishes to nutritional requirements of proteins and lipids was only 12.2 and 12 % respectively as recommended, while that of carbohydrates was 76%, linked to a high mean rice consumption, 540 to 782 g per dish portion, instead of 45-50 %. According to the DQQ, the Food Group Diversity Score (FGDS) was shown to be adequate for 62% of farmers, and only 67 % of people have an adequate All-5 indicator, including the main five food groups of dietary guidelines (starchy food, vegetables, fruits, pulses and nut, animal-source foods).

CONCLUSIONS

Despite minor beneficial effects of agroecological practices on the nutritional quality of upland rice, the overall diet of rural inhabitant could be improved by increasing consumption of food groups other than starchy foods, locally available grown or raised.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP29_07

DAIRY TRENDS IN THE UNITED KINGDOM: A COMPREHENSIVE ANALYSIS OF DIET, NUTRIENT, AND ENVIRONMENTAL IMPACTS USING THE NATIONAL DIET AND NUTRITION SURVEY

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BACKGROUND AND OBJECTIVES

Dairy provides key nutrients but has mixed associations with chronic disease, depending on dairy type and fat content. The UK's Climate Change Committee recommends a 20% reduction in dairy consumption by 2030 to meet Net Zero greenhouse gas emissions. However, previous trend analyses have primarily focused on total dairy or certain categories like milk, without disaggregating dairy content within composite foods (e.g., lasagne). A recent Scottish analysis found that failing to disaggregate dairy from composite dishes underestimates dairy intake. Therefore, understanding trends in specific dairy types and fat content groups is critical to inform effective sustainable diet strategies. We aim to (1) disaggregate dairy from composite foods; (2) assess trends in dairy consumption and dairy's contribution to nutrient intake; and (3) estimate dairy's environmental impact.

METHODS

We analyse 11 rounds of the UK National Diet and Nutrition Survey (2008/09 to 2018/2019). Using the UK Nutrient Databank (NDB) and Food Standards Agency Recipes Database, we disaggregate dairy in composite dishes and classify by type (milk, yogurt, cheese, butter, cream) and fat content (skimmed, semi-skimmed, whole). We estimate mean daily intake (g/day) per 2-year cycle with generalized linear regression models. Environmental indicators are linked to the NDB via foodDB, a UK grocery database with life cycle assessment data.

RESULTS

Total dairy consumption remains stable over the 11-year period, at 256.0g/day in 2008/09 and 237.4g/day in 2018/19 (P=0.11). Milk intake decreases by 11.9% (-24.7g/day, from 207.0 to 182.3, P<0.05), with no change in fat content groups. Yogurt consumption increases by 23.8% (+4.5g/day, from 18.9 to 23.4, P<0.05), with a 34.6% increase in skimmed yogurt (+0.9g/day, from 2.6 to 3.5, P<0.05). Cheese intake overall remains unchanged (P=0.61); however, cheddar cheese decreases by 12.0% (-1.4g/day, from 11.7 to 10.3, P<0.05), offset by a 17.9% increase in "other" cheese (+1.4g/day, from 7.8 to 9.2, P<0.05). Cream consumption sees no change (P=0.23). Butter intake rises by 35.7% (+2.0g/day, from 5.6 to 7.6, P<0.05).

CONCLUSIONS

These findings reveal nuanced shifts in UK dairy consumption over the past decade. The slight rise in butter consumption will increase saturated fat intake, while the growth in yogurt consumption, particularly skimmed varieties, aligns with positive, health-oriented dietary shifts. Future analyses will integrate nutrient profiles and environmental indicators to provide a fuller picture of dairy's role in a sustainable and healthful diet.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP29_08

ASSESSING DIETARY GREENHOUSE GAS EMISSIONS IN KOREA IMPLICATIONS FOR SUSTAINABLE NUTRITION AND CLIMATE CHANGE MITIGATION

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BACKGROUND AND OBJECTIVES

The food industry is a major contributor to greenhouse gas (GHG) emissions, accounting for about half of human-generated emissions. These emissions stem from diverse sources, including agricultural practices, deforestation, transportation, food processing, and waste. With climate change causing significant environmental and societal impacts, it is crucial to assess and mitigate GHG emissions associated with dietary patterns and food systems. This study examines dietary GHG emissions among Koreans and evaluates the environmental impact of dietary recommendations.

METHODS

Data from the 7th Korea National Health and Nutrition Examination Survey (KNHANES, 2016–2018) was analyzed, including dietary recall data from 21,271 participants aged 1–80 years. GHG emissions were calculated using food systems-related greenhouse gas emission factor database. Demographic characteristics such as region, income, and education were analyzed for their impact on dietary emissions. Statistical analyses were conducted using SAS 9.4.

RESULTS

On average, Koreans emit 5.08 kgCO2eq/day from their diet. Emissions were highest for "Meats" and "Beverages," followed by "Alcoholic beverages" and "Fish and Shellfish." Men and individuals in their 20s to 40s emitted more GHGs than other groups. Urban residents, particularly in medium-sized cities, showed higher emissions than rural populations. Higher income and education levels were also associated with increased dietary emissions. Dietary recommendations advocating two daily servings of dairy were found to align with lower GHG emissions, averaging 5.04 kgCO2eq/day.

CONCLUSIONS

Dietary choices significantly impact GHG emissions, with meats and beverages being major contributors. Addressing these emissions through sustainable dietary practices and policies is vital for climate change mitigation. Aligning dietary guidelines with environmental goals can reduce emissions while supporting health and nutrition.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 56 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

OAP56_01

REPLACING MEAT AND DAIRY WITH PLANT-BASED OPTIONS IN SPAIN COULD REDUCE ENVIRONMENTAL HUMAN HEALTH DAMAGE BY A THIRD WHILE PROMOTING MORE NUTRITIONALLY ADEQUATE DIETS

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BACKGROUND AND OBJECTIVES

The shift from traditional plant-based Mediterranean diets to Western dietary patterns in Spain has exacerbated chronic diseases and increased environmental degradation. The human health damage derived from this environmental degradation has received less attention so far. This study quantifies the human health burden linked to the environmental impacts of Spain's food demand, assessing the potential benefits of reducing meat and dairy consumption and food waste.

METHODS

Using the IMPACT World+ v2.0.1 Life Cycle Impact Assessment method, the environmental health impacts of food consumption and waste in Spain during 2022 were evaluated. ReCiPe 2016 v1.1 was used as sensitivity analysis. Scenarios involving the reduction or replacement of meat and dairy with plant-based options and the mitigation of food waste were analyzed for environmental human health and nutritional outcomes.

RESULTS

Meat and fish were the food groups with higher environmental human health impact, both on a weigh and protein content basis. Meat, fish, and dairy contributed 56% of dietary environmental human health damage, with total food demand resulting in 228,156 DALYs. Replacing 100% of meat and dairy with plant-based alternatives could reduce this burden by 32.4%, while eliminating food waste could lower it by 4.6%. Combined interventions may prevent 37% of DALYs. Nutritional analyses demonstrated that these dietary changes would result in diets more closely aligned with WHO guidelines, promoting improved adherence to recommended nutrient intakes.

CONCLUSIONS

Transitioning towards plant-based diets and reducing food waste can significantly decrease environmental human health damages while fostering healthier, nutritious, and sustainable dietary practices in Spain. Policymakers should integrate these strategies into public health initiatives to mitigate planetary and health crises.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP56_02

DIET QUALITY PATTERNS AMONG SETTLED FULANI HOUSEHOLDS IN TCHAOUROU, NORTHERN BENIN: A SEASONAL ASSESSMENT

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BACKGROUND AND OBJECTIVES

In low- and middle-income countries, the livestock sector is crucial, contributing significantly to agricultural Gross Domestic Product [1,2] and supporting livelihoods, nutrition, especially among pastoralist groups like the Fulani in West Africa [3,4]. However, climate change, resource depletion, and land use changes threaten their nomadic way of life, prompting a transition to sedentary lifestyles [5-7]. This study aims to address gaps in knowledge by providing insights into dietary quality among Fulani communities, often excluded in nutrition surveys in Benin.

METHODS

The study, conducted in two settled Fulani villages in Tchaourou, northern Benin, monitored 79 households from October 2023 to September 2024. Diet quality patterns were evaluated using a longitudinal food survey with a pictogram-based questionnaire, recording seven days of monthly household food consumption [8]. Informed and clear consent was obtained from all relevant parties involved in the study. Statistical analyses included the Kruskal-Wallis test and Dwass-Steel-Critchlow-Fligner test for mean and seasonal comparisons.

RESULTS

The average household size was 8.6 members (SD = 4). Fulani households demonstrated stable dietary diversity scores (M = 7.9, SD = 4) over time, though diversity declined significantly in June and July 2024. Food consumption scores (FCS) also fell within the acceptable range (FCS > 35), with an average of 66.5 (SD = 18.2), but showed marked decreases during the dry season (January–March 2024). Diets were dominated by unprocessed cereals, consumed consistently throughout the year (M = 6.9 times per week), while processed cereals (1.7 times), roots, tubers, and pulses (3.7 times) varied seasonally ($p < .001$). Frequency of fruit consumption (2.2 times) was also seasonal, with vitamin A-rich fruits like mangoes and papayas peaking in April and May (4 times weekly). Dairy consumption (3.8 times) varied seasonally, decreasing during the dry season and peaking during the rainy season (May–August 2024), when milk production increases.

CONCLUSIONS

Fulani households in Tchaourou demonstrated good dietary diversity and acceptable food consumption scores. However, their diet is characterised by seasonal variations in staple foods, fruits, and animal-source foods, particularly dairy, which is heavily influenced by climatic cycles.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP56_03

THE INTEGRATION OF GENDER EQUALITY, DISABILITY AND SOCIAL INCLUSION (GEDSI) PRINCIPLES IN FOOD AND CLIMATE POLICY IN INDONESIA

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BACKGROUND AND OBJECTIVES

Little is known about how Indonesian policies target the most food-insecure and climate-vulnerable members of the community, particularly in terms of gendered and social inequities. This policy review aimed to examine the intersectionality and inclusion gaps in Indonesian food and climate policies.

METHODS

Active policy documents regulating food security and climate change were searched on national, provincial, and local government websites in November 2023. A gender equality, disability and social inclusion (GEDSI) analysis was conducted by assessing the inclusion of GEDSI considerations in existing policy directives and examining how evidence of gender, race, age, sex and sexuality, socio-economic background, geographical location, and disability status had been incorporated in policy design.

RESULTS

Following the screening process, 36 policy documents published from 2009 to 2023 were included in the review. Food-climate intersectionality was addressed in 16 (44%) documents, and GEDSI components were mentioned in 25 (69%) documents. The use of scientific evidence in food and climate policies was rare: some food policies referred to national food and nutrition surveys while climate policies were founded on government-led climate and environmental analyses. GEDSI was incorporated within policies in diverse ways, with women and children being commonly addressed considering their higher risks of undernutrition. People with disabilities were only mentioned in two documents. No policy discussed the inclusion of community voices in the policy development process.

CONCLUSIONS

The review highlighted variations in Indonesia's attempt to incorporate GEDSI in policy directives intended to address food and climate issues. Future policies need to better incorporate GEDSI principles by clearly defining the targeted social groups, planning sustainable support actions, accounting for relevant evidence, and engaging community and diverse perspectives in the policy development process to reduce inequalities.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP56_05

DIETS OPTIMIZED FOR ENVIRONMENTAL SUSTAINABILITY AND HEALTH: IMPLICATIONS FOR DIET COSTS ACROSS SOCIO-ECONOMIC POSITIONS FOR DUTCH ADULTS

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BACKGROUND AND OBJECTIVES

Universal access to healthy, safe, environmentally sustainable, and affordable diets is imperative for individuals across all socio-economic positions. The objective of this modelling study was to investigate how dietary patterns can be improved among Dutch adults with different socioeconomic backgrounds, and how these changes affect the costs of their diets.

METHODS

Food consumption data for 1747 adults were derived from the Dutch National Food Consumption Survey 2019–2021. Participants were categorized according to their highest attained educational level (low, intermediate, high) as proxy for socio-economic position. For each individual the diet was minimized for greenhouse gas (GHG) emissions and maximized for diet quality according to the Dutch Healthy Diet 2015 (DHD15) index. Optimized diets were made using a benchmark approach, involving linear combinations of current diets, either within or across the three educational subgroups (i.e. peer groups). Constraints limited individual dietary changes to within 33% of current consumption, except for less commonly consumed food groups. Diet costs were compared between current and optimized diets. Secondary outcomes included nutritional aspects and additional environmental impact indicators.

RESULTS

For all educational subgroups, the optimized diets had on average a 19-24% lower GHG emission and a 52-56% improvement in diet quality (DHD15 index) compared to current diets, and the median diet costs remained similar. Depending on the educational subgroup, selected optimal diets contained more vegetables (6%), fruits (8-16%), nuts (37-89%), legumes (100-133%), and fish (59-66%), and less grains (-8-5%), dairy (-17-12%), meat (-27-25%), cheese (-11-6%), soft drinks (-45-42%), and juices (-56%-18%). More pronounced improvements were found when the optimization was not stratified by educational level.

CONCLUSIONS

Across all socio-economic subgroups modest dietary changes can improve healthiness and environmental impacts of diets, without affecting diet costs. Furthermore, socio-economic disparities in diet quality can be reduced without additional diet costs, provided these educational subgroups are willing and facilitated to adopt diets divergent from their peer group.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP56_06

DIETARY ENVIRONMENTAL IMPACT AND ITS ASSOCIATION TO THE DEVELOPMENT OF OVERWEIGHT AND OBESITY IN YOUNG CHILDREN: THE GECKO DRENTHE COHORT

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BACKGROUND AND OBJECTIVES

The growing global population demands a shift towards sustainable diets that are healthy, environmentally friendly, acceptable, and affordable. Shifting towards more plant-based diets may have consequences for food and nutrient intake, but are generally considered more healthy. In this study, we explore the environmental sustainability of diets in young children and relate this to the development of overweight.

METHODS

In the GECKO Drenthe birth cohort, dietary intake was derived from a validated 71-item food frequency questionnaire designed for children aged 2-12 years, filled in by parents, when children were 3 years old. Diet-induced Greenhouse Gas Emissions (GHGE) and Blue Water Consumption (BWC) were calculated using Lifecycle Assessment data by the Dutch Institute for Public Health and the Environment and adjusted for the total amount of food consumed, for total, solid food consumption and liquid food consumption. BMI Z-score, the change in BMI Z-score between 3 and 10/11 years old, and weight status (overweight/obesity by IOTF criteria) were derived from height and weight measured by trained nurses.

RESULTS

The final analysis included 893 children (50.2% male). After excluding 73 children with overweight and obesity at 3 years, 820 children (50.6% male) were included for the analyses of overweight/obesity, of which 107 (13%) developed overweight/obesity at 10/11 (10.6±0.4) years old. The mean GHGE from solid foods and liquid foods were 1.88±0.58 (mean±SD) kg CO2eq./day and 0.57±0.29 kg CO2eq./day, respectively. The mean BWC from solid foods and liquid foods were 27±8 liter/day and 15±14 liter/day, respectively. GHGE and BWC from grains, fruits, meats, dairy products, sugary snacks, and sugar-sweetened beverages contributed most to total GHGE and total BWC. After adjusting for potential confounders, GHGE per kg of solid foods in the highest tertile was associated with a higher BMI Z-score (β=0.159 (95% CI 0.001, 0.318)) and a higher weight gain (delta BMI-Z, β=0.21 (0.06, 0.35)) at 10/11 years old, compared with the lowest tertile. Both GHGE per kg of solid foods in the highest tertile (OR=1.83 (1.06, 3.16)) and BWC per kg of solid foods in the highest tertile (OR=1.69 (1.01, 2.84)) were related to a higher risk of developing overweight/obesity at 10/11 years old, compared with the lowest tertile.

CONCLUSIONS

A less sustainable diet among young children was associated with a higher risk of developing overweight and obesity in later childhood. Promoting sustainable dietary habits may bring benefits to young children in preventing overweight and obesity.

CONFLICTS OF INTERESTS
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OAP56_07

ONE HEALTH CONCEPTUALISATION OF SUSTAINABLE DIETS IN LOW- AND MIDDLE-INCOME SETTINGS: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

Average diets fail to meet basic health and environmental needs. They are proven risk factors for non-communicable diseases and mortality, diminish natural resources, and contribute to climate change. This is particularly challenging in low- and middle-income countries (LMICs) with a fast-growing population concurrently compounded by multiple burdens of malnutrition and increasing climate change impacts exacerbating food/nutrition insecurity and livelihoods. Sustainable diets protective of One Health (human, animal, plant and environmental health) promises to address this challenge, yet LMICs are often underrepresented in global studies on sustainable diets. The objective of this review was to conceptualise dietary sustainability in LMICs integrating the One Health approach.

METHODS

Using the preferred reporting items of systematic reviews and meta-analyses (PRISMA) guidelines and the checklist for one health epidemiological reporting of evidence (COHERE) standards, four bibliographical databases were searched (Embase, Global Health, Web of Science, and Scopus) between 1947 and June 2023. Dietary sustainability was assessed in LMICs by evaluating coverage across the four One Health pillars (human, animal, plant and environmental health) and five dietary sustainability dimensions (diet/nutrition, health, environment, economic and social). Data were extracted and analysed qualitatively.

RESULTS

The database searches yielded 3122 studies. After removing duplicates and screening for eligibility, 35 studies were selected for inclusion. Most studies were from upper (77%) and lower (20%) middle-income countries. While 19 studies assessed human and environmental health, none assessed plant or animal health, nor all four One Health pillars combined. No study assessed all five dietary sustainability dimensions. Most studies assessed two (54%) or three (34%) dimensions, and the most frequently assessed dimension was the environment (71%). Overall, the assessment of the 35 studies found that LMICs' diets are unsustainable due to low quality, low diversity, and high environmental effects, with associated inequities.

CONCLUSIONS

The underrepresentation of LMICs, particularly, low-income countries, in this review is a wake-up call urging the generation of more country-specific data incorporating more dietary sustainability dimensions and One Health pillars (especially plant and animal health considerations) for progress and monitoring towards attaining global dietary sustainability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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ADHERENCE TO THE EAT-LANCET DIET AND THE INCIDENCE OF MAJOR DEPRESSIVE DISORDER: FINDINGS FROM THE SWISS COLAUS|PSYCOLAUS COHORT STUDY

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BACKGROUND AND OBJECTIVES

The EAT-Lancet diet, a flexitarian dietary pattern recommended to promote health and preserve environmental resources, has demonstrated benefits in preventing cardiometabolic diseases and cancers. Emerging evidence suggests that a healthy diet may also play a role in preventing Major Depressive Disorder (MDD). However, the relationship between adherence to the EAT-Lancet diet and psychiatric disorders, including MDD, remains largely unexplored. The objective of this study is to investigate the association between adherence to the EAT-Lancet diet and the incidence of MDD in a Swiss population cohort.

METHODS

Data from 1,966 participants (mean age: 58.8 ± 10.8 years, 47% female) of the CoLaus|PsyCoLaus study were analyzed. Dietary intake was assessed using a validated semi-quantitative food-frequency questionnaire. Adherence to the EAT-Lancet diet was scored based on recommended intake levels of 12 food groups, ranging from 0 to 39 points. Participants were categorized into low-, medium-, and high-adherence groups based on tertiles of the score. MDD was assessed at baseline and follow-up visits using the Diagnostic Interview for Genetic Studies (DIGS). Cox proportional hazards models were employed to evaluate the association between EAT-Lancet diet adherence and the incidence of a first diagnosis of MDD, adjusting for sociodemographic characteristics, behavioral factors, psychiatric comorbidities, and total energy intake.

RESULTS

Over a mean follow-up period of 9.2 years (SD ±3.4), 224 individuals received a first-time diagnosis of MDD. Higher adherence to the EAT-Lancet diet was associated with a non-significant reduction in MDD risk (medium adherence: HR 0.80, 95% CI: 0.59–1.11; high adherence: HR 0.74, 95% CI: 0.53–1.05, P for trend: 0.08) in the fully adjusted model.

CONCLUSIONS

In a Swiss population-based cohort, higher adherence to the EAT-Lancet diet showed a potential association with a lower hazard of MDD incidence. However, the findings were not statistically significant, highlighting the need for further studies with larger sample sizes to confirm this trend.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP56_10

SHAPING SUSTAINABLE FOOD CHOICES IN YOUTH: INSIGHTS FROM A COM-B MODEL SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

The present-day food system is a key driver of climate change and non-communicable diseases, making it imperative for populations to shift towards more sustainable and healthy food behaviours. Involving youth in this transition is vital as dietary habits are shaped during this period in life and will have long-lasting impacts. This systematic review explores the associations of capabilities, opportunities and motivations – derived from the COM-B model - with sustainable food behaviours among youth, identifying dominant factors and their interrelations.

METHODS

Four databases were searched for studies exploring at least two of three COM-B elements associated with sustainable food behaviours in individuals under 18. Sustainable behaviours included adopting a plant-forward diet, consuming local and seasonal foods, and minimizing food waste.

RESULTS

Twenty-three eligible studies were reviewed. Food preference emerged as the primary criterion for food choice, with cost also identified as an important factor. Familiarity and prior experiences with specific foods, influenced by social environments, shaped adolescents' food preferences. Parents were pivotal in introducing familiar foods, while schools expanded food exposure. This underscores the dynamic interplay between personal food preferences and external influences, emphasizing the significance of the social environment. Adolescents demonstrated basic skills and knowledge about general food behaviours but lacked the specific skills, knowledge, and awareness necessary to engage with sustainable and healthy food practices. Although animal welfare was mentioned—particularly by vegetarians—as a motivator for plant-based eating, sustainability was rarely cited, and awareness of sustainability issues was generally low. Knowledge and awareness did not consistently translate into sustainable eating behaviours, though some studies linked greater understanding of sustainable practices to more positive attitudes and food choices. Despite knowledge gaps, adolescents expressed a willingness to learn more about sustainable eating practices, indicating that education could play a key role in fostering sustainable behaviours.

CONCLUSIONS

Effective interventions must address multiple factors within the COM-B model, rather than focusing on isolated factors, to support a meaningful transition to sustainable food practices among youth. The findings provide valuable guidance for future research and the development of practical strategies to drive lasting change.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP56_11

DEMAND-SIDE FOOD POLICY STRATEGIES: THE EFFECT ON ENVIRONMENTAL SUSTAINABILITY, AND PROTEIN INTAKE IN ELEVEN EUROPEAN COUNTRIES

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BACKGROUND AND OBJECTIVES

Improving human and planetary health is one of the most important goals of current century. Demand-side food policy strategies can be implemented to improve human and planetary health. To develop and implement policy measures effectively, it is essential to conduct upfront analyses that demonstrate the potential impact of such measures. The objective of this study was to study the environmental impact of EU diets and investigate the potential of food policies focusing on simultaneously improve human and planetary health.

METHODS

Individual food consumption data from 11 European countries were used to assess the potential impact of demand-side food policy scenarios reflecting health and sustainability objectives. Dutch life-cycle assessment data were used to estimate six environmental impact indicators. Food composition data was used to estimate protein intake. Food consumption, dietary environmental impact and protein intake were estimated using the Monte-Carlo Risk Assessment software for baseline and established scenarios and comparisons were made for each country.

RESULTS

All countries showed potentially large reductions up to -55% in GHG emissions, land use, usage of blue water, and animal protein, and up to -70% for fresh and marine water eutrophication, acidification, when limiting meat intake and/or replacement with legumes or meat substitutes. Strategies such as replacing dairy with dairy substitutes, replacing soft drinks with water and limiting discretionary foods had less pronounced effects on environmental indicators ranging between -1 and -11%. Strategies increasing fruit and vegetable consumption negatively impact the environment impact up to 7%, and up to 14% for usage of blue water.

CONCLUSIONS

Demand-side food policy strategies can potentially simultaneously improve human and planetary health. The most promising benefits can be achieved by the reduction and substitution of meat with plant-based foods. This requires the implementation of a coherent set of measures with both forceful and soft strategies.

CONFLICTS OF INTERESTS
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OAP 59 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

OAP59_01

IMPACT OF REPLACING FOODS WITHIN DISH CATEGORIES OF JAPANESE FOOD-BASED DIETARY GUIDELINES ON NUTRITIONAL QUALITY, GREENHOUSE GAS EMISSIONS, AND DIETARY COST

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BACKGROUND AND OBJECTIVES

The Japanese food-based dietary guidelines (FBDG) define three main dish categories (grain, vegetable, and fish and meat), including foods with varying environmental impacts and prices. While guideline adherence is linked to better nutrient intake, it may not necessarily result in lower environmental impact or dietary costs. This study aimed to identify foods with higher nutrient density, lower greenhouse gas emissions (GHGE), and lower prices and examine the impact of replacing these foods within the main dish categories on nutritional quality, dietary GHGE, and dietary costs.

METHODS

The analyses were based on two-day dietary record data from 479 men and women aged 30–65 years who participated in the Saitama Prefecture Nutrition Survey 2017 and 599 foods consumed as home-cooked meals recorded in the dietary data. Based on the Japanese FBDG, the 599 foods were categorized into 14, 31, and 42 groups within grain, vegetable, and fish and meat dishes, respectively. These groups were further classified into three, four, and five clusters using hierarchical cluster analysis based on their Nutrient-Rich Food Index (NRF) 9.3 scores, GHGE, and price, respectively. Foods from clusters with lower NRF scores and higher GHGE and prices were replaced with those from clusters with higher NRF scores, lower GHGE, and lower prices at replacement levels of 25%, 50%, 75%, and 100% of the servings within each dish category. The impact of replacement was evaluated based on changes in the NRF 9.3 scores, GHGE, and dietary costs compared with baseline diets.

RESULTS

Cluster 1 of grain (rice), vegetable (potatoes, sweet potatoes, pulses other than soybeans, carrots, and cabbage), and fish and meat dishes (soybean products, eggs, sardines, and mackerel) was characterized by higher NRF 9.3 scores and lower GHGE and prices across all categories. The changes from the baseline diet, resulting from replacing foods with those from these clusters at 25%, 50%, 75%, and 100% of servings were as follows: NRF 9.3 scores increased by +5.9%, +11.8%, +17.4%, and +22.2%, GHGE decreased by -5.8%, -11.6%, -17.4%, and -23.2%, and dietary cost decreased by -5.2%, -10.3%, -15.5%, and -20.7%, respectively.

CONCLUSIONS

Foods with higher nutrient densities, lower GHGE, and lower prices were identified. Replacing foods within the three dish categories of the Japanese FBDG with these foods resulted in diets with improved nutritional quality, lower GHGE, and lower costs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP59_02

POTENTIAL CLIMATE CHANGE IMPACTS ON THE MINERAL CONTENT OF FARMED ATLANTIC SALMON

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BACKGROUND AND OBJECTIVES

Global warming poses significant risks to marine food production including aquaculture systems (IPCC 2023). Atlantic salmon (*Salmo salar*) represents the largest farmed marine finfish sector globally, with strong consumer demand and prized for its nutritional benefits (FAO 2024). However, an increase in seawater temperatures above salmon's optimal growing conditions (16–18°C) can cause physical stress, which affects metabolism and consequently the nutritional composition of the fish (Siciliani et al. 2023). This paper aims to investigate the effect of projected increases in seawater temperatures on the mineral composition of Atlantic salmon and the knock-on effects on consumer nutritional intake.

METHODS

Combining experiments that quantify the effects of water temperatures (15°C vs 20 °C) on the mineral composition of Atlantic salmon tissues with projected changes in sea surface temperatures by the end of the 21st century, we explore potential risks from climate change on the future mineral delivery from farmed salmon to human consumers.

RESULTS

Salmon reared at 20°C showed statistically clear changes in fillet mineral composition compared to those at 15°C, with higher concentrations of magnesium (Mg), sodium (Na), phosphorus (P), selenium (Se), and zinc (Zn) and lower concentration of iodine (I) - all critical for human health. Notably, iodine concentration decreased by 81% in the fillet of salmon from 20 °C, meaning consumers would need to eat five servings (100 g/serve) of salmon from 20°C to achieve equal iodine provided by one serving size of salmon from 15°C. Projections indicate a key salmon farming regions in Norway, Canada, and Tasmania are likely to experience ocean temperatures exceeding 20°C by the end of the 21st century, meaning a reduction of iodine if management of the fish stays the same. Using Tasmanian Atlantic salmon farming as a case study, we highlight the potential consequences of warming oceans on the nutritional quality of farmed salmon and its implications for public health.

CONCLUSIONS

These findings underscore a broader concern: as ocean temperatures rise, the declining mineral content in salmon may exacerbate existing nutrient deficiencies, reduce the efficacy of salmon as a dietary source of essential micronutrients, and challenge global food and nutrition security. Adaptive strategies to maintain product quality in aquaculture, such as increasing mineral content in salmon and other aquaculture feeds, will likely be crucial to mitigating these impacts and ensuring sustainable human nutrition in the face of climate change.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP59_03

COUPLED HEALTH, ENVIRONMENTAL, ECONOMIC, AND SOCIAL IMPACTS OF SHIFTING TO RECOMMENDED DIETS IN THE US

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BACKGROUND AND OBJECTIVES

Changes to federal nutrition guidelines have been proposed as an avenue to reduce the environmental impacts of diets while promoting population health. At the same time, sustainable healthy diets must also be affordable and ensure the well-being of workers and communities in food value chains (1). Previous research has examined the environmental impacts and costs of US recommended diets (2–4), but no research to date has analyzed impacts of dietary shifts across all four pillars of sustainability (5). The goal of this study was to estimate health, environmental, economic, and social impacts of shifting to four recommended dietary patterns in the US.

METHODS

Current dietary intake for US adults was estimated using two cycles of the National Health and Nutrition Examination Survey (2015–2016 and 2017–2018) (6,7). Recommended food patterns came from the 2020-2025 Dietary Guidelines for Americans (8) and the literature (9). Cardiometabolic (CMD)- and cancer-specific health outcomes associated with the intake of 18 food groups were calculated using a comparative risk assessment model. Environmental outcomes were assessed using life cycle impact assessment data and considered consumed, wasted, and inedible foods. Economic and social impacts were calculated using food cost and forced labor risk datasets, respectively.

RESULTS

Shifting to the four recommended patterns RESULTS in health benefits for both CMD and cancer, with the greatest reduction in adverse health outcomes for the Healthy Vegetarian (VEG) pattern, followed by the Healthy Vegan (VEGN) pattern. Concurrently, shifting to each of the four patterns RESULTS in increased water scarcity. Shifting to the Healthy-Mediterranean and Healthy-US Style patterns RESULTS in increased global warming potential (GWP), cumulative energy demand (CED), blue water use, food cost, and forced labor risk. However, shifting to the VEG and VEGN patterns result in reduced GWP, CED, and blue water use, as well as reduced cost and forced labor risk. The extent of change across outcomes is largely due to the underlying recommendations within each food group and the magnitude of difference between current and recommended intake.

CONCLUSIONS

This analysis highlights the benefits and tradeoffs of transitioning from current to recommended diets in the US based on a four-pillar framework of sustainability. Incorporating multiple dimensions of sustainability into the development of recommended diets can help achieve a transition to sustainable food systems.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP59_05

WOMEN'S DIETARY DIVERSITY AMIDST CLIMATE VARIABILITY: A COMPARATIVE ANALYSIS ACROSS EIGHT LOW- AND MIDDLE-INCOME COUNTRIES

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BACKGROUND AND OBJECTIVES

It is widely anticipated that climate change and climate variability will threaten food and nutrition security through multiple pathways. Because of this, measuring and monitoring global diet quality is of growing relevance. However, there is a dearth of evidence on the relationship between climate variability and women's minimum dietary diversity (MDD-W), especially in low- and middle- income countries (LMICs).

METHODS

We conducted hierarchical statistical modeling, fitted within a Bayesian framework, to investigate the impacts of climate variability on MDD-W, of 142,484 non-pregnant women, aged 15-49 years, in eight LMICs (Burkina Faso, Cambodia, Côte d'Ivoire, Ghana, Kenya, Mozambique, Nepal and Tanzania). Driver covariates included variability and anomalies of daytime and nighttime land surface temperature and precipitation (NASA's Moderate Resolution Imaging Spectroradiometer; Climate Hazards center InfraRed Precipitation with Station), total population and nightlights; food production covariates included nutrient yield, growing season and enhanced vegetation index; and individual and household-level covariates from Demographic and Health Surveys (DHS-8, 2020-2022). All analyses were analyzed and adjusted for the weights and sample design (with strata and clusters) for each survey separately, as the relationships between variables vary across surveys.

RESULTS

Across the eight countries, the proportion of women achieving MDD-W the previous day ranged between 20.8% (Mozambique) to 57.3% (Cambodia). The full model RESULTS suggest that climate variables showed significant negative associations with MDD-W, except for long- term precipitation variability in Nepal (Odds Ratio (OR) 1.13, 95% Credible Interval (Cl): 1.01, 1.25) and Mozambique (OR 1.24, 95% CI: 1.05, 1.46) and long-term variability in daytime land surface temperature in Mozambique (OR 1.21, CI: 1.03, 1.43). Few food production variables were significantly associated with MDD-W across countries. Individual-level variables were significantly positively associated with MDD-W in almost all countries, including women's education, employment, media access and land ownership. Household wealth was consistently associated with MDD-W in all countries.

CONCLUSIONS

These findings suggest that safeguarding women's diet diversity requires adaptation efforts that target vulnerable households to ensure nutrition. Future research should explore the impact of climate variability on MDD-W across spatial and temporal scales, and greater inclusion of food system covariates.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP59_06

NUTRITIONAL LABELLING TOWARDS HEALTHY AND SUSTAINABLE DIETS: AN ANALYSIS OF THE NUTRIENT PROFILING SYSTEMS PROPOSED AT GLOBAL LEVEL

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BACKGROUND AND OBJECTIVES

Nutrient Profiling Systems (NPSs) represent "the science of classifying foods based on their nutritional composition for the purpose of preventing disease and promoting health". These systems are quantitative algorithms to score food products based on the presence and/or the amount of nutrients or attributes classified as either beneficial or harmful: therefore, they have emerged as global, relevant tools for policymaking. In addition, to meet the urgent challenge of global warming and climate change, environmental labels have also been developed; however, environmental scores do not always overlap with nutritional ones, thus hampering consumer ability of making healthy food choices. Therefore, the aim of this study is to assess the correlation between different NPSs and environmental impact indicators, in order to understand to what extent NPSs agree with healthy and sustainable diets.

METHODS

Two databases were used in the study: the 2015–2016 What We Eat In America (WWEIA) NHANES survey based on 24-h dietary recalls and the Agribalyse 3.0, which comprises values of fifteen environmental indicators derived from Life Cycle Assessments. Products were further divided in twelve food categories. For each food item, a score was calculated using seven different NPSs: Food Compass Score, Health Star Rating, FSAm-NPS, Multiple Traffic Lights, Chilean Warning Label, Israeli labels, and NOVA classification. The Kendall's Tau test was used to determine the correlation of selected NPSs with environmental impact indicators of greenhouse gas emissions and use of resources by the agri-food system.

RESULTS

A sample of 775 food products was obtained by matching products from 8032 foods included in the WWEIA and the 2520 food items of the Agribalyse database. The majority of NPSs revealed negligible or weak correlations (i.e., Food Compass Score, Health Star Rating, and NOVA classification), while Chilean Warning labels showed a moderate correlation with Land Use only (τbLU=0.370, $p<0.001$). On the contrary, Multiple Traffic Light (τbGWP=0.262, $p<0.001$; τbLU=0.370, $p<0.001$), FSAm-NPS (τbGWP=0.296, $p<0.001$; τbLU=0.322, $p<0.001$), and Israeli labels (τbGWP=0.281, $p<0.001$; τbLU=0.300, $p<0.001$) displayed a moderate correlation with GWP100 and Land Use. As for the Water use indicator, all NPSs showed weak or negligible correlations.

CONCLUSIONS

The investigated NPSs revealed significant but moderate or weak associations with environmental indicators. Further research should focus on how to combine dimensions of health and sustainability into a unique NPS.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP59_07

EVALUATION OF THE KNOWLEDGE LEVELS OF ADULT INDIVIDUALS ON SUSTAINABLE NUTRITION

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BACKGROUND AND OBJECTIVES

Despite the rapid increase in the world population, the limited food resources lead societies to take measures for sustainable nutrition. For this reason, it is important for society to be aware of sustainable nutrition, which is defined as a diet that is sensitive to environmental effects and contributes to healthy nutrition today and in the future. The aim of this study is to evaluate the knowledge level of adults on sustainable nutrition.

METHODS

The study was conducted with 400 adult individuals between the ages of 19 and 64 years living in Ankara. The data were collected with a questionnaire form using the face-to-face interview technique. The questionnaire includes sociodemographic characteristics, nutritional habits, information questions about sustainable nutrition, and anthropometric measurements. In order to determine the level of knowledge on sustainable nutrition, a questionnaire consisting of 30 questions was prepared by reviewing the literature. The research data were evaluated in the SPSS package program by making appropriate analyses.

RESULTS

Participants in the study comprised 63.0% (n = 252) women and 37.0% (n = 148) men, with a mean age of 29.2 ± 11.6 years. 90.0% of the individuals stated that they buy fruits and vegetables according to the season for sustainable nutrition; 77.3% of them use processes such as freezing or drying for use in the following seasons. 70.6% of women and 29.4% of men have heard of the concept of sustainable nutrition before, and there is a statistically significant difference between genders ($p<0.05$). 63.9% of women and 45.3% of men reported that sustainable nutrition is important for a healthy world ($p<0.05$). 93.8% of the participants stated that they have heard of the concept of climate change and that climate change can cause famine, drought, and natural disasters. 48.6% of men and 61.1% of women stated that herbal nutrition is important for sustainability, and the difference is statistically significant ($p<0.05$). It was determined that nearly half of the participants knew the definitions of water footprint (40.0%) and carbon footprint (52.5%), and there was a statistically significant difference according to gender ($p<0.05$).

CONCLUSIONS

This study found that especially male individuals had lower knowledge about sustainable nutrition. It is essential for strategies and policies to be developed to increase the knowledge and behaviors about sustainable nutrition in society with the initiatives to be made on the subject.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP59_09

REPLACING RED AND PROCESSED MEAT, POULTRY, OR FISH WITH LEGUMES AND THE RISK OF GALLBLADDER DISEASES IN A LARGE BRITISH COHORT

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BACKGROUND AND OBJECTIVES

Legumes are promoted as a source of environmentally sustainable and healthful proteins. This study examined the association between substituting red and processed meats, poultry, or fish with equivalent amounts of legumes and the risk of gallbladder disease.

METHODS

Participants from the UK Biobank Cohort who had completed at least two 24-hour dietary assessments and provided complete covariate data were included. Data on age, sex, socioeconomic status, and lifestyle factors were collected at baseline, while dietary intake was assessed through repeated 24-hour dietary assessments. Incident gallbladder disease (including cholelithiasis, cholecystectomy, or cholecystitis) was identified through health registry records using ICD10 diagnosis and operative procedure codes. Cox Proportional Hazards regression models, adjusted for potential confounders, were used to estimate the hazard rate of gallbladder disease associated with replacing red and processed meats, poultry, or fish with legumes.

RESULTS

Over a median follow-up of 10.5 years (interquartile range: 10.4-10.9), 121,593 participants contributed 1,246,913 person-years, with 3,772 cases of gallbladder disease recorded. Substituting 80 grams per week of red and processed meat with legumes was associated with a slightly reduced rate of gallbladder disease (HR: 0.97, 95% CI: 0.95; 0.98, $p<0.001$). No significant associations were observed when replacing poultry or fish with legumes. Adjustments for BMI did not alter these findings.

CONCLUSIONS

Replacing red and processed meat with legumes was associated with a lower rate of gallbladder disease. Further studies in populations with higher legume consumption are needed to validate these RESULTS.

CONFLICTS OF INTERESTS

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OAP 68 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

OAP68_02

PROFILES OF EIGHT-YEAR TRAJECTORIES OF DIET-RELATED ENVIRONMENTAL PRESSURES

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BACKGROUND AND OBJECTIVES

Few studies have described the evolution of diet-related environmental pressures at the individual level, with greenhouse gas emissions (GHGe) and land occupation (LO) dominating the scientific literature. The present study aims to evaluate trajectories of the environmental pressures of diets over 8 years, a recent period in which awareness of the environmental crisis has increased.

METHODS

Dietary data were collected using a food frequency questionnaire distinguishing between organic and conventional foods in a sample that completed the questionnaire three times (2014, 2018, 2022). Environmental indicators at the farm perimeter were estimated for organic and conventional farming using a multi-source approach. Latent class models were used to identify trends in pressures related to food production, as well as in a synthetic Environmental Pressure Indicator (EPI) comprising standardized values for GHGe, LO, energy demand, agroecological infrastructure, water withdrawal, and pesticide footprint. Indicator trajectories were modeled using mixed models adjusted for energy intake and gender.

RESULTS

Over the study period (2014-2022), in the whole sample (n=8,905) environmental pressures, except for water withdrawal, decreased by 8-12%, with the EPI decreasing by 9.1%. Two to four distinct trajectory profiles were identified for individual indicator, with most participants showing stable or declining trends in pressures, except for water withdrawal, where two main profiles showed either increasing or decreasing trends over time. Globally, 4 different trajectories were identified for EPI. Dietary changes driving EPI variations included increased meat consumption among participants with rising EPI over time and increased plant-based consumption alongside reduced meat consumption among those with declining EPI over time.

CONCLUSIONS

This study highlights that, despite growing awareness of sustainable diets, most individuals maintained stable diet-related environmental pressures, with only a minority showing significant increases or decreases over the 8-year period. These findings emphasize the need for strong and urgent targeted public policies and communication strategies to promote sustainable dietary shifts, particularly by addressing sociocultural, economic and commercial barriers to environmentally sustainable diets.

CONFLICTS OF INTERESTS
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OAP68_03

SUSTAINABLE DIMENSIONS OF DIETS WITH VARYING LEVELS OF FOOD BIODIVERSITY IN A LARGE COHORT STUDY

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BACKGROUND AND OBJECTIVES

Dietary diversity has been associated with some health benefits. However, the concept of food biodiversity and its associations with different sustainability dimensions require further attention. We aimed to estimate the associations between dietary species richness (DSR), defined as the number of unique species consumed in individual diets, and various environmental pressures, dietary quality indicators and monetary cost.

METHODS

This study was carried out among 29,173 participants of a large cohort who filled in a 264-item food frequency questionnaire. ANOVA and ANCOVA models were used to evaluate the associations of overall, plant, and animal DSR (modelled as both quintiles (Q) and continuous variables) with environmental pressures (greenhouse gases emissions (GHGe, kg eqCO2/day), cumulative energy demand (MJ/day), and land use (LU, m2/day)), dietary quality indicators (the cDQI, reflecting the share of unhealthy and healthy animal and plant-based food in the diet, and the sPNNS-GS2, reflecting the level of adherence of national dietary guidelines) and monetary cost (€/day). The main model was adjusted for age, sex, and alcohol-free energy intake.

RESULTS

After adjustment, higher overall DSR was associated with reduced environmental pressures (GHGe, Q5 vs. Q1: -12.8%; energy demand, Q5 vs. Q1: -11.0%; LU, Q5 vs. Q1: -7.7%), and higher overall dietary quality (cDQI: Q5 vs. Q1: +29.1%; sPNNS-GS2, Q5 vs. Q1: +44.8%), while monetary cost of diets remained stable across quintiles. After further adjustment for animal DSR, higher plant DSR was related to lower GHGe, energy demand and LU (GHGe, Q5 vs. Q1: -25.8%; energy demand, Q5 vs. Q1: -17.1%; LU, Q5 vs. Q1: -20.7%), higher overall dietary quality (cDQI: Q5 vs. Q1: +13.6%; sPNNS-GS2, Q5 vs. Q1: +103.2%), and increased monetary cost (Q5 vs. Q1: +6.9%). On the other hand, after adjustment for plant DSR, animal DSR was associated with higher environmental pressures, lower dietary quality, and reduced monetary cost. Additionally, the share of organic food in the diet was positively associated with plant DSR and inversely associated with animal DSR.

CONCLUSIONS

Increasing DSR, and especially plant DSR, was associated with lower overall environmental impacts and better dietary quality, but led to increased monetary cost. The concept of food biodiversity is recent and its associations with various sustainability dimensions warrant further investigations in other settings.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP68_04

DO FOODS DISPLAYING SUSTAINABILITY LABELS ACTUALLY HAVE A LOWER ENVIRONMENTAL IMPACT? PREVALENCE AND ACCURACY OF SUSTAINABILITY LABELLING ON PACKAGED FOOD

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BACKGROUND AND OBJECTIVES

International guidance on packaged foods emphasises that labels should not mislead consumers. Consumer interest in the sustainability of their diets has seen a growth in the use of voluntary sustainability labels. However, concerns of 'greenwashing' have been raised worldwide, given many of these labels are unverifiable. The aim of this study was to analyse whether food products carrying sustainability labels were actually more sustainable than their non-label carrying counterparts using product-specific greenhouse gas emissions (GHGe) estimates.

METHODS

Labelling data on packaged food were collected at five Australian supermarkets. We determined whether each product displayed a sustainability label anywhere on pack. For all products, we calculated a 'Planetary Health Rating' (PHR), which summarises the estimated GHGe of a product through a rating between 0.5 (highest emitting products) to 5 (lowest emitting products). We then analysed whether products displaying a sustainability label had a higher PHR than their non-label carrying counterparts, overall and by product category.

RESULTS

In our sample of >27,000 products, around 1/3 displayed ≥1 sustainability label. There were 30 unique sustainability labels identified. Overall, products displaying sustainability labels had a higher mean PHR compared to unlabelled products (2.51 vs 2.09). By product category, the mean difference in PHR was the highest for meat and meat alternatives, and dairy product categories. For these categories, the mean PHR was higher for products displaying a sustainability label, driven by vegan labels displayed on plant-based alternatives in these categories. However, for the majority of product categories, the mean difference in PHR for labelled vs unlabelled products was indiscernible.

CONCLUSIONS

Products carrying sustainability labels may not be considerably more sustainable than their unlabelled counterparts. Given the limited regulation in this area, there is a risk unverified claims may mislead consumers. The wide variety of unique labels may also limit consumers ability to compare different products. Adopting lessons from nutrition labelling, a standardised government-led sustainability label may improve consumer trust and comparability across products as part of comprehensive policies to promote and healthy and sustainable food systems.

CONFLICTS OF INTERESTS

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OAP68_07

ORGANIC VERSUS CONVENTIONAL CONSUMPTION OF FRUIT AND VEGETABLES IN RELATION TO CANCER RISK: FINDINGS FROM A LARGE COHORT STUDY

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BACKGROUND AND OBJECTIVES

A regular consumption of fruit and vegetables (F&V) has been associated with health benefits, including lower risk of certain cancers. F&V consumption is also one of the main source of pesticide exposure in the general population. While higher organic food consumption has been related to lower pesticide exposure, it remains unclear if cancer risk varies with higher consumption of organic F&V compared to conventional F&V.

METHODS

This study aims to examine the association between the substitution of conventional F&V by organic F&V and cancer risk, in a large sample of adults, using detailed data on F&V consumption from a food frequency questionnaire distinguishing production METHODS. Using a residual methodological approach, the association between the substitution of conventional F&V by organic F&V, at fixed total F&V consumption, and cancer risk (overall and by location), was examined with Cox proportional hazards models for 100g replacement of conventional by organic F&V and for quintiles of replacement. In the main models, data were weighted for the national 2009 census data, and a large set of sensitivity analyses were conducted to improve causal inference.

RESULTS

A total of 30,981 participants were included in the analyses. During follow-up (mean (SD)=6.5 years (2.9)), 1,194 incident cancer cases were registered over 207,750 person-years. After confounder-adjustments (including anthropometrics, socio-demographics, family history of cancer, diet quality, lifestyle and total F&V consumption), substitution of conventional F&V by organic F&V was associated with lower risk of overall, colorectal and skin cancer, with HR (95%CI)=0.93 (0.90-0.96), 0.87 (0.79-0.96) and 0.90 (0.83-0.99) respectively, for an increment of 100g. After further adjustment for women-related risk factors, the substitution was also associated with a marked lower risk of postmenopausal breast cancer, with HR=0.76 (0.66-0.87) for the same increment. No association was detected for prostate, bladder, and lung cancer. Findings remained consistent after adjustment for the amount of ultra-processed food in the diet, or for the share of organic food in the diet, and considering another diet quality measure, or after removing early cases. The use of marginal structural model and inverse probability weighting METHODS did not substantially modify the findings. With unweighted data, substitution of conventional F&V by organic F&V was associated with a lower risk of postmenopausal breast cancer only.

CONCLUSIONS

The role of replacing conventional by organic F&V should be investigated in other settings.

CONFLICTS OF INTERESTS

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OAP68_10

DOSE-RESPONSE RELATIONSHIPS FOR ESTIMATING HEALTH IMPACTS OF DIETARY RISK FACTORS – AN UPDATE AND EVIDENCE SELECTION FROM THE NORDIC NUTRITION RECOMMENDATIONS 2023

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BACKGROUND AND OBJECTIVES

Dietary health impact assessment modelling is a valuable tool to provide decision-support evidence for population-wide dietary shifts, including sustainable diet transitions. These assessments rely on epidemiological evidence to estimate associations between exposure to dietary risk factors and disease incidence for a given dietary pattern. However, selecting evidence can be challenging for several reasons including a lack of systematic approaches to risk-outcome pair selection and ability to extract dose-response data from scientific papers. An aligned approach would allow for more robust assessments, better comparability, and increased harmonisation in the field. This work aimed to update the Nordic Nutrition Recommendations 2023 (NNR2023) evidence base, construct a database of extracted dose-response relationships, and highlight challenges of evidence selection.

METHODS

An update of the NNR2023 evidence was conducted by replicating the scoping review methodology provided in the NNR2023 background papers. Dose-response relationships were selected according to NNR2023 selection criteria (the commissioning body criteria was omitted) and certainty of the evidence. Non-linear relationships were replicated following a novel approach that used an online graphing tool (WebPlotDigitiser) to extract data points and then applying piecewise linear functions to the extracted points.

RESULTS

Eighteen new studies were added to the evidence base following the updated searches. From included studies (original NNR2023 and newly identified studies), 88 individual risk-outcome pairs were included, 22 of which were non-linear relationships. Linear functions and piecewise functions for non-linear relationships were compiled to create a dietary risk-factor database. When there was conflicting data for the same risk factor, a critical comparison was conducted to select the strongest evidence. Time and resource availability meant that replicating RESULTS of meta-analyses was not usually possible which led to the development of a standard piecewise function approach. There were also discrepancies between the NNR2023 and Global Burden of Disease Study; a comparison highlighting differences in food group designation and methodologies was constructed.

CONCLUSIONS

Selection and extraction of data to be used in dietary health impact modelling is an ongoing challenge for risk assessors. The constructed database and methodology applied to extract dose-response relationships aims to increase transparency and provide a standard approach for data selection in impact assessment, including sustainable diet investigations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 11 - FOOD SCIENCE, GASTRONOMY AND LIFE QUALITY

OAP11_01

The Effect of Different Cooking METHODS and Fat Types on the Estimated Glycemic Index Value of Potatoes

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BACKGROUND AND OBJECTIVES
The glycemic index (GI) concept is a beneficial tool for selecting carbohydrate-containing foods in achieving glycemic control. The GI value of foods is affected by different preparation METHODS as well as the botanical origin of the food. Also, heat-processed forms of potatoes, such as French fries, may pose health concerns due to high levels of fat and carcinogenic compounds. This study aimed to investigate the effect of different alternatives to deep-frying cooking METHODS and different fat types on the eGI value of potatoes.
METHODS

Potatoes were prepared by deep-fat frying (12 min, 190°C, 275 ml oil/100 g potatoes), air-frying (30 min, 200°C, 5 ml oil/100 g potatoes), and baking (30 min, 180°C, 5 ml oil/100 g potatoes), using sunflower oil (SO), canola oil (CO), olive oil (OO), and butter (B) (butter was only not used in the deep-fat fried samples). The proximity, starch fractions (rapidly digestible starch (RDS), slowly digestible starch (SDS), total digestible starch (TDS), resistant starch (RS), total starch (TS)) and according to glucose estimated GI (eGI(glucose)) of cooked potatoes were evaluated.

RESULTS
A comparison of the eGI values of the test foods revealed that potatoes air-fried with the addition of SO exhibited the lowest value (eGI(glucose)= 59.51). In contrast, potatoes baked with the addition of B demonstrated the highest value (eGI(glucose)= 74.96). The findings of this study indicate that the cooking method and type of oil used to prepare fried potatoes can influence the eGI of fried potatoes by up to approximately 15 units. It was determined that the potatoes prepared using SO exhibited a lower eGI value than other oil types in the air-fried and baked samples (for the air-fried and baked samples p=0,009 and p=0,000, respectively). When SO, OO, and B were used, air-frying resulted in lower eGI values than other cooking METHODS (p=0,023, p=0,038, p=0,003 respectively). This study also found a significant strong negative correlation between linoleic acid concentration of SO in fried potatoes and RDS and eGI (-0.61 $p<0.05$ and -0.77 $p<0.01$, respectively).
CONCLUSIONS
Since deep-frying may result in foods with a high-fat content, alternative METHODS such as baking or air-frying with the oil addition can be used instead. This study demonstrated that the eGI of air-fried and oven-baked potatoes was lower and similar, respectively, than that of deep-fried potatoes. In addition, the use of SO may be more appropriate for alternative METHODS of cooking potatoes, as it has a lower starch digestibility than other oils. The RESULTS may be important for individuals aiming to control postprandial glycemia.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP11_04

ASSOCIATION OF RED AND PROCESSED MEAT CONSUMPTION WITH DIABETES IN A REPRESENTATIVE SAMPLE OF U.S. ADULTS (NHANES 2003-2016)

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BACKGROUND AND OBJECTIVES

Greater consumption of red and processed meat has been associated with a higher risk of mortality and major chronic diseases including diabetes. The association between red and processed intake and diabetes remains unclear using a nationally representative sample of US adult population. This study aimed to examine the associations between red/processed meat intakes and diabetes among US adults.

METHODS

A total of 34,222 adult participants (mean (SE) age of 45.8 (0.3) years) of the National Health and Nutrition Examination Survey (NHANES) 2003-2016 were included. Total red meat intake included red meat and processed meat items such as beef, veal, pork, lamb, and cured meat and was estimated using 24-hour dietary recalls. Diagnosed diabetes was defined using any of the following criteria: self-report of diabetes diagnosis by a physician or other health professional, having a fasting plasma glucose level of 126 mg/dL or more, an HbA1c level of 6.5% or more, or use of anti-diabetic drugs. Multivariable surveylogistic regression models were used to examine the associations of total red meat, unprocessed red meat, and processed meat intake with diabetes, adjusting for potential confounders such as demographics, lifestyle, total calories, and other dietary factors. RESULTS were presented as adjusted odds ratio (aOR) and 95 % confidence intervals (CIs).

RESULTS

More than one-half of the participants (67.7%) were Non-Hispanic White, 52.4% women, and 14% were food insecure. After adjustment for sociodemographic factors, and other lifestyle and dietary risk factors including total calories, compared with the lowest quintile, highest quintile of total red meat, processed, and unprocessed red meats were positively associated with higher odds of diabetes with aORs of 1.78 (95% CI, 1.46-2.18), and 1.64 (95% CI, 1.31-2.05), and 1.34 (95% CI, 1.15-1.56), respectively (*P* trend for all <0.001). Substitutions of one serving of plant-based proteins, fish, eggs, and dairy per day for one serving of red meat per day were associated with a 12–16% lower odds of diabetes.

CONCLUSIONS

This study provides more evidence about the health hazards of red meat intake in relation with diabetes using nationally representative of the US adult population. Compared with red meat intake, other dietary components, such as plant-based proteins, dairy products, fish, and eggs, were associated with lower odds of diabetes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP11_05

SUPPRESSIVE EFFECT OF CEREAL ALBUMIN ON POSTPRANDIAL BLOOD GLUCOSE ELEVATION AND ITS PHYSICOCHEMICAL PROPERTIES

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BACKGROUND AND OBJECTIVES

Diabetes mellitus is one of the most serious diseases in the world because it leads to various complications. Most cases of diabetes are classified as type 2, and it is important for patients to control the elevation of postprandial blood glucose level by taking an appropriate diet. Wheat albumin is known to suppress postprandial hyperglycaemia due to its inhibitory effect on mammalian α-amylase. However, the functions of proteins from other cereals have not fully understood yet. In this study, albumins were extracted from cereals and their postprandial glycaemic effect and physicochemical properties were investigated to evaluate their potential application in functional foods.

METHODS

Albumins were extracted from cereals such as buckwheat, wheat, rice, barley, and rye. Then, these extracts were further purified by ammonium precipitation and dialysed against water. The inhibitory activity against α-amylase was evaluated by measuring the absorbance of chloro-nitrophenol at 405 nm produced from the cleavage of 2-chloro-4-nitropnenyl α-D-maltotrioside by α-amylase. The digestibility of cereal albumin was evaluated by SDS-PAGE and the retained α-amylase inhibitory activity after *in vitro* digestion. The thermal stability was determined by the retained α-amylase inhibitory activity after heating. Then, cereal albumins were administered to rats together with starch, and blood glucose levels were measured.

RESULTS

Buckwheat, wheat, barley and rye albumins inhibited mammalian α-amylase. On the other hand, rice albumin only inhibited the activity of insect α-amylase. Buckwheat and wheat albumin retained their high α-amylase inhibitory activity after heating. Buckwheat albumin was hydrolysed to peptides by digestive enzymes but retained its inhibitory activity even after digestion. The oral administration of buckwheat or wheat together with starch suppressed the postprandial blood glucose elevation in rats.

CONCLUSIONS

Buckwheat albumin suppressed postprandial hyperglycaemia after starch loading by inhibiting α-amylase activity. The high thermal stability of buckwheat albumin suggests its potential use in processed foods for which sterilization is required. Therefore, buckwheat albumin can be used in a variety of functional foods including bread and cakes to suppress blood glucose elevation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP11_06

"OPTIMIZATION OF STAPLE CEREALS WITH NUTRI-CEREALS TO ENHANCE NUTRITIONAL VALUE AND SENSORY APPEAL USING A D-OPTIMAL MIXTURE DESIGN: A FOOD-TO-FOOD FORTIFICATION APPROACH"

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BACKGROUND AND OBJECTIVES

Micronutrient deficiencies affect over two billion people globally, including a significant population in India, due to cereal-based diets lacking diversity and nutrients. Millets are rich in micronutrients, fiber, and bioactive compounds and thrive in diverse agro-ecological conditions, offering a promising alternative. This study aims to optimize a staple flour with nutri-cereals to improve nutrient intake, focusing on women of reproductive age (WRA).

METHODS

The grain-based blended flour formulations were designed using Design-Expert software (version 13, Stat-Ease Inc., USA), generating 19 formulations within specified constraints (10–80% for whole wheat flour (WF), finger (FM) and pearl millet (PM)). Four responses-Iron (Fe), Zinc (Zn), Calcium (Ca) and Overall Acceptability (OA)-were optimized to align with 15–20% of the Estimated Average Requirement (EAR) for WRA of India. Each response underwent statistical analysis to determine the optimal model, assessing the goodness of fit (R^2), and ensure adequate precision for design exploration. The sensory test was conducted in the 15 semi-trained panellists on the product Indian Flat Bread (*Paratha*) prepared using the blended flours. Multiple regression techniques were used with model mixture designs incorporating various mathematical models. Mineral content and sensory scores were analysed using Tukey's post-hoc test in SPSS (version 23, IBM, USA).

RESULTS

The mineral analysis of 19 formulated flours showed that higher FM and PM proportions significantly ($p < 0.05$) increased Fe and Ca levels. The Fe, Ca, and Zn content showed high significance in the linear model, with a $p < 0.0001$ and an R^2 of 0.98 while for OA it was represented by reduced cubic model. The optimized solution included 23.65 g of WF, 42.66 g of FM, and 33.69 g of PM. This optimized flour resulted in a measured Fe content of 4.20 ± 0.05 mg/100g, Zn content of 2.46 ± 0.05 mg/100g, Ca content of 158.14 ± 2.41 mg/100g, and an OA score of 7.04 ± 0.07 fulfilling 19-20% of the EAR for WRA.

CONCLUSIONS

The incorporation of staple flour with nutri-cereals resulted in a nutrient-dense flour that met 15-20% of the EAR for WRA, providing essential micronutrients like Fe, Ca, and Zn. This optimized product offers an affordable solution to combat micronutrient deficiencies and was well-accepted in the sensory evaluation. It has a potential of supporting growth and development as a local alternative to expensive commercial foods, particularly in resource-limited settings.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP11_07

UNVEILING THE POTENTIAL OF MORINGA LEAVES (MORINGA OLEIFERA): NUTRITIONAL PROFILING, RECIPE STANDARDIZATION AND SENSORY EVALUATION OF AN UNDERUTILIZED GREEN LEAFY VEGETABLE

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BACKGROUND AND OBJECTIVES

Moringa oleifera provides versatile products year-round, with its leaves being especially rich in protein, minerals and vitamins. While moringa leaf concentrates are popular as supplements and nutraceuticals, there is limited research done on incorporating moringa leaves in regular diets. Furthermore, the potential of using nutrient-rich moringa leaves for food-to-food fortification has not been fully explored. Therefore, this study aims to develop and standardize recipes using moringa leaves, analyse their key nutrients such as calcium (Ca), iron (Fe) and Vitamin A (Vit-A), their contribution to % Daily Value (%DV) and to evaluate their sensory acceptability among healthy adults.

METHODS

Moringa leaf samples were procured from five different local markets within the study area. The samples were pooled, washed, air-dried and were taken for nutritional profiling (proximates, iron, calcium and beta-carotene). Further, a few traditional Indian recipes were selected and substituted with Moringa leaves (fresh and dried forms) and standardised. A total of 12 recipes were prepared alongside their leafy and non-leafy control products. Affective sensory evaluation was conducted using a 9-point hedonic scale by 20 semi-trained institutional panel members. A score of >7 was indicative of a highly acceptable recipe. Descriptive statistics and one way ANOVA using post-hoc Tukey's test were performed for the sensory evaluation using IBM-SPSS software (version 23).

RESULTS

The nutritional profile of Moringa-based recipes was superior to their respective controls. The %DV for 100 g of the Moringa recipes ranged from 4.7 (Moringa Adai Dosa) to 38.1 (Dried Moringa Leaf Podi) for Ca; 6.1 (Moringa Pulao) to 78.4 (Dried Moringa Podi) for Fe and 35.6 (Moringa Adai Dosa) to 300.6 (Dried Moringa Leaf Podi) for Vit-A. The %DV of most of the recipes fall under ‘good to excellent’ source category (USFDA). The overall palatability score from the sensory evaluation ranged from 7.05±1.1 (Moringa Adai) to 8.2±0.7 (Moringa Rice) which indicates strong acceptance by the panel. Statistical analysis showed no significant difference, indicating equal acceptance of Moringa-incorporated recipes and their controls.

CONCLUSIONS

The findings suggest that incorporating Moringa leaves into traditional Indian recipes could serve as an effective strategy to enhance the nutritional quality of everyday meals while also offering potential for food fortification. Further exploration into the broader applications of moringa leaves in food-to-food fortification is recommended to optimize its health benefits.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP11_08

HARNESSING WASTE HEAT FOR GRAIN STORAGE: INSIGHTS INTO WHEAT QUALITY PRESERVATION OPTIMIZING WHEAT STORAGE WITH RECOVERED WASTE HEAT: A QUALITY ANALYSIS

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BACKGROUND AND OBJECTIVES

Climate change has intensified food loss, impacting farmers' incomes and food security. To tackle this, the innovative 'Hot and Cold Storage' system repurposes waste heat from cold storage for grain storage in a 'Hot Storage' room. The study evaluated its effectiveness of preserving grain quality and reducing insect damage.

METHODS

The study compared wheat stored in gunny bags of hot storage (Experimental-compartments I &II) and a room having ambient conditions (control). Freshly harvested wheat bought from the market was used for the study. The wheat was divided into one-kilogram gunny bags and was stored in three compartments for a year. Half of these bags were artificially spiked with 20 adults per kg of *Sitophilus oryzae* and *Ryzopertha dominica* each. Eighteen stored gunny bags were taken out every three months for analysis. A reading at 45th day was also included. A total of 93 samples were analyzed for parameters such as refractions, physiological weight loss, bulk density, hundred-kernel weight, weevilled grains, healthy grains, proximate composition, sugars, gluten, germination, fat acidity, and alcoholic acidity. Analyses were done in triplicates, and data were statistically evaluated using Kruskal-Wallis and Mann-Whitney U tests to study the effectiveness, and a 5% level of significance was considered for all the differences.

RESULTS

Samples were compared among the storage conditions and the 0th day reading at each time point. Hot storage showed significant ($P < 0.05$) changes in alcoholic acidity (0.10–0.12%), crude fiber (1.83–2.26%), and gluten (10.13%), all were within Indian food safety standards. Elevated temperatures reduced ($P < 0.05$) moisture (48.92%) and physiological weight (1.94–3.63%). Fat content increased ($P < 0.05$) in 90th- and 180th-day non-spiked samples but decreased ($P < 0.05$) in 270th-day spiked samples. In Ambient storage, infestation significantly ($P < 0.05$) impacted quantitative parameters, germination, weevilled grains, frass, crude fiber, alcoholic acidity, and moisture, even in non-spiked samples. Spiked samples showed additional ($P < 0.05$) significant changes in fat acidity, refractions, healthy grain count, and hundred-kernel weight, many exceeding permissible limits. Fat and protein changes were notable ($P < 0.05$) in some non-spiked ambient samples.

CONCLUSIONS

Hot storage shows potential to effectively resist insect damage and preserves grain quality better than ambient conditions over time.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP11_09

ESTIMATING NUTRIENTS INTAKE IN EQUATORIAL GUINEA: ELABORATION OF A NUTRIENTS CONVERSION TABLE

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BACKGROUND AND OBJECTIVES

Estimating nutrient intake is essential for assessing the general nutritional status of a population, particularly in countries where malnutrition or inadequate food intake may be prevalent. In the case of Equatorial Guinea, this analysis is especially important as no prior studies or published data on nutrients consumption exist. The objective of this study was to elaborate a Nutrients Conversion Table to allow estimation of nutrients intake from food consumption surveys.

METHODS

The Nutrients Conversion Table was designed following FAO and World Bank guidelines. A food list was created based on a nationally representative 24 hours recall survey among children under 5 years old. Nutrients composition was determined using eight Food Composition Tables (FCT) and Databases (FCDB) from culturally and geographically related countries, sourced via INFOODS for quality assurance. For foods without direct matches, average values were calculated, and specific attributes in some items required further averaging. Additionally, cooking METHODS were considered by applying refuse factors to adjust for nutrient changes during preparation. Foods were matched to their corresponding cooked forms in the FCT/FDBs, and retention factors were applied in specific cases to ensure accuracy. To enhance compatibility, FoodEx2 codes from European Food Safety Authority were assigned to each food item, enabling easier database matching and comparison with other NCTs. Six traditional recipes were also analyzed, broken into their ingredients using national sources and bibliographic references. Missing nutrient data was filled by cross-referencing similar items within the same FCT/FCDB or by consulting the same food in another FCT/FCDB from the previously utilized sources.

RESULTS

The resulting Equatorial Guinea NCT includes 213 foods, each with detailed information on energy and macronutrients, as well as on 29 micronutrients including vitamins, minerals, and other bioactive compounds. The first application of this NCT involved analyzing quantitative 24-hour dietary recall data from children under five. The analysis calculated average macro- and micronutrient intakes per child, offering valuable insights into dietary quality and highlighting potential nutritional deficiencies within this population.

CONCLUSIONS

This tool supports the development of public policies tailored to the nutritional needs of diverse population groups in Equatorial Guinea.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP11_10

"Barley Beta-Glucans Under the Lens: A Systematic Investigation of Beta-Glucan Variability in Barley Across Processed Forms and Indian Cooking METHODS "

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BACKGROUND AND OBJECTIVES
Barley, often termed the "poor man's crop," thrives in extreme climates, making it a resilient grain. Recently, barley has gained attention for its exceptional nutritional benefits, particularly beta-glucan—a soluble fiber that enhances satiety, regulates blood glucose, and improves insulin sensitivity. Recognized by EFSA for its health benefits, changes in beta-glucan content during barley processing remains poorly understood. This study aims to examine the beta-glucan content in pearl barley and its processed forms available in Indian markets and assess the changes in beta-glucan levels influenced by traditional Indian cooking METHODS.
METHODS
Pearl barley (PB) and processed forms like Barley Grits (BG), Barley Flour (BF), Barley Flakes (BFL), and Barley Puffs (BP) were sourced from nine sample points across three zones of Hyderabad, Telangana (India). All dried and powdered samples were analysed for macronutrients and Phytic acid content. Further, PB, BG, and BF samples underwent soaking and non-soaking pre-treatments. These were then subjected to four household cooking METHODS: Pressure Cooking (PC), Microwave Cooking (MC), Boiling (B), and Roasting (R). The raw forms and dried samples (after processing) were analysed for beta-glucan content, with statistical evaluation performed using one way ANOVA using post hoc Tukey's b test on IBM SPSS software (version 23).
RESULTS
The beta-glucan content of raw samples obtained from local markets ranged between 3.8 to 4.8 g/100 g (dwb), PB had lower value (3.87 ± 0.25) while BFL and BG had significantly higher levels (4.55 ± 0.08, 4.81 ± 0.81). After pre-processing and cooking METHODS, all three barley types demonstrated significant differences in beta-glucan content depending on the cooking method. The mean beta-glucan content after cooking was: PB: 5.13 ± 0.31 g/100 g, BG: 4.94 ± 0.41 g/100 g, BF: 4.50 ± 0.26 g/100 g which indicate increase from their raw counterparts. Among cooking METHODS, pressure cooking retained the highest beta-glucan content (5.07 ± 0.52), while roasting resulted in the lowest levels (4.68 ± 0.45). The ranking of beta-glucan values across cooking processing is as follows: Pressure cooking>Boiling>Microwave cooking>Roasting.
CONCLUSIONS

Beta-glucan is a functional nutrient that plays a vital role in blood glucose and diabetes management Identifying cooking techniques that preserve or enhance its content can contribute to preventive healthcare initiatives and help reduce the global burden of diabetes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 40 - FOOD SCIENCE, GASTRONOMY AND LIFE QUALITY

OAP40_01

IRON SPECIES AND SPATIAL DISTRIBUTION ASSESSMENT IN MICROALGAE FOR IRON DEFICIENCY ANEMIA PREVENTION AND TREATMENT

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BACKGROUND AND OBJECTIVES

Iron deficiency (ID) is the most prevalent micronutrient deficiency, affecting 24.3% of the global population, particularly women of reproductive age and children up to the school age(1,2). Prolonged ID RESULTS in iron deficiency anemia (IDA), with major health consequences and currently affects 16.4% of the world population. Dietary ID accounts for ~66% of IDA cases (2). The bioavailability of dietary ferrous (Fe2+) iron is higher compared to the ferric (Fe3+) form. Chelation with polyphenols and phytates reduce, whereas ascorbic acid enhances the iron bioavailability (3). New approaches are needed to mitigate the burden of ID and IDA. Microalgae are rich in minerals, particularly iron (could contain up to 100 times more than beef), and integration of microalgae in food products or usage as supplements is an alternative to reduce ID in affected populations (4). Iron is stored as Fe2+ or Fe3+ in microalgae, depending on species and bioassimilation (5). The objective of this study is to characterize iron species in *Arthrospira platensis (A. platensis)*, *Chlorella vulgaris (C. vulgaris)*, and *Galdieria sulphuraria (G. sulphuraria),* and analyze iron bioavailability from the microalgal biomass *in-vitro.*

METHODS

Mineral content is characterized by inductively coupled plasma – mass spectrometry(6). Iron speciation (Fe2+, Fe3+, complexation with ligands) and the distribution of iron will be (beamline time allocated in January 2025) analyzed by X-ray near edge spectroscopy (XANES) at the Diamond Light Source synchrotron (UK) (7). Ascorbic acid is quantified by high performance liquid chromatography (8). Polyphenols are analyzed with the bicinchoninic acid (BCA) method (9). Iron bioaccessibility was measured by INFOGEST 2.0 (10).

RESULTS

Iron content in *A. platensis*, *C. vulgaris, G. sulphuraria* was found to be 570.7 ± 15.9 mg/kg, 1137.7 ± 22.5 mg/kg, 1485.4 ± 29.2 mg/kg, respectively. Iron bioaccessibility for *A. platensis* was 19.3%, for *C. vulgaris* 4.4%, and for *G. sulphuraria* 9.0%. Polyphenol content is shown as quercetin equivalents (QE) and is 124.0 QE mg/L *for A platensis*, 129.6 QE mg/L for *C. vulgaris* and 94.5 QE mg/L for *G. sulphuraria*.

CONCLUSIONS

This work adds to the evidence of the potential microalgae as a novel source of iron for ID and IDA treatment and prevention. Furthermore, it provides evidence for future animal and human trials.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP40_04

A STUDY ON THE ASSOCIATION BETWEEN FOOD ADDICTION AND ULTRA-PROCESSED FOOD INTAKE AMONG CHINESE UNIVERSITY STUDENTS: THE MEDIATING ROLE OF MENTAL HEALTH STATUS

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BACKGROUND AND OBJECTIVES

This study aimed to investigate the prevalence of food addiction (FA) and its association with the intake of ultra-processed foods (UPFs) among Chinese university students, and to further analyse the mediating roles of anxiety, depression, and sleep conditions in it.

METHODS

Between September and December 2023, we collected general demographic information on 1866 study participants among college students in Chinese universities via electronic questionnaires; food addiction was assessed using the Yale Food Addiction Scale (YFAS) 2.0; intake of ultra-processed foods was investigated by the Food Frequency Questionnaire (FFQ); and anxiety, depression, and sleep status were assessed by the Generalised Anxiety Disorder Scale (GAD-7), the Patient Health Questionnaire (PHQ-9) and Pittsburgh Sleep Quality Index (PSQI) questionnaires, respectively. The relationship between demographic characteristics and food addiction was analysed by the $\chi 2$ test, and the U test was used to compare differences in daily intake of various types of ultra-processed foods between food-addicted and non-food-addicted groups, and to explore the mediating roles of anxiety, depression, and sleep in the daily amount of food addiction and ultra-processed food intake.

RESULTS

(1) Food addictions accounted for 8% of the college students surveyed, with 1.7%, 2.8%, and 3.5% having mild, moderate, and severe food addictions, respectively. (2) Grade level, major, ethnicity, anxiety, depression, sleep, and time spent on electronic screens were significantly associated with food addiction. (3) Daily intake of confectionery snacks ($P = 0.023$), puffed foods ($P = 0.038$), candied and dried fruits ($P = 0.025$), fast foods ($P = 0.013$), and refined cereals ($P = 0.042$) differed significantly between the food addiction and non-food addiction groups. (4) Anxiety and depressed mood had partially mediated effects in food addiction and fast food intake, with mediation shares of 25.2% and 27.3%, respectively; anxiety had fully mediated effects in food addiction and refined grain-based food intake. No mediating effect of sleep was found in food addiction and ultra-processed food intake.

CONCLUSIONS

Food addiction was significantly associated with ultra-processed food intake among Chinese university students, and anxiety and depression mediated the association between food addiction and specific ultra-processed food intake. The RESULTS of this study emphasise the importance of food addiction prevention and intervention in university student populations and suggest the role of mental health factors in nutritional interventions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP40_05

HOW TO LIMIT GLYCEMIC RESPONSE OF CEREAL BASED FOODS

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BACKGROUND AND OBJECTIVES

Carbohydrate-rich foods are the main contributors to postprandial glycemic excursions. The objective of the work was to limit glycemic and insulin responses by modulating the nutritional composition of cereal-based foods by increasing the slowly digestible starch (by controlling the food processes), or protein and fibers, or the lipid content.

METHODS

The data were obtained from four clinical trials which followed the same design to measure glycemic and insulin indexes (GI; II) on 12 healthy normal-weight subjects. Product portions provided 50g of available carbohydrates. *For the processing condition*, six cereal-based products were made twice with the same raw ingredients using three different food processes: rotary molding, dry bread making and extrusion. The main difference was on starch digestibility determined by the content of slowly digestible starch (SDS) (range from 1 to 15g/portion). *For improved nutritional profile* with higher protein and fibers contents, three commercial products were selected on their protein and fiber contents (from 6 to 29 and from 9 to 28, respectively). *For increased lipid content*, six extruded products were made with the same raw ingredients and only the lipid content was modulated from 1 to 7 g/portion.

RESULTS

The GI and II values for all the products ranged from 38 to 77% and 54 to 79%, respectively. For the different process conditions, the modulations of GI and II were from 41 to 70% and 54 to 79% respectively, with the lowest GI and II with both rotary molded products which had the highest SDS content. For the improved nutritional profile with higher protein and fibers content, the modulations of GI and II were from 38 to 59% and 68 to 75%, respectively, with the lowest GI and II for the cereal based product containing the highest protein and fiber content. For the increased lipid content, the modulations of GI and II were from 53 to 77% and 59 to 75%, respectively with the lowest GI for the cereal based product containing the highest fat content.

CONCLUSIONS

We demonstrated that several ways can be applied to decrease GI and II of cereal-based products. Indeed, maintaining high SDS content, increasing protein and fiber content or even increasing lipid content have been shown to limit postprandial metabolic excursions. Combining multiple approaches could be useful to modulate postprandial metabolism of cereal-based products including improved nutritional profile of these products.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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COMPREHENSIVE EXPLORATION OF THE ROLE OF DIETARY CAROTENOIDS INTAKES IN SARCOPENIA AND SARCOPENIA OBESITY

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BACKGROUND AND OBJECTIVES

Sarcopenia, causing physical function and mobility decline and higher risk of adverse outcomes, has been receiving increasing attention[1-2]. This study is designed to explore the role of carotenoids intakes in sarcopenia and sarcopenia obesity.

METHODS

A cross-sectional study was performed utilizing the 2011-2014 National Health and Nutrition Examination Survey. Participants included 5,122 adults whose carotenoids intakes were assessed by two 24-hour dietary review interviews. Low muscle mass measured by dual-energy X-ray absorptiometry was defined as sarcopenia with appendicular skeletal muscle mass/body mass index (ASM/BMI) based on National Foundation for Health Research[3]. Sarcopenia obesity (SO) was considered as BMI≥30 kg/m2 on the basis of sarcopenia[4]. Weighted logistic regression and weighted linear regression were quantified the relationship, multivariate cox regression and Kaplan-Meier curves were assessed mortality risk, and restricted cubic spline stratification was visualized the effect of carotenoids on mortality.

RESULTS

Total carotenoids, α-carotene, β-carotene, β-cryptoxanthin, lycopene, lutein/zeaxanthin intakes were all positively correlated with ASM and ASM/BMI, while all other carotenoids except lycopene were negatively correlated with fat mass index (FMI) ($P<0.05$). Carotenoids could affect body composition by increasing muscle mass and reducing fat. Meanwhile, total carotenoids, α-carotene, β-carotene, zeaxanthin/lutein reduced the prevalence of SO, only β-carotene and zeaxanthin/lutein reduced the prevalence of non-sarcopenia obesity and obesity ($P<0.05$). For an increase of one unit in the natural logarithm of total carotenoids, β-carotene, zeaxanthin/lutein, the prevalence of SO decreased by 17.52%, 27.23%, and 38.73%, respectively ($P<0.05$). The survival rate with high intakes of total carotenoids and β-carotene were higher than those with low intakes. For an increase of one unit in the natural log-converted β-carotene, the risk of all-cause death was reduced by 19.2% ($P<0.05$). Dose-response diagrams were used to visualize the association between β-carotene and all-cause mortality ($P<0.001$). There was U-shaped association between β-carotene and all-cause mortality in sarcopenia. Non-linear relationship was shown between the natural logarithm of β-carotene and all-cause mortality in SO, increasing β-carotene at lower levels significantly reduced the risk of death, and further increases above the threshold of 6.4175 microgram had less effect on the risk of death.

CONCLUSIONS

Carotenoids, especially β-carotene could promote muscle health and reduce mortality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP40_08

EVALUATING NUTRIENT VARIABILITY IN FINGER MILLET VARIETIES DUE TO DIFFERENT PROCESSING TECHNIQUES

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BACKGROUND AND OBJECTIVES

Millets stand out for their remarkable environmental resilience and rich nutritional profile. They thrive in extreme temperatures with minimal water and fertilizer, leaving a low carbon footprint, making them a sustainable choice. Finger millet (Eleusine coracana. L.), or 'ragi' in India, is valued for its high content of complex carbohydrates, dietary fibre, phytonutrients, essential amino acids, and minerals. It aids in preventing malnutrition, non-communicable diseases, and various other health concerns. While processing techniques reduce anti-nutrients, their effects on dietary fibre and phytonutrient content—especially across different varieties—remain unknown. This research aims to fill that gap by evaluating how processing METHODS impact the nutritional qualities of these varieties. To evaluate the effect of germination and roasting on the nutritional quality of finger millet, focusing on dietary fibre and phytonutrient content. To compare nutrient variability across three varieties and to identify the best processing method to maximize nutrient retention

METHODS

Three finger millet varieties—GPU-28 (red), GPU-67 (brown), and VL-Mandua-376 (light-brown)—were selected from the leading states in finger millet production. The grains were procured from ICAR-IIMR, Hyderabad, India. They were subjected to roasting (120 ◦C, 5min), soaking (24h), germination (24h, 48h, 72h) and a combination of germination and roasting (24h, 48h, 72h). AOAC METHODS were used for nutrient analysis and linear regression for statistical analysis

RESULTS

The findings revealed significant effects of processing techniques on the nutritional composition of finger millet. ($P<0.05$) VL-Mandua-376 exhibited the highest protein (8.81±0.01g/100g) and dietary fibre (13.23±0.26g/100g) content. Germination enhanced dietary fibre across all varieties with an increase in germination time. GPU-28 had the highest phytonutrient content, TPC (1552.40±4.70mgGAE/100g), TFC (1651.39±5.36mgCEQ/100g and Antioxidant (76.74%). However, germination constantly reduced these levels. The 48-h germination and roasting treatment showed the highest phytonutrient retention.

CONCLUSIONS

The study showed that processing techniques significantly impact the nutritional quality of finger millet. These findings suggest that optimizing processing METHODS can enhance its nutritional value, benefiting health-conscious diets, food industry applications, agricultural practices, consumer awareness, and updates to nutrient databases.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP40_09

DETERMINANTS OF ADHERENCE TO THE MEDITERRANEAN DIET IN EUROPE: THE DELICIOUS PROJECT

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BACKGROUND AND OBJECTIVES

The Mediterranean diet is considered a healthy dietary pattern associated with substantial health benefits. Its main features are strongly eradicated into the cultural heritage of populations living in countries facing the Mediterranean basin, but its preservation among younger generations is rather complex due to an abandonment of its funding principles and overall historical lifestyles. The aim of this study was to assess major determinants of adherence to the Mediterranean diet in 5 Mediterranean countries participating in the EU-funded DELICIOUS project.

METHODS

A multi-domain analysis has been performed on data obtained from a survey involving 2011 parents of children and adolescents living in Italy, Spain, Portugal, Lebanon, and Egypt participating in the project. Data obtained through validated instruments concerning personal (i.e., dietary and eating habits, lifestyle behaviors), family (i.e., parents believes, nutrition knowledge, barriers and enablers), and societal domains (i.e., food security) was analyzed via logistic regression analyses to assess the factors associated with higher adherence to the Mediterranean diet (assessed through the KIDMED test) in children and adolescents.

RESULTS

The average adherence to the Mediterranean diet was similar across participating countries, showing a rather low level (if considered in the context of Mediterranean populations). Higher adherence was embedded within a clear pattern involving higher physical activity level, adequate sleep duration, and healthier eating habits (frequent breakfast, eating at schools and with parents, lower preference for unhealthy ultra-processed foods). Also, parents' education and family economic allowance showed an association with adherence to the Mediterranean diet. Parents believes, barriers and enablers, capacity to seek information, and nutrition knowledge were all significant determinants of their children dietary choices. Finally, food security, especially in developing countries, also resulted associated with adherence to the Mediterranean diet.

CONCLUSIONS

Adherence to the Mediterranean diet is a component of a much more complex construct that involves the overall lifestyle, determined by family factors and the societal environment. Public health interventions to improve diet quality in children and adolescents living in the Mediterranean area should aim a comprehensive involvement of various targets in order to reach the desired goals.

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The authors have no conflict of interest.

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OAP40_10

THE ASSOCIATION BETWEEN FLAVONOID INTAKE AND PREVALENCE OF SARCOPENIA

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BACKGROUND AND OBJECTIVES

Chronic low - grade inflammation is one of the important pathogenesis of sarcopenia. It promotes muscle atrophy, stimulates protein catabolism and inhibits muscle synthesis. Flavonoids, which are widely present in plants, fruits and vegetables, have multiple benefits such as anti - inflammation and anti - oxidation. However, no study has clearly established the impact of flavonoid intake on sarcopenia. This study will be based on the NHANES and FNDDS databases to deeply analyze the relationship between flavonoid intake and sarcopenia, and reveal the potential role of flavonoids in the treatment of sarcopenia.

METHODS

This study uses the data from the National Health and Nutrition Examination Survey (NHANES) during 2017 - 2018. The participants include 1,998 adults, and the intake of flavonoids is evaluated through two 24 - hour dietary recall interviews. Weighted logistic regression and weighted linear regression are used to quantify whether the intake of flavonoids affects sarcopenia by changing muscle and fat in overweight and non - overweight populations. The Cox regression model and the Kaplan - Meier (KM) curve are used to evaluate the impact of flavonoid intake on survival rates under different disease states. In addition, the Weighted Quantile Sum (WQS) model is used to visualize the weights of the impact of flavonoids on sarcopenia. Missing variables are processed by multiple imputation METHODS.

RESULTS

1,998 participants (mean age 38)mean daily total flavonoid intake was 169.266 mg, lower in sarcopenia cases. Mean BMI was 28.915 kg/m², showing an overweight cohort.Weighted logistic regression showed flavones and flavonols affected sarcopenia risk. In overweight people, apigenin, luteolin and quercetin reduced risk; in non - overweight, luteolin and isorhamnetin did. Most sub - classes increased muscle mass ($P < 0.05$), and only apigenin and luteolin reduced fat mass after adjustment.Flavonoid intake cut death risk by 22.3% per unit increase ($P < 0.05$). In diabetes and diabetes - hypertension cases, higher kaempferol intake meant higher survival; in hyperlipidemia, higher luteolin intake did.The WQS model showed apigenin and kaempferol most influenced sarcopenia. These findings offer insights into flavonoids' role in sarcopenia.

CONCLUSIONS

Flavonoids can reduce the incidence of sarcopenia, especially apigenin.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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Global health and planetary nutrition

OAP 04 - GLOBAL HEALTH AND PLANETARY NUTRITION

OAP4_02

FROM ADVOCACY TO ACTION: CIVIL SOCIETY AND DEVELOPMENT AGENCIES ENGAGING PRIVATE SECTOR ACTORS FOR NUTRITION

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BACKGROUND AND OBJECTIVES

Private sector companies actions can affect the food security and nutritional status of populations. A number of civil society organizations are creating initiatives to influence private sector actions to improve nutrition at national, regional, and international levels, particularly in countries with triple burden of malnutrition. The objectives of this study were a) to identify and describe civil society led initiatives aiming to influence private sector action on nutrition (CSI-PSANs) b) to classify the initiatives based on the organizations approach towards engaging the private sector c) to understand their successes and challenges.

METHODS

CSI-PSANs were identified through an online search, supplemented with authors knowledge. Included: CSI-PSANs with International and/or Africa presence, focused on food manufacturers or retailers, led by NGOs or UN agencies, focused on increasing nutrition and food security through either Convening and Collaboration (CC) with the private sector, Capacity Building (CB) support to the private sector and/or Commitments and Monitoring (CM) of private sector nutrition commitments. Excluded: initiatives led by private sector, or primarily focused on agriculture or emergency. Publicly available information for these initiatives was reviewed, and a database identifying and describing CSI-PSANs was created. Semi-structured interviews with select CSI-PSANs were conducted to gain insights into their successes and challenges

RESULTS

48 CSI-PSANs were identified, of which 11 met the inclusion criteria. These initiatives were primarily focused on CC and CM (82%) and CB (63%). Key informants from 9 CSI-PSANs were interviewed. The successes of these initiatives varied, however all identified limited resources and short time frames to affect change as a constraint. Key recommendations were to design initiatives with an appropriate structure and right private sector partners, ensuring an aligned vision between partners, having a business case, ensuring governance processes, and regular communication with stakeholders to ensure transparency.

CONCLUSIONS

CSI-PSANs are increasing in number and operate through different approaches to influence private sector actions. This study is the first to identify, describe civil society initiatives focused primarily on nutrition and fills a knowledge gap on successes and challenges of civil society led initiatives engaging the private sector for improved nutrition.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP4_03

FEASIBILITY OF A MORE PLANT-BASED WEIGHT LOSS DIET IN OBESE OLDER ADULTS: THE 2EAT PILOT STUDY

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BACKGROUND AND OBJECTIVES

Older adults participating in weight loss interventions should ensure adequate protein intake to minimize the loss of muscle mass (1,2). Incorporating a more plant-based diet, in line with EAT-Lancet, into weight loss strategies may contribute to reduced environmental impact and lower risk of chronic diseases (3). However, plant-based foods have lower total protein content and quality compared to animal-based sources. The 2EAT pilot study aimed to assess the feasibility of implementing a protein-rich, more plant-based weight loss intervention for older adults with obesity.

METHODS

An 8-week pilot study evaluated the feasibility of the more plant-based weight loss intervention in older adults (55+ years) with obesity. Participants received nutritional counseling from experienced dieticians focused on 1) 500 kcal/d caloric deficit, 2) high protein diet (1.2 g/kg/d) and 3) 60% plant-based protein. Nutritional counseling included five counseling sessions, a cooking class and a recipe book. Feedback was collected through focus groups with participants and dieticians post-intervention. Values are expressed as mean (minimum-maximum).

RESULTS

Ten participants (63 years (55-71 y), BMI 34 kg/m2 (27-41 kg/m2)) completed the 8-week 2EAT pilot study. Energy intake decreased from 2008 kcal/d (1537-2680 kcal/d) with 20% to 1599 kcal/d (1145-1907 kcal/d), protein intake slightly reduced from 0.95 g/kg/d (0,6-1,2 g/kg/d) with 8% to 0.87 g/kg/d (0,5-1,2 g/kg/d) and the proportion of plant-based protein increased from 46% (31-65%) with 20% to 55% (34-76%). Participants experienced reductions in body weight from 96 kg (71-120 kg) with 2% to 94 kg (68-115 kg) and body fat percentage from 41% (27-56%) with 2% to 40% (28-55%). Both the participants and dieticians highlighted challenges in achieving a high protein intake while adhering to caloric restrictions. Social support was identified as a critical factor for participant success, and dieticians emphasized the need to prioritize behavioral changes within the intervention.

CONCLUSIONS

The 2EAT weight loss intervention based on a more plant-based diet appears feasible. However, high protein intake within an energy-restricted diet containing 60% plant-based protein remains a key challenge. The intensively supervised 2EAT intervention will be further optimized and evaluated in a randomized controlled trial, with a primary focus on 60% plant-based protein.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP4_04

STREAMLINING FUNDING ACCESS FOR PRODUCERS: ENHANCING FOOD SYSTEMS, COMMUNITY NUTRITION EDUCATION, AND HEALTHY BEHAVIORS IN UNDERSERVED COMMUNITIES

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BACKGROUND AND OBJECTIVES

Despite their critical role in agriculture and food production, BIPOC (Black, Indigenous, and People of Color) producers face significant barriers when applying for federal funding, including complex application processes and insufficient technical support, which limit their ability to build sustainable businesses. These challenges restrict access to fresh, nutritious food in rural and underserved communities, exacerbating food insecurity and chronic health issues. Additionally, past community nutrition education efforts have struggled to achieve lasting behavior change, further hindering public health progress. This study explores these issues by identifying key obstacles through focus groups and interviews, highlighting proposed solutions such as youth engagement and community partnerships to improve funding access, and examining how integrating community nutrition education with farmer success and expanded food access can drive consumer behavior change and improve health outcomes.

METHODS

To uncover key themes related to barriers and proposed strategies, approximately 302 focus groups and semi-structured interviews were conducted with BIPOC producers across the U.S. and its territories, using an inductive approach for analysis (Thomas, 2006). Additionally, a literature review of published studies from 2010 to 2023 was performed to explore the impact of combining community nutrition education with improved food access on consumer behavior and the prevention of chronic diseases

RESULTS

The study identified several key barriers faced by BIPOC producers, including overly complex application processes, inadequate technical support, and limited awareness of funding opportunities. To address these challenges, farmers proposed solutions such as engaging youth, fostering community partnerships, and simplifying the application process to improve access. These strategies, combined with efforts to empower BIPOC producers and expand food access through targeted nutrition education and community engagement, have the potential to enhance dietary habits and reduce the prevalence of chronic diseases in underserved communities

CONCLUSIONS

Empowering BIPOC farmers and involving youth and communities can improve food access, promote healthier behavior, and build resilient, equitable food systems essential for food security and stability amid global challenges like climate change and inequality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP4_05

PROTEIN ADEQUACY IN EUROPE: ADJUSTING CRUDE INTAKES USING THE PROTEIN ADEQUACY AND QUALITY SCORE (PAQS)

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BACKGROUND AND OBJECTIVES

Current mean crude protein intake in 20 European countries ranges from 0.8 to 1.25 g/kg/d (1). These intakes largely exceed the Estimated Average Requirement (EAR) for protein of 0.66 g protein per kg body weight per day. For European and other Western countries, a shift towards more sustainable diets would typically include more plant- and less animal-based foods, as the latter generally have higher environmental footprints (2, 3). As plant-based foods are also known for their lower protein quantity and quality (4), the diet shift necessitates careful evaluation of protein adequacy while considering protein quality. The aim of this study was to provide an overview of current protein intake and adequacy in European adults, based on crude or utilizable protein using individual-level food consumption data including information on meal moments.

METHODS

To assess the prevalence of inadequate protein intake in Europe, the Protein Adequacy and Quality Score (PAQS) was developed and applied to adults (18-64y) of 25 national dietary surveys obtained from the Comprehensive European Food Consumption Database of the European Food Safety Authority. The PAQS assesses protein adequacy as the ratio of daily utilizable protein intake to requirement, with utilizable protein calculated on a meal basis by considering protein digestibility, indispensable amino acid requirements, and crude protein intake. The inadequacy prevalence was estimated by applying the EAR cut-point method, adjusted for energy misreporting, within-subject variation, and non-normality, in SPADE.

RESULTS

The median crude protein intakes in Europe largely exceed the EAR (1.3-2.1 times higher). When applying the EAR cut point method after adjusting for energy misreporting, within-subject variation, and non-normality of the intake distribution, the maximum prevalence of crude protein inadequacy was 1.0% for women (United Kingdom) and 0.1% for men (Austria, Germany, and the United Kingdom). For utilizable protein, i.e. after applying the PAQS, inadequacy ranged from 0% (Spain) to 7% (Austria) in women, except for Germany (17%), and from 0% (Montenegro) to 6% (Germany) in men.

CONCLUSIONS

These findings suggest that with the current diet composition and quantity of protein intake there is no immediate cause for concern in the healthy adult European population, althought the inadequcies of women in Germany warrant closer investigation. The prevalence of protein inadequacy in more plant-based diets, remains uncertain. Therefore, protein quality must be carefully considered when evaluating protein adequacy of these future diets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP4_06

WHAT IS THE OPPORTUNITY COST OF FUNDING READY-TO-USE SUPPLEMENTARY FOODS COMPARED TO COUNSELLING FOR MODERATE MALNUTRITION?

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BACKGROUND AND OBJECTIVES

Commercially produced ready to use food supplements (RUF) improve outcomes for moderate acute malnutrition (MAM; weight-for-height z-score<-2) compared to routine care, but their use in isolation does not address the underlying causes of undernutrition. Well-delivered counselling may be as effective as RUF but requires substantial staff time; pilot work in Kenya found that staff spent an average of only 10 minutes per month with each carer of a child with MAM. We aimed to estimate the cost to individual country health systems of purchasing RUF, relative to employing staff to provide more generous counselling time and model the cost effectiveness of RUF compared to counselling.

METHODS

This was a cost effectiveness modelling study using secondary data. We identified 37 countries with rates of MAM greater than 5% from UNICEF / WHO / World Bank Child Malnutrition Estimates. Salary costs for nurses in each country were drawn from the Salary Explorer website and the cost of RUF from UNICEF supply division website. Data on effectiveness was drawn from 2 systematic reviews (1,2). A decision tree, of the pathway of a child receiving RUF compared with counselling was constructed to model cost per recovery and survival and disability adjusted life year (DALY). Distributions were fitted to reflect the considerable uncertainty in recovery, costs and disability weights.

RESULTS

The estimated monthly cost of RUF (1 sachet per day) was $8.22. The median average cost of one hour of registered nursing time was $2.70 per hour, and was less than the monthly cost of RUF for 84% countries. A systematic review (2) suggests that RUF is more effective (1:29, CI 1.19-1.40) but would cost ~$33 more per recovery and $1600 more per survival compared to one hour's counselling. Modelling DALYs increases the cost-effectiveness of RUF to within generally accepted thresholds, but with extensive uncertainty in those weightings associated with recovery, versus no recovery or relapse.

CONCLUSIONS

RUF appears to have higher efficacy, but significantly greater cost and may not represent value for money when it comes to longer term health outcomes. Well-staffed trials of the efficacy of problem-oriented counselling interventions for MAM, including detailed economic evaluation and cost-effectiveness are required, before the widespread adoption of treatment with RUF.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP4_07

FACTORS AFFECTING FOOD DIVERSITY, FREQUENCY, ADEQUACY AND GROWTH IN CHILDREN AGED 6-36 MONTHS IN CONFLICTED-AFFECTED MALI

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BACKGROUND AND OBJECTIVES
Child undernutrition remains a critical public health issue in West Africa, particularly in conflict-affected areas. In Mali, despite efforts to improve nutritional outcomes, undernutrition among under-5s remains very high, with data estimating 1 million children are at risk of acute undernutrition, and 200,000 of fatal outcomes. We assessed dietary quality via the achievement of the Minimum Acceptable Diet (MAD) and its components, Minimum Dietary Diversity (MDD) and Minimum Meal Frequency (MMF), and prevalence and risk factors for stunting, wasting, and underweight among 6-36 month-children in conflict-affected Mali. Qualitative data via focus group discussions (FGD) contextualized understanding and RESULTS.
METHODS

We analysed cross-sectional data from 6,440 children in 120 deprived communities, collected during a large RCT. Anthropometry used DHS methodology and data were transformed into z-scores with –2SD cut off for stunting/wasting. MAD, MDD and MFF were analysed according to WHO guidelines. Mixed-effects logistic regression explored risk factors spanning 27 child, maternal and household domains, including internal displacement, child disability, acute/chronic illness, sanitation/hygiene, vaccination and maternal empowerment. Topic guides for components of ~80 FGDs (mothers, grandmother, fathers, community elders) translated, transcribed, thematically coded included nutrition related context.

RESULTS
RESULTS revealed high rates of child undernutrition with 9% wasted, 22% stunted and 17% underweight. Only 26.4% (n=1,699) of children met MAD. Meeting MAD was not significantly related to growth. Factors improving MAD were maternal empowerment (OR=2; 95%CI: 1.4-2.9), urban residence, handwashing pre-feeding and older age (driven by MMF). Married to one husband and no acute disease were also associated with improved MMF, and soap with MDD. For wasting/stunting/undernutrition, negative factors were female sex, maternal empowerment, sanitation facilities (underweight/stunting only with a dramatic OR=0.19; 95% CI 0.05-0.69), and current breastfeeding (wasting only). Qualitative data (presented at conference) contextualised how some factors contributed to RESULTS.
CONCLUSIONS
RESULTS suggests that dietary practices alone do not sufficiently explain infant growth in this setting. Factors such as maternal empowerment, poor sanitation and risks with poor urban housing may play a more critical role in determining child nutritional status in this context, and which are not regularly a part of nutrition programmes.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP4_08

LONGITUDINAL ASSOCIATION BETWEEN WOMEN'S AGENCY AND HOUSEHOLD INCOME ON WOMEN'S DIETS IN RURAL BANGLADESH

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BACKGROUND AND OBJECTIVES

In South Asia, where women are known to eat last and least, determinants of women's diets and dimensions that constitute women's agency are poorly understood in the context of the region's socio-economic transition. Moreover, the assumption that women with greater agency have better nutrition outcomes for themselves has rarely been tested.

METHODS

Using two rounds of panel data from the 2011/12 and 2015 Bangladesh Integrated Household Survey (BIHS), we assessed the longitudinal associations of household income and women's agency on women's dietary quantity and quality and also examined effect modification between income and agency. We used single, multiple pass 24-hour recall data on a balanced sample of 3227 women of reproductive age (WRA) and assessed total energy intake to measure diet quantity, and women's dietary diversity score (WDDS) and consumption of animal source foods to measure diet quality. Household income was measured as per capita consumption expenditure and categorized into two groups, with fourth and fifth quintiles representing higher-income households. Because women's agency is a latent, multi-dimensional, context-specific construct, we used covariate-adjusted latent class analysis to identify latent, homogenous subgroups of women who manifested similar patterns of agency via self-determination, control over resources, decision-making agency, and freedom of movement. Fixed effects multivariable models were used to control for unobserved heterogeneity.

RESULTS

Latent class analysis revealed 3 classes of women's agency: women least likely to have any agency (class 1), women likely to have full agency in control over resources and some agency in other dimensions (class 2), and women with some agency in all dimensions except mobility (class 3). Across all outcomes, we did not find evidence for effect modification. Higher household income was independently and positively correlated with all three dietary outcomes, while agency class 2 had a significant but weak association with WDDS. Sensitivity analyses with uni-dimensional measures of agency and alternative measures of income also suggested greater influence of income on women's diets.

CONCLUSIONS

Our analyses demonstrates that compared to women's agency, improved household income has a stronger and broader influence on improving women's diets in rural Bangladesh. These findings suggest that efforts aimed at improving women's diets should address overall household income constraints and go beyond a sole focus on improving women's agency.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 16 - GLOBAL HEALTH AND PLANETARY NUTRITION

OAP16_02

DISASTERS AND THE COVID-19 PANDEMIC MAY NEGATIVELY IMPACT ON NUTRIENT INTAKES: AN ECOLOGICAL STUDY

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BACKGROUND AND OBJECTIVES

Previous research on the impact of disasters tends to focus on acute impacts and on low- and medium-income countries. Disasters may have a long-term impact on dietary intake patterns as part of the changes in the living conditions and environment. We investigated the long-term impacts of disasters and pandemics on nutrient intake using publicly available data from Japan.

METHODS

Nutrient intake data were obtained from Family Income and Expenditure Survey by Statistics Bureau of Japan. Meteorological data, namely the number of earthquakes, days over maximum wind of 10m/s and total rain, were retrieved from Japan Meteorological Agency. Data from 2007 to 2023 were curated for 47 prefecture capitals in order to match the data from both agencies. We defined 2020 as the onset of COVID-19. Expenditure data were converted to food and nutrient intake using food composition table published as a part of National Health and Nutrition Survey 2018 by Ministry of Health Labor and Welfare of Japan. A multiple regression analysis was performed to evaluate the cumulative impact of disaster on nutrient density in each city between 2009 and 2023. The output is expressed as a relationship between the nutrient intake per 2000 kcal energy intake and the cumulative frequency of disasters over the preceeding three years.

RESULTS

Analysis of individual nutrient intake levels revealed that COVID-19 and total rainfall impacted negatively affected nine and eight nutrients, respectively. The analysis also revealed that larger cities had higher nutrient intake compared to the smaller counterparts. Potassium, calcium and magnesium intake decreased with higher total rainfall, whereas zinc intake was inversely associated with earthquake. Sodium intake was reduced with COVID-19 and disasters. Vitamin A intake decreased with COVD-19 and with a higher cumulative earthquake and max wind however increased with higher total rainfall. Although the intakes for vitamin C decreased with COVID-19 and higher total rain, it increased with higher number of total earthquake.

CONCLUSIONS

The present study suggested the long-term impacts of pandemic and disasters on nutrient intake in Japan. Our analysis indicated that the impact differs depending on the type of disaster and type of nutrients. Limitations include the lack of data on other disasters and data specific to the township where the disaster impacted the most. Further research should focus on the impact of other disasters such as floods and data from other countries.

CONFLICTS OF INTERESTS

Taichi Inui is employee of dsm-firmenich, a manufacturer of vitamins and omega-3 LCPUFA

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OAP16_03

THE ASSOCIATION BETWEEN FOOD BIODIVERSITY AND MICRONUTRIENT ADEQUACY AND QUALITY OF DUTCH DIETS

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BACKGROUND AND OBJECTIVES

To bend the curve of biodiversity loss, food production and consumption practices should be more sustainable (1). The latter includes shifting our diets to plant-forward, nutritious and potentially more biodiverse diets. Food biodiversity, referring to the diversity of food species consumed within food groups, has been gaining attention for its potential association with human and planetary health (2). This study aims to assess the association between food biodiversity and micronutrient adequacy and diet quality in the Netherlands.

METHODS

Individual-level food consumption data of the Dutch adult population is obtained from the 2019-2021 Dutch National Food Consumption Survey (3). Nutrient composition is based on the Dutch Food Composition Database (4). Food biodiversity is operationalized as Dietary Species Richness (DSR): the number of species consumed by each individual per day. Micronutrient intake (in)adequacy is estimated using the Dutch Dietary Reference Values. Diets are evaluated using the summary estimate Nutrient Rich Diet score (NRD 15.3). Descriptive analyses according to quartiles of number of consumed food species and micronutrient intake will be performed. Multiple linear regression analyses will be performed to estimate the association between DSR (quartiles and continuously) and NRD.

RESULTS

Descriptive RESULTS of this study will show the average species consumption per day as well as the mean intakes and adequacies of micronutrients in the population. Statistical RESULTS of this study will show the association between DSR and NRD, both per quartile and continuously. Moreover, the role of plant versus animal food species in this association will be examined. For this, DSR for food groups vegetables, fruits, and grains will be calculated. We hypothesize that a higher DSR is associated with a higher micronutrient intake and overall NRD, and that this association will be mainly due to the higher consumption of plant food species. We therefore also expect a higher DSR to be associated with an increase in micronutrients such as fibre that are present mostly in grains, vegetables, and fruits, as well as a potential decline in micronutrients such as iron, vitamin B12, calcium, and zinc, present mostly in animal-based products.

CONCLUSIONS

We expect to conclude that a higher food biodiversity is associated with higher micronutrient intakes and better diet quality with higher nutrient density. Furthermore, we expect to conclude that DSR is an adequate, relevant and additional indicator to assess diet quality in a high-income country such as the Netherlands.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP16_04

NUTRITIONAL ADEQUACY OF HEALTHY AND SUSTAINABLE DIETS AT GLOBAL, REGIONAL, NATIONAL LEVELS AND BY DEMOGRAPHIC GROUPS: A MODELLING STUDY

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BACKGROUND AND OBJECTIVES

Healthy and sustainable diets, like the planetary health diet (PHD)1 rich in plant-based foods with moderate amounts of animal products, are key to improving health while reducing the environmental impact of food systems. Given the high prevalence of nutrient deficiencies, particularly among women and children, meeting nutritional requirements from the PHD is critical. This study assessed the nutritional adequacy of adopting the PHD across regions, countries, and socio-demographic groups.

METHODS

We obtained current dietary intake data from a newly developed global dietary database with sociodemographic details2, and created a hypothetical PHD intake scenario by adjusting the current amount of foods consumed in line with the PHD. We also constructed an optimised-PHD intake scenario by introducing aquatic plants and further increasing the proportion of green leafy vegetables. We estimated nutrient intakes from these diets by the combining the dietary intake datasets with nutritional content from the Global Expanded Nutrient Supply (GENuS) model3, the Harvard Nutrient Database, FoodData Central4, and the Japanese food composition table. We accounted for changes in the bioavailability of iron and zinc based on the nutrient composition of the foods consumed in these diets5,6. To assess nutrient adequacy, we compared nutrient intakes from these diets against a harmonised set of average nutrient requirements7. We then calculated nutrient adequacy ratios (NAR) as the ratio of nutrient intake to nutrient requirements, capped at 1.

RESULTS

Globally, the PHD would provide adequate nutrient intake to meet nutritional requirements for most nutrients, except iodine (NAR=0.7) and vitamin B12 (NAR=0.8), while the optimised-PHD would provide nutritional adequacy for all nutrients and across all regions, age groups, and sexes (NAR=1). In high-income countries, intakes of some nutrients, such as vitamin B12 and B6, in the PHD would be lower than current levels but remain adequate. In low-income countries, the PHD would provide higher intakes of many key nutrients compared to current diets and achieve adequacy, including folate, vitamin A, vitamin C and zinc. While the PHD may not fully meet the additional needs of women and children for iron (NAR=0.97) and riboflavin (NAR=0.96), the optimised-PHD would address these shortfalls.

CONCLUSIONS

Adopting the PHD can improve nutrient intake and reduce nutrient deficiencies while reducing chronic diseases and environmental impacts. Few nutrient shortfalls for some populations may persist which can be addressed by dietary optimisation for additional needs.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP16_05

ESTIMATION OF DIETARY SUGAR INTAKE USING SERUM CARBON ISOTOPE RATIO AS A BIOMARKER

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BACKGROUND AND OBJECTIVES

Cane sugar has a high 13C content, and this may allow the latter's use as a biomarker of added cane sugar intake. The specific biomarker is the serum bulk 13C isotope ratio (CIR), or the specific enrichment of 13C-alanine (CIR-ala). This study therefore aimed to evaluate the serum CIR and CIR-ala isotopic abundance as an estimate of the dietary intake of cane sugar in adult Indians.

METHODS

Daily energy and sugar intakes were measured by four 24-hour dietary recalls conducted over 2 weeks in 76 weight-stable adults, along with records of demographic and physical activity data. A blood sample was drawn at the end of the month for measuring serum CIR, and CIR-ala (δ13C ‰), with external quality control of serum CIR executed through the analysis of horse serum samples from the University of Alaska. The estimation of dietary energy intake (EI, as a proxy for sugar) was validated by measurement of daily Energy Expenditure (EE) in 26 individuals, by an accurate isotopic method using the Double Labelled Water (DLW), as the daily EE would be expected to match the daily EI in weight stable individuals.

RESULTS

There were 35 men and 41 women with a mean BMI of 24.7±4 kg/m2. From these, 3 dropped out, while a further 16 had under-reported their energy intake considerably, as assessed by pre-defined EE cut-offs from predicted Basal Metabolic Rate and Physical Activity. In the remaining 57, the median (IQR) total sugar intake was 54(42) g/day; added sugar intake was 27(25) g/day, with 12(11) g/day from sugar sweetened beverages (SSB). The validation of energy intake recall showed a small mean difference between EE and EI of -88 kcal/day, with wide limits of agreement, but no pattern to this difference at different energy intakes. The CIR, but not CIR-ala, was identified to be a predictor for total sugar and added sugar intake, (Beta: 17.36 g/d (5.86,28.86) and 12.8 g/d (2.92,22.64); P<0.003 and 0.012 respectively) but not for SSB. CIR was also associated with animal protein, fish and poultry intake [Beta 0.028 (0.012,0.043), 0.0059 (0.0002, 0.0117) and 0.0046 (0.0008, 0.0085; P<.001, 0.01 and 0.01 respectively)].

CONCLUSIONS

Serum CIR is a biomarker of total and added sugar intake in India, where the latter is cane sugar. Per the present RESULTS, an increase of serum CIR by a unit δ13C indicates an increase of 13g of added sugar in the daily intake.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP16_06

PERCEPTION OF PLANT-BASED MEAT SUBSTITUTES AMONG VEGANS

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BACKGROUND AND OBJECTIVES

The rise in veganism has increased consumption of plant-based meat substitutes (PBMS). Although PBMS offer alternative protein sources, their classification as ultra-processed foods (UPFs) raises concerns about potential health impacts when replacing traditional plant-based proteins (TPBP). The perception of vegans towards PBMS consumption remains largely unexplored. The aim of this study was therefore to explore the motivation and attitudes of Swiss vegans towards PBMS consumption.

METHODS

In a first step, the 50 vegan participants of the Swiss arm of the VEGANScreener study were invited to complete a follow-up survey approximately 10 months after their original study visit. Through quantitative questions as well as qualitative thematic analysis, motivations and attitudes towards PBMS were explored. Data collection is currently ongoing in the four other VEGANScreener countries Germany, Spain, Czeck Republic, and Belgium and data will be available at the conference.

RESULTS

In Switzerland, 34 participants completed the survey. While all of them have tried PBMS, 23 reported a preference for TPBP and only one person preferred PBMS; 10 reported no preference. The mean frequency of PBMS consumption was 2.1 ± 3.2 portions per week, while the mean frequency of consumption of TPBP was 12.7 ± 7.4 portions per week. None of the participants aimed to increase the consumption of PBMS, while 23.5% thought about reducing it. Furthermore, the majority (76.5%) rated the nutritional quality of PBMS as somewhat worse or much worse compared to TPBP, but PBMS were easily available to 94.1%. As key motivators for the consumption of PBMS we identified nutritional benefits, taste, versatility, convenience, tradition, and satisfaction, while barriers included health concerns about processing, cost, taste, and environmental impact.

CONCLUSIONS

While PBMS are consumed by vegans, frequency of consumption is generally low and the majority prefers TPBP over PBMS. Concerns were raised about processing, healthiness, cost, and environmental impact. Addressing these issues through product improvements and transparent communication may enhance acceptance. These findings inform public health recommendations and support developing PBMS that align with vegans' nutritional needs and values.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP16_07

Is habitual adherence to the planetary health diet associated with mortality and major chronic disease risk? RESULTS from the UK Biobank

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BACKGROUND AND OBJECTIVES

In 2019, the EAT Lancet commission proposed a globally applicable, sustainable, and healthy diet, the 'planetary-health diet' (PHD). The literature on the association between the PHD and the risk for health outcomes is sparse and diverse. With our study, we aim to add to the existing knowledge on the potential effects of the PHD on health outcomes by investigating the association between habitual adherence to the PHD and mortality and major chronic disease risk.

METHODS

Data of the large and population-based UK Biobank study cohort were used. A scoring system that reflects participants' habitual adherence to the PHD was defined based on the UK Biobank Oxford WebQ 24-hour dietary assessment data and by applying the Multiple Source Method (MSM; habitual dietary intake estimation)**.** Multivariate Cox proportional hazards regression models were fitted for the following health outcomes: all-cause mortality, cancer risk (all-cancer, female breast, colorectal, lung, and prostate cancer), and cardiovascular disease (CVD) risk (all-CVD, total stroke, ischemic stroke, myocardial infarction, and hemorrhagic stroke).

RESULTS

In our study, follow-up time ranged between 13.5 to 14.8 years depending on the outcome. Each 1-point increase in the PHD score was associated with a 3% lower risk of all-cause mortality (hazard ratio (HR) = 0.97; 95% confidence interval (CI): 0.96-0.99) and a 9% lower risk of lung cancer (0.91; 0.87-0.96). A trend between adherence to the PHD and all-cancer risk (0.99; 0.98-1.00) was also seen, while a null association between PHD adherence and CVD risk (0.99; 0.96-1.02) was found.

CONCLUSIONS

To the best of our knowledge, this is the first study estimating the association between habitual adherence to the PHD and mortality or chronic disease risk. Our RESULTS point towards an inverse association between habitual adherence to the PHD and all-cause mortality and cancer risk, although the associations with cancer depended on the cancer type. Our study provides additional evidence that sustainable diets can improve human health. Further studies are needed to investigate the link between PHD and chronic disease incidence and mortality in diverse populations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP16_08

BEEF INTAKE IS ASSOCIATED WITH LOWER DIVERSITY OF PLANT SPECIES CONSUMED BY THE BRAZILIAN POPULATION

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BACKGROUND AND OBJECTIVES

Food biodiversity plays a crucial role in promoting healthy diets and improving human and planetary health1,2. The diversity of species in diets has been positively associated with adequate micronutrient intake3 and negatively associated with all-cause mortality4. Diets rich in fresh plant-sourced foods has also been linked to lower risks of chronic conditions (e.g. cardiovascular diseases)5. Given the increasing homogenization of global diets, this study aimed to evaluate the association between beef intake and the diversity of plant species from Nova Group 1 (unprocessed and minimally processed foods) consumed by Brazilian households.

METHODS

Data from the 2017-18 Household Budget Survey were used to identify all foods and beverages purchased by household strata (n=575). Food items were classified according to the Nova classification system into: 1) unprocessed or minimally processed foods, 2) processed culinary ingredients, 3) processed foods, 4) ultra-processed foods. Food items were identified at the species level by using taxonomical classification. Species richness (SR) was used to assess the diversity of plant species from Nova group 1. Linear regression models adjusted for area, region and income were used to evaluate the association between the quintiles of the share of beef to total food acquisition (% of total kilograms/person/year) and the SR of plant species from Nova group 1. Test of linear trend was used to investigate the effect of beef quintiles as a single continuous variable.

RESULTS

A mean number of 60 (SD: ±0.96) plant species from Nova group 1 were consumed by the Brazilian population in 2017-18. The mean amount of beef acquisition was 13.7 kg/person/year (5.4% of total food acquisition), and the mean share of beef to total food acquisition varied between 3.2% (min: 0.0%; max: 3.8%) and 8.6% (min: 6.9%; max: 24.7%) in the first and fifth quintiles, respectively. The mean SR decreased linearly across quintiles of the share of beef to total food acquisition (coefficient: -1.19; 95% CI -2.09 to -0.28; *p* value for linear trend <0.05), decreasing from 61 in the first quintile to 57 in the fifth quintile.

CONCLUSIONS

Our findings demonstrate that beef consumption may play a key role in decreasing the number of plant species from Nova group 1 consumed by the Brazilian population. Such RESULTS reinforce the need of implementing policies to reduce excessive beef consumption in the Brazilian context in order to improve human health and biodiversity outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP16_09

A SYSTEMATIC REVIEW/META-ANALYSIS OF XENOBIOTICS IN APPLE AND APPLE-BASED PRODUCTS REVEALS LACK OF COMPLIANCE WITH EUROPEAN FOOD SAFETY AUTHORITY REGULATION

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BACKGROUND AND OBJECTIVES

Apple is an iconic and widely studied example of food-safety issues, resulting from the globalization of the fruit agro-food market. Many of the issues associated with xenobiotics used in the production of this fruit can be transposed to the most consumed fruit types in the world. The presence of xenobiotics in apples deserves a great keen interest in food toxicology, including published data on Maximum Residue Limits (MRLs).

Our data raises questions about the compliance with production regulation requirements and the effectiveness of controls. According to the criteria that define MRLs, we also wonder about the significant public health problems caused by the high rate of non-compliance.

METHODS

By using a systematic search in the Pubmed, Web of Science and Embase databases, we extracted 1374 publications on pesticides, mycotoxins, and heavy-metal contents in apple products, which represented 44%, 48%, and 26% respectively, of publications among the 4 most consumed fruits in the world. The publications were included in the review if they met 2 criteria: i) the presence of accessible quantitative data to be used in a common database, ii) the analysis of raw apples or any processed product in which apples are the main ingredient to limit cross-contamination. We selected 90 articles in which we were able to assess compliance with the European Food Safety Authority's (EFSA) regulations

RESULTS

We observed 42.8% overall rate of checks exceeding the MRL, 51.6% rate for pesticides, 42.6% for heavy metals and 40.2% for mycotoxins. Over 60% of the 92 pesticides considered were banned by the European Union. The rate of non-compliance was much higher in the Middle East (65.2%), Africa (50%), Asia (43.9%), Europe (37.5%) and South America (33.3%), than in North America (12.5%). We observed an influence of the climate Köppen classification and the 2024 Human Development Index (HDI) on the rate of exceeding MRLs.

CONCLUSIONS

The high frequency of abnormal levels of contaminants in apples and apple-products raises numerous questions applicable to other fruits, concerning compliance with production requirements, compliance with established rules, controls by national agencies and potential consequences for public health. Apples can be a vector of exposure for all age categories, as shown by analyses of apple-based products intended for young children.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 33 - GLOBAL HEALTH AND PLANETARY NUTRITION

OAP33_01

A NEWLY DEVELOPED NATURAL HOG CASING REDUCES THE SALT CONTENT AND THE OXIDATION OF CURED FERMENTED MEAT PRODUCTS

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BACKGROUND AND OBJECTIVES

The plan to reduce salt consumption through food intake is one of the main challenges posed by the different EU Member States. In the case of Spain, in 2008 the Spanish Food Safety and Nutrition Agency (AESAN) started a plan to reduce salt intake by 15%. Cured meat products are among the categories of foodstuffs identified as contributing the most to salt intake through the diet. The natural casings which preserve the cured and fermented meats are made from animal intestines. They are conserved in brine and although they are partially desalted prior to use, their salt content is very high. Other problems associated with the use of natural casings are unpleasant odours and excess rancidity. To try to overcome these problems, we developed a new type of natural casings (NNC) and we tested their effects in cured fermented sausages, compared with controls.

METHODS

We developed a NNC consisting of several layers of (manually) defatted intestine which were thoroughly desalted and dried (Especta®, United Caro). Traditional Spanish cured sausage ("salchichón") is a highly consumed sausage made with lean pork, pork fat, spices and salt. We investigated the effects of the NNC on the salt content and markers of fat oxidation of "salchichon" during the ripening process, compared with traditional hog casing controls (cular). For this, a production was carried out, using both types of casings, in a well-established factory of traditional "salchichón" (Splendid Foods, Seva, Barcelona, Spain).

RESULTS

The NNC contained 25 times less sodium than the traditional casing. The concentration of malondialdehyde (MDA) and the peroxide index (markers of fat oxidation) were 90% lower (0.72 ± 0.06 vs. 1.70 ± 0.09 mg MDA per Kg of fresh weight, FW) and 60% lower (1.98 ± 0.75 vs. 25.8 ± 1.88 mEq O2/Kg FW) in the NNC compared with the traditional casing, respectively. The cured fermented Spanish sausages produced with NNC significantly ($P<0.05$) reduced their concentration of MDA by 65% (0.46 ± 0.09 vs. 1.35 ± 0.31) and the peroxide index by 50% (6.21 ± 2.95 vs. 12.60± 2.75) compared with traditional casing. In addition, the salchichón made with NNC contained 16% less salt than the one made with traditional casing (4.20 ± 0.27 vs. 4.82± 0.27 g salt/100 FW).

CONCLUSIONS

The use of the newly developed natural hog casing for the production of cured fermented meat products reduced oxidation of the meat and could be useful for the reduction of salt intake in consumers.

CONFLICTS OF INTERESTS

Eduardo López-Huertas, José Rubí, Ana M. Haro and Isabel Seiquer have no conflict of interest. Piedad Pérez-Polaino and Ismael Heras are employees of United Caro Research and Development

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OAP33_02

COMMUNITY RESTITUTION OF THE TISA RANDOMIZED-CONTROL TRIAL ON WASH INTEGRATED TREATMENT OF SEVERE ACUTE MALNUTRITION IN SENEGAL

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BACKGROUND AND OBJECTIVES

Severe acute malnutrition (SAM) affects 17 million children worldwide. Uncomplicated SAM cases are treated in outpatient programs with varying recovery rates. The TISA trial in northern Senegal assessed whether adding a Water Sanitation and Hygiene (WASH) component to standard SAM treatment could improve recovery rates. To complement clinical findings, a community restitution was conducted in Linguère and Podor to gather feedback from institutional partners, community actors, and caregivers. Participants shared their perceptions on the WASH kit's impact, acceptability, costs, logistical challenges, and potential national integration.

METHODS

A predefined protocol guided the restitution sessions, using structured discussion guides. Participants, selected via purposive sampling, included mothers of enrolled children, nurses, health workers, community volunteers, local authorities, health representatives, and trial staff. Two sessions were held in Podor and Linguère. Institutional actors discussed RESULTS in French, followed by group work on four themes: water quality, diarrhoea reduction, SAM treatment outcomes, and WASH kit scalability. For caregivers and community health actors, discussions were conducted in Pulaar and Wolof, facilitated by a translator who recorded and transcribed exchanges. Two researchers conducted textual analysis triangulated by a third.

RESULTS

The WASH component was widely perceived as beneficial. Mothers reported reduced diarrheal prevalence, improved water quality, and better hygiene practices, particularly handwashing. Institutional and community actors noted behavioral changes and improved water conservation. However, limiting factors were identified: insufficient kit quantities for larger households, stock-outs, prolonged consultations, and storage constraints. The high cost of the kit was a concern, as institutional actors questioned its cost-effectiveness given the lack of significant impact on SAM recovery rates. Participants suggested increasing kit components, improving material quality (e.g., adding filters), extending the intervention duration, strengthening logistical support for community volunteers and broadening sensitization target by including religious leaders. Investment in permanent WASH infrastructure was also recommended.

CONCLUSIONS

The restitution highlighted the importance of community engagement in interpreting RESULTS and addressing operational challenges. It fostered local ownership, generated actionable insights, and informed policy discussions for potential national adoption.

CONFLICTS OF INTERESTS

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OAP33_03

COMPREHENSIVELY MEASURING FOOD ENVIRONMENTS TO INFORM INTERVENTION DEVELOPMENT: PILOTING THE FOOD ENVIRONMENT TOOLBOX IN INDIA AND CAMBODIA

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BACKGROUND AND OBJECTIVES

Food environments (FEs) drive consumers' decisions about what to eat. Characterizing the different domains (i.e., personal and external) and dimensions (i.e., accessibility, availability, affordability, convenience, quality, etc.) of FEs can facilitate better understanding of where people access food from and why, informing the design of interventions and policies tailored to the local context and people's lived experiences. The Food Environment Toolbox includes a suite of modified and refined tools designed to comprehensively assess diverse FEs in low- and middle-income countries. This study describes updates to tools, findings from the pilot of the FE Toolbox in India and Cambodia, and how findings can be used to monitor FEs and inform interventions and policies.

METHODS

The FE Toolbox includes seven tools to measure FEs in diverse LMIC settings: Participatory Mapping, Seasonal Food Availability Calendar, Food Environment Perceptions Survey (FEPS), Community Food Environment Mapping, Market Mapping, In-Depth Vendor Assessment, and a Cost of a Healthy Diet data collection protocol. We pilot-tested the tools in four communities, across an urbanicity gradient, in both India and Cambodia. The FEPS, which was designed to capture peoples' perceptions and experiences of their FEs (i.e., personal FE), was piloted with 60 participants in Cambodia and 44 in India. We also used a combination of tools to map the dimensions of the built FE (i.e., vendor type and hygiene, food availability, quality, promotions, prices) in each setting.

RESULTS

Based on our piloting findings from the FEPS tool, we found that the number of FE types accessed was significantly higher in rural (mean 2 ± 0.85 in Cambodia; mean 3.95 ± 0.92 in India) as compared to peri-urban (mean 1.7 ± 0.81 in Cambodia; mean 2.6 ± 0.97 in India) and urban (mean 1.2 ± 0.43 in Cambodia; mean 2.08 ± 0.76 in India) settings (p-value < 0.001 in India; p-value $= 0.02$ in Cambodia). Assessments of the built FE found differences in the foods sold across study settings as well as their quality (e.g., spoilage), relative affordability, and promotions. Promotions were observed in all FEs in Cambodia, particularly for alcohol, while promotions for ultra-processed foods were mostly observed in urban India.

CONCLUSIONS

The FE Toolbox provided insights into the different dimensions of FEs across settings and can lead to identification of context-specific points for intervening in the FE (e.g., alcohol promotion restrictions in Cambodia; strengthening market infrastructure in India) to improve the availability, affordability, and acceptability of healthy and nutritious food.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP33_05

THE IMPACTS OF VITAMIN A DEGRADATION ON THE EFFECTIVENESS AND COST-EFFECTIVENESS OF FOOD FORTIFICATION PROGRAMS: MODELED EVIDENCE FROM NIGERIA

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BACKGROUND AND OBJECTIVES

Vitamin A (VA) dietary inadequacy remains a serious public health problem, especially among young children. Large-scale food and condiment fortification programs are in place in many countries, but the potential for degradation of VA when exposed light, heat, and humidity may reduce the quantity of VA that reaches consumers. We modeled the impacts of different levels of VA degradation in three fortified products (wheat flour, sugar, and bouillon cubes) on program effectiveness and cost-effectiveness in the context of Nigeria.

METHODS

We used 2018-2018 Nigerian Living Standards Survey data to estimate apparent VA intake and prevalence of inadequacy among young children (6-59 months of age). We then predicted the potential reductions in VA inadequacy attributable to programs at varying hypothetical levels of VA degradation (zero loss to 80% loss). The Lives Saved Tool (LiST) was used to estimate child-lives saved based on changes in VA adequacy. Program costs were estimated using activity-based spreadsheet models.

RESULTS

Programs differed in their impacts on VA inadequacy: assuming zero VA losses, fortification of sugar (7.5 mg/kg), wheat flour (2mg/kg), and bouillon cubes (96 mg/kg) would reduce inadequacies among children by 3.3, 3.3, and 20.6 percentage points, respectively. VA degradation had negative, non-linear impacts on all programs: at 80% VA losses, these programs reduced inadequacies by 0.7 (sugar), 0.7 (wheat flour), and 9.6 (bouillon) percentage points. Over the zero-80% VA loss range, average annual child-lives saved over the 10-year model simulation period ranged from 3,984-769 (sugar), 3,036-739 (wheat flour), and 15,301-7,153 (bouillon cubes); estimated cost/child-life saved ranged from $550-$2,848 (sugar), $1,039-$4,271 (wheat flour), and $944-$2,018 (bouillon cubes).

CONCLUSIONS

VA degradation could reduce the effectiveness and cost-effectiveness of food and condiment fortification programs, perhaps undermining public policy efforts to address VA inadequacies where fortification programs are expected to contribute substantially to VA intakes. Fortificant selection, technological innovations in fortificants, and/or changes in premix handling and storage could help reduce degradation; all of these options would increase food program costs, but all merit consideration; some might be more cost-effective than others.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP33_06

DOES THE AVAILABLE OBSERVATIONAL EVIDENCE SUPPORT A RELATIONSHIP BETWEEN ADHERENCE TO SUSTAINABLE DIETARY PATTERNS AND MENTAL HEALTH IN ADULTS? A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

The rising burden of mental health disorders and planetary health are in the spotlight.1 Nutritional Psychiatry should advocate for dietary patterns that promote mental well-being while minimising environmental damage.2,3 Our systematic review aimed to explore how adherence to sustainable and healthy dietary patterns (e.g., Mediterranean diet [MedDiet], DASH, MIND, Eat-Lancet diet, Plant-based diet [PBD], Healthy Eating Index [HEI]) are related to common mental health disorders.

METHODS

We conducted a systematic search on 4 databases from database inception until Sept 2024. We followed the PRISMA and MOOSE recommendations for observational studies. We included prospective cohort studies that explored the longitudinal association between adherence to healthy low-environmental impact diets and depression, anxiety, cognitive decline or dementia among adults (≥18 y). When publications referred to the same cohort and the same exposure and outcome, we selected the most recent publication with the longest follow-up and the largest sample size.

RESULTS

A total of 40 studies involving 1,102,836 adults (mean age range: 34.4–80.7 y, 54.1% female) were included from 30 different cohorts. The mean follow-up was 10.3 y (range: 3–27 y). 24 studies explored MedDiet, 10 PBD, 7 DASH, MIND, and HEI, and 2 Eat-Lancet diet. The most explored outcome was incident depression (17 studies), followed by dementia (15 studies), cognitive impairment/decline (12 studies) and anxiety (2 studies). We broadly found that the highest adherence to these dietary patterns was related to a lower risk of mental health disorders.

CONCLUSIONS

Higher adherence to healthy and sustainable dietary patterns might be associated with a lower risk of common mental disorders. However, further research is needed to determine the effects of the latest diet indexes with the lowest environmental impacts according to evidence such as the Eat-Lancet diet to address public health strategies regarding mental health and planetary boundaries.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP33_07

RELATIVE VALIDITY OF INTERVIEWER-ADMINISTERED 24-HOUR RECALLS COLLECTED BY PHONE AND IN-PERSON VERSUS WEIGHED FOOD RECORDS IN RURAL SRI LANKA

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BACKGROUND AND OBJECTIVES

Quantitative dietary assessment is hindered by cost, time, and logistical burdens. Collecting 24-hour recall (24HR) dietary data by phone may be particularly advantageous in rural areas. We assessed the validity and costs of phone versus face-to-face (FTF) 24HR compared to standard observed weighed food records (WFR), a gold standard dietary assessment method.

METHODS

We used a randomized crossover design to collect one phone and one FTF 24HR from 103 rural Sri Lankan adults. Each 24HR was matched to a WFR collected on the reference day. We compared mean differences in log-transformed nutrient intakes (energy, 3 macronutrients, and 11 micronutrients) between 24HR and WFR using equivalence testing with a priori 15% error bounds. The same procedure was used to compare the relative error of the two 24HR METHODS. We also assessed agreement using concordance correlation coefficients (CCC) and Bland-Altman plots. Memory and portion size estimation errors were examined using descriptive statistics. Incremental financial and economic costs of phone and FTF 24HR recalls were estimated using activity-based costing, combining financial expenditure data with micro-costing.

RESULTS

Respondents underreported energy intake by 263 kcal (12.6%) and 229 kcal (10.9%) compared to WFR by phone and FTF 24HR, respectively. Mean intakes of protein, calcium, iron, zinc, riboflavin, niacin, and folate were equivalent between phone 24HR and WFRs. No nutrients were equivalent for the FTF 24HR. The CCCs between phone 24HR and WFR were higher than FTF 24HR for energy and all nutrients except calcium, riboflavin, folate, and vitamin B12. Memory error was lower in FTF 24HR. Portion sizes were underestimated in both recall METHODS. Costs per respondent were $337 for the phone 24HR and $498 for FTF.

CONCLUSIONS

Among rural Sri Lankan adults, phone-based 24HR were comparable to FTF 24HR in estimating nutrient intakes, although both METHODS underestimated true intakes. Phone-based 24HR dietary assessment performed at least as accurately as those conducted in-person and were notably less expensive. Further research is warranted to evaluate METHODS to improve food and portion size recall and accuracy of portion size estimation over the phone, in addition to validation of phone-based 24HR in other contexts.

CONFLICTS OF INTERESTS

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OAP33_08

INTEGRATION OF A WASH COMPONENT IN THE STANDARD NATIONAL PROTOCOL FOR TREATMENT OF SEVERE ACUTE MALNUTRITION IN CHILDREN AGED 6-59 MONTHS IN NORTHERN SENEGAL – A COSTING STUDY

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BACKGROUND AND OBJECTIVES

Severe acute malnutrition (SAM) affects 17 million children worldwide. Integrating a water, sanitation and hygiene (WASH) kit in outpatient SAM treatment has been shown to improve recovery rates, but its cost implications at scale is unknown. The study, conducted as part of the TISA trial, estimates the cost of integrating a WASH component into Senegal's national protocol for treating uncomplicated SAM.

METHODS

This costing study was nested within the TISA randomised controlled trial, which evaluated the additional benefit of a WASH component to standard SAM treatment for children aged 6-59 months. Data related to WASH costing were collected from 660 participants enrolled between December 2020 and December 2021. A societal perspective and micro-costing approach were used to estimate direct medical, non-medical (e.g. transportation) and indirect costs of SAM treatment.

RESULTS

The WASH component added a $105 additional cost per child treated, with the WASH kit, transportation and management representing $33. Sensitisation to hygiene and water treatment cost $13.4 at health posts and $30 for two at-home visits. Human resources were the main cost driver for the WASH component, exceeding the human resources for standard SAM treatment. However, this WASH component did not generate any additional out-of-pocket expenses to households. The cost for standard SAM treatment was evaluated at $233 per child treated (for an average of 6.4 consultations), with the main expense being Ready-to-Use-Therapeutic Food (RUTF) ($154). Household out-of-pockets cost amounted $43, corresponding to non-medical costs as treatment for malnutrition is included in Senegal's universal health protection. It also incurred $13.4 of opportunity costs for the caregiver. The absence of additional costs for households induced by the WASH component is encouraging, as suggest that is will not be an obstacle to care seeking or integration into the national protocol.

CONCLUSIONS

This study provides a comprehensive cost estimate for integrating a WASH kit and hygiene promotion into Senegal's SAM treatment protocol. While this increased the treatment cost by 45%, it remained lower than estimates from a previous study. These findings are critical for informing SAM management budget planning, supporting future cost-effectiveness evaluation, and guiding or preventing the integration of WASH interventions into SAM interventions in similar settings.

CONFLICTS OF INTERESTS
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OAP33_09

DICHOTOMOUS HEALTHY DIET INDICATORS TO REFLECT WHO DIETARY GUIDANCE

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BACKGROUND AND OBJECTIVES

Monitoring indicators of healthy diets, including those aspects of diets related to noncommunicable diseases (NCDs), is critical for public health to monitor trends and inform advocacy, policy and interventions. The World Health Organization (WHO) has published guidelines, recommendations, and evidence reviews on dietary risk factors for NCDs. The aim of this study was to develop and validate dichotomous food group-based indicators that reflect WHO dietary guidance.

METHODS

National quantitative dietary intake data from 8 countries (Bangladesh, Brazil, China, Mexico, Netherlands, Switzerland, United Kingdom, United States) were analyzed by classifying each food or beverage item consumed into 29 food groups used in the Diet Quality Questionnaire (DQQ). Candidate indicators were drafted from these food groups. Associations between food groups / candidate indicators and WHO recommendations were tested using odds ratios, correlations, and sensitivity and specificity analyses. Additionally, the sodium and free sugar content of salty and sugary food and beverage food groups were identified using the USDA branded foods database.

RESULTS

Indicators with significantly higher odds of meeting the WHO recommendations included the Protective Foods Indicator (PFI), associated with meeting the WHO recommendations for vegetables, fruits, whole grains, pulses, and fiber; and the Dietary Moderation Indicator (DMI), associated with meeting recommendations on free sugar, sodium, saturated fat, and processed meat. Sub-indicators on sugary foods and beverages and salty processed foods were associated with the WHO guidelines on free sugar and salt, respectively. An aggregate Healthy Diet Indicator is associated with meeting all the WHO recommendations.

CONCLUSIONS

These novel indicators are valid food group-based proxy indicators of adherence to WHO dietary recommendations. By measuring aspects of diet quality related to prevention of NCDs, they complement the minimum dietary diversity for women (MDD-W), a food group-based proxy indicator of nutrient adequacy. They are feasible to monitor at low cost using food group-level data. Using the DQQ, a 5-minute questionnaire, data suitable for calculating these indicators have been collected in 94 countries.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 50 - GLOBAL HEALTH AND PLANETARY NUTRITION

OAP50_01

PROTEIN-RICH PLANT-BASED DIETS: PERSPECTIVES OF ACTIVE OLDER ADULTS

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BACKGROUND AND OBJECTIVES

Older adults may require an increased protein intake to preserve muscle mass. A predominantly plant-based diet is beneficial for the climate and may lower the risk of certain non-communicable diseases. However, it may also lead to protein intakes below recommendations among older adults. This study seeks to elucidate facilitators and barriers in older adults adopting a diet that is both predominantly plant-based and provides sufficient protein to preserve muscle mass.

METHODS

Three focus groups were conducted with 30 active Dutch adults, aged 55-74 years. The focus groups explored participants' views on protein-rich, plant-based diets. Three researchers independently thematically analysed the data and facilitators and barriers were mapped to the Capability (C), Opportunity (O), Motivation (M) – Behaviour (B) model.

RESULTS

Health effects and taste were both the most dominant motivations regarding transition towards a protein-rich and more plant-based diet. Knowledge (C) and social influences (O) were important factors that influence dietary choices regarding the other COM-B model components. Environmental benefits (M) and animal welfare (M) were mentioned as additional benefits rather than as main facilitator. Participants expressed a clear need for enhanced knowledge and tools about the health and environmental benefits of protein-rich, plant-based diets.

CONCLUSIONS

This qualitative study revealed that health effects and taste were dominant drivers for active, older adults in the transition towards a protein-rich and more plant-based diet. According to their recommendations, targeted messaging on health benefits is essential. Additionally, improving taste perceptions offers an opportunity to foster more positive associations with plant-based diets.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP50_02

DUTCH STUDENTS OF SECONDARY VOCATIONAL EDUCATION AND PLANT-BASED EATING

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BACKGROUND AND OBJECTIVES

The transition to a plant-based diet is globally recognized as critical for combatingclimate change and improving public health (Willett, 2019). Secondary vocationaleducation students are a key demographic due to their adaptable eating habits (Story,2002). However, limited knowledge, skills, cost, and social influences often hinderplant-based choices (Rickerby, 2024). This study examines the eating habits, knowledge,motivations, barriers, and attitudes of Dutch secondary vocational education students towards plant-based eating.

METHODS

A consortium of researchers, educators, and public health professionals carried out this study. Based on the COM-B model (Michie 2011), semi-structured interviews were conducted amongst 156 students. A thematic analysis was applied to identify patterns.

RESULTS

Most respondents eat three main meals daily, with breakfast at home and lunch and dinner varying by location. Many live with their parents, who handle most grocery shopping and cooking. Dinners of potatoes, vegetables, and meat are common, with Italian and Asian cuisines also popular. A majority (83.7%) identify as omnivores, with smaller proportions as flexitarian or vegetarian; no respondents are vegan. Plant-based eating is most common in snacks (26.1%) and least in desserts (3.3%), with modest adoption for lunch (5.2%) and dinner (7.2%).

A third of students bring lunch from home, while others buy meals at school or supermarkets, favoring sandwiches and snacks. Only 11.8% consciously engage with plant-based nutrition, and 49% find it unimportant. Barriers include costs, limited options, and unappealing taste, though cheaper and better-tasting products might help.

Friends and family influence the eating habits of half the students, regardless of engagement with plant-based eating. While health and environmental benefits are recognized, fewer than half associate plant-based options with these advantages. Students more engaged in plant-based eating show higher motivation and are more likely to link it to positive outcomes in health, taste, and sustainability.

CONCLUSIONS

Plant-based eating holds little importance for most students interviewed. We found little evidence of resistance to the protein transition but also little interest. Most respondents eat what their parents cook and pay little attention to their diet's health or environmental impact. Interventions targeting parents and normalizing plant-based choices could increase adoption among this population.

CONFLICTS OF INTERESTS

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OAP50_03

GLOBAL VARIATION IN TAX POLICIES, SUGAR CONTENT, AND ANNUAL SALES VOLUME OF SUGAR-SWEETENED BEVERAGES

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BACKGROUND AND OBJECTIVES

Sugar-sweetened beverages (SSBs) are a leading source of added sugars in the global diet. High consumption of added sugars increases risks of chronic diseases including type 2 diabetes, obesity, and cardiovascular disease. Public health policies including taxes and nutrient warnings may improve national food systems by reducing sugar content of SSBs, thereby passively decreasing population-level intake of this nutrient of concern. However, there are no current studies of global variations of sugar content in SSBs, nor are there studies to combine these data with contemporaneous estimates of sales volumes, which are required to accurately compare average nutrient contents across national and regional food systems. The purpose of this study is to compare global differences in sugar content of specific SSBs and sales-weighted averages between 2019 – 2023.

METHODS

We collected data on sugar content (grams/100mL) and annual sales volume (million litres) for all available SSB categories between 2019-2023 within the Euromonitor International Passport (EIP) database, a third-party data aggregation platform used in similar studies. We calculated per-year per-country means and 95% confidence intervals of sugar content for each beverage category. Then, we calculated sales-weighted average sugar content in each country's respective SSB market. Finally, in forthcoming analyses completed prior to this conference, we will estimate differences between countries with respect to sugar content comparing those that do and do not have SSB taxes and front-of-pack nutrition labelling.

RESULTS

Regular colas contain the highest sugar content across all global markets, with a mean (95% CI) content of 33.3 (33.1-33.5) grams per 335mL serving. Energy drinks and orange carbonates contain similarly high levels of added sugars per serving, with significant regional variation. Overall sales-weighted average sugar content within SSB markets differed considerably, with Japan and the United Kingdom having less than 10 grams/335mL serving compared to India and the United Arab Emirates having more than 25 grams/335mL.

CONCLUSIONS

Significant regional variation of sugar content points to key global markets for public health intervention. High sugar content in regular colas, energy drinks, and orange carbonates highlights the importance of targeting these beverages for reformulation. Forthcoming analyses of the correlation between sugar content and relevant policies may further elucidate the need to improve interventions like SSB taxes to encourage industry reformulation.

CONFLICTS OF INTERESTS

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OAP50_04

ASSOCIATION BETWEEN ANEMIA AND SOYBEAN AND BAOBAB USE AMONG RURAL WOMEN IN NORTHERN GHANA: CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

Baobab, an abundant wild tree crop in Ghana is a good vitamin C source. Soybean has high iron content and is the only plant-based complete protein available in Ghana. Women in rural smallholder farming communities have an increased risk of anemia related to food insecurity and inadequate dietary quality. The study objective was to assess the effects of soybean and baobab consumption on hemoglobin levels among rural women in Ghana.

METHODS

In this cross-sectional study, in-person interviews were conducted with questions on 1) demographic data, 2) 7-day recall of the 10-item food group scale used for dietary diversity, and 3) soybean and baobab-related knowledge, access, use, and recipes. 4) Food security using the Household Food Insecurity Access Scale, and 5) Hemocue to assess hemoglobin levels. Means, standard deviation, chi-square analysis, and linear regression were computed using IBM SPSS, version 29. A market surveillance was done to identify baobab and soybean-related products at three main markets.

RESULTS

Of the 150 mothers, 95 (62.5%) had no formal education, 22 (14.5%) had completed primary education and the remaining 33 (22.0%) had completed senior high school/tertiary education. The mean hemoglobin level was 11.2 ± 1.8 g/L for women. A third (n=53; 34.9%) of the mothers were non-anemic, while the remaining 90 (60.0%) had mild to moderate anemia. In almost all households 148 (97.4%) in the sample had access to a baobab tree, and 78 (51.3%) farmed soybeans. Soy kebab and soy ice cream were the most common soy products identified by market surveillance. Soymilk and yogurt were however the most popular in households and markets. In the one week before the study, 28 (18.4%) had consumed baobab pulp juice, 107 (70.0%) had used baobab leaves for soup and 68 (44.7%) had consumed soy kebab. Controlling for food security status, the use of soybeans one week before the study was significantly related to anemia status (p=0.035). However, access to a baobab tree, farming soybeans, reported use of baobab, and intake were not associated with anemia status. Few mothers reported their knowledge of soybean and baobab as “good for general health”, while others reported that, they used the pulp as a laxative, used pulp as animal feed, disposed of it, or did not know the health benefits.

CONCLUSIONS

Soybean intake but not baobab was significantly associated with anemia status. Baobab and soybean were available but minimally used at household levels. Larger-scale intervention studies are needed to determine their benefits in food-based anemia prevention strategies.

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The authors have no conflict of interest.

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OAP50_06

NAVIGATING ANTAGONISTIC OUTPUTS IN A LONG-TERM MULTI-INSTITUTION AND MULTILINGUAL NUTRITION RESEARCH PARTNERSHIP

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BACKGROUND AND OBJECTIVES

International nutrition research partnerships, which involve diverse linguistic and institutional contexts, face complex collaborative challenges. This study examines a four-way partnership between institutions in both the global North and South that offer a graduate nutrition research program. It specifically explores how partners navigate and learn from contested outputs of the program within the partnership.

METHODS
Using the Bergen Model of Collaborative Functioning (BMCF), we conducted a formative evaluation employing a Participatory Action Research (PAR) approach. We used purposive sampling to recruit members of the partnership for participation. Data collection METHODS included cognitive mapping and restorative justice group exercises, which were analyzed through inductive thematic network analysis using NVivo v15.
RESULTS

The key challenges identified by the partners included issues surrounding supervision, roles and accountability, and sustainability. Supervision was found to be critical, significantly influencing research quality and student outcomes. Problems included miscommunication, varying supervision models, and language barriers between supervisors and students. Institutional role ambiguity, hierarchical structures, and uneven decision-making processes further complicate the effectiveness of the partnership, leading to delays and a lack of accountability. Concerns regarding sustainability highlighted the need for alternative funding mechanisms after initial partnership funding has ended. However, embedded within these challenges are long-standing tensions in communication and differences in contexts of the different institutions that had the overall impact on productivity and expected outcomes of the partnership.

CONCLUSIONS

The findings emphasize the significant influence of communication and contextual differences on the functioning and outcomes of global health research and nutrition research partnerships. Addressing these challenges with targeted strategies can enhance collaboration, ensure sustainability, and improve research outcomes for future partnerships.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP50_07

INFORMALITY IN THE FOOD ENVIRONMENT: A REVIEW OF NUTRITION, LIVELIHOOD, AND SOCIO-POLITICAL CONTEXT AND IMPLICATIONS FOR FOOD POLICY

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BACKGROUND AND OBJECTIVES

Over one billion people in low- and middle-income countries (LMIC) work in the "informal" food system. Street and mobile vendors are often part of the informal sector and contribute to food environments critical for the food security, safety, and resilience of low-income populations. Despite the role that informality plays in the food environment in LMIC, there is little systematic research on how informality in the food environment impacts nutrition livelihoods, given various socio-political context. This scoping review addresses these gaps.

METHODS

We undertook a scoping review (OSF registration:https://doi.org/10.17605/OSF.IO/YMK3T) that addressed three key questions about informality: 1) How is informality in the food environment defined and studied? 2) What factors in the informal food environment influence consumer food choices, diets, and nutrition outcomes? 3) How do socio-political factors, such as bribes, personal safety, regulations, and governance affect informal food vendors? A search strategy was developed in July 2023. We included English-language studies published after 2000 on informal food environments in LMIC with outcomes related to nutrition, or livelihoods, or socio-political contexts.

RESULTS

The search yielded 23,250 records, with 12,294 remaining. From these, 1,870 records were selected for full-text screening. A total of 358 records were included for data extraction and analysis after applying the inclusion/exclusion criteria, with over 95% being peer-reviewed articles. The studies covered 56 countries, with clusters in South Africa, Kenya, India, and China. Most research was conducted in urban or capital city settings (73%); less than 10% focused on peri-urban areas, and fewer than 7% on rural or secondary cities.

Preliminary RESULTS show that a quarter of the papers studied all three outcomes (nutrition, livelihood, and socio-political context), with less than 15% focusing on nutrition. Commonly studied commodities included prepared foods, vegetables, and meat; commonly studied socio-political factors included governance, gender, water, sanitation, and public space use. Livelihoods focused on business challenges and vendors' working hours. Most common FE dimensions included vendor characteristics and food availability, convenience, and prices.
CONCLUSIONS

Informal food environments are essential for LMIC countries, though their importance is often overlooked. These environments serve as critical nutritional and economic hubs in urban areas, shaped by socio-political contexts and rooted in economic histories.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP50_08

DISPARITIES IN MICRONUTRIENT DEFICIENCIES, INFLAMMATION, AND THEIR CO-OCCURRENCE IN RELATION TO ADVERSE BIRTH OUTCOMES: THE BRINDA PROJECT

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BACKGROUND AND OBJECTIVES

Maternal micronutrient deficiencies (MNDs) and inflammation contribute to adverse birth outcomes (ABOs). The consequence of co-occurrence of MNDs remains unclear. Identification of factors associated with higher prevalence of MNDs and inflammation can also help improve maternal health care. The study examined disparities in maternal MNDs and inflammation, as well as associations of 1) single MND and inflammation and 2) co-occurring MNDs with ABOs.

METHODS

Data from 9,567 pregnant women across 8 datasets from 7 countries were assessed for baseline prevalence of MNDs (including iron, vitamin A, zinc, serum folate, vitamin D, and vitamin B12), inflammation (c-reactive protein >5 mg/L or α-(1)-acid glycoprotein > 1g/L). Associations with maternal demographics (age, height, body mass index [BMI], education, socioeconomic status [SES]) using chi-square. Associations of 1) single MNDs and inflammation and 2) co-occurring MNDs (2 deficiencies at a time) with low birth weight (LBW, < 2500 g), preterm birth (PTB, < 37 wks), and small-for-gestational age (SGA, < 10th percentile for gestational age), were examined using modified Poisson regression to estimate Relative Risk (RR), adjusting for age, SES, and dataset.

RESULTS

Younger age and shorter height were associated with up to 10% and 25% higher prevalence of MND and inflammation. Maternal underweight was associated with lower inflammation (23.9% vs 35.5%), while lower education (64.6% vs 41.5%) and lower SES (56.1% vs 47.7%) were associated with B12 deficiency. Focusing on the effects of single MND, folate deficiency was associated with LBW (RR [95% CI]: 1.21 [1.06, 1.39]), and inflammation was associated with SGA (1.15 [1.03, 1.29]). Looking at the effect of co-occurring MNDs, women with folate deficiency, but not iron (1.37 [1.13, 1.67]) or vitamin B12 deficiency (1.66 [1.08, 2.54]), exhibited a higher risk of LBW comparing with those with neither of the deficiencies. Iron deficiency without vitamin B12 deficiency was associated with a lower risk of LBW (0.42 [0.27, 0.67]). No significant differences were observed among women with two MNDs compared to those with neither deficiency.

CONCLUSIONS

Certain maternal characteristics were associated with MNDs and inflammation, potentially contributing to adverse birth outcomes. A better understanding of the unexpected effect of co-occurring MNDs and complex underlying nutrient interactions may be useful to improve birth outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP50_09

Dietary pattern analyses: a comparison of different clustering METHODS

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BACKGROUND AND OBJECTIVES
Understanding dietary patterns and their determinants is necessary to identify leverage points in food systems transformation that can help achieve sustainable healthy diets. Several METHODS exist to analyse dietary patterns, but it remains unclear which method is better at capturing the variation in food consumption among individuals and at clustering consumers with similar dietary patterns in a population. This study compares dietary patterns identified using two METHODS in the same population.
METHODS

Under the CGIAR initiative Sustainable Healthy Diets Through Food System Transformation (SHiFT), dietary intake data were collected using a multi-pass quantitative 24-hour recall in adolescents 11 to 19 years in low- to middle- income areas in small-town, peri-urban, and urban North Vietnam (n=2861). We compared dietary patterns identified using Latent Class Analysis (LCA) with patterns identified using Agglomerative Hierarchical Clustering (AHC). Healthiness of dietary patterns was evaluated as Global Diet Quality Score (GDQS-Healthy and GDQS-Unhealthy components; a higher score reflecting higher diet quality).

RESULTS

Using LCA, we identified five dietary patterns consumed by 26, 24, 20, 15 and 15% of the population. Pattern 5 had lowest consumption of healthy foods (GDQS-Healthy 5 out of 32; GDQS unhealthy 12 out of 17), and mainly consisted of rice and poultry. Pattern 3 had the highest consumption of unhealthy foods, with high intakes of soft drinks and sweets. Pattern 4 had high intakes of both healthy and unhealthy food groups (GDQS-Healthy 11, GDQS-Unhealthy 12), characterized by intakes of fish, eggs, and liquid oil. AHC also identified five patterns, consumed by 41, 30, 14, 8, and 7% of the population. Pattern 3 was the least healthy, both in its low intake of healthy and high intake of unhealthy food groups (GDQS Healthy 7, GDQS Unhealthy 9). Main food groups consumed were soft drinks, deep fried foods, and sweets. Pattern 4 was the healthiest (GDQS-Healthy 8, GDQS-Unhealthy 12), with high intakes of fruits, leafy vegetables, cruciferous vegetables, whole grains, and dairy.

CONCLUSIONS
The dietary patterns identified differed in cluster size, healthiness and food intake. With AHC, one pattern had poor diet quality based on both low intake of healthy foods and high intake of unhealthy foods, whereas with LCA these scores were divided over two distinct patterns. When analysing dietary patterns, RESULTS from data exploration guides method choices. We found comparing METHODS and understanding the consequences of underlying algorithms valuable to check their robustness before drawing CONCLUSIONS.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 02 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP2_01

CURATIVE EFFECT OF ZINC-SELENIUM TEA ON RAT'S CARDIOTOXICITY INDUCED BY LONG-TERM EXPOSURE TO NONYLPHENOL

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BACKGROUND AND OBJECTIVES

This study aimed to explore whether zinc-selenium tea has an curative effect on the cardiotoxicity induced by environmental endocrine disruptors-nonylphenol (NP), and to compare the effect of zinc-selenium tea and green tea.

METHODS

The rats were randomly divided into 4 groups (each group of 10): control group (C, corn oil), NP group (40 mg/kg), NP (40 mg/kg) + green tea group (1 g/kg) /d), NP (40 mg/kg) + zinc-selenium tea group (1g/kg/d). Rats were gavaged on an empty stomach once a day at 8:00, with a volume of 5ml/kg. All dose groups were gavaged with corn oil or drugs for 180 days.

RESULTS

After drinking of zinc-selenium tea or green tea, compared with the control group, the left ventricular anterior wall became thinner, and the left ventricular end-diastolic diameter increased, the anterior wall of the left ventricle became thin at the end of diastole in the NP group. The serum myocardial enzymes aspartate aminotransferase (AST), serum creatine kinase (CK), serum creatine kinase isoenzyme (CK-MB), lactate dehydrogenase (LDH) and α-hydroxybutyrate dehydrogenase (α-HBDH) in the NP group were significantly increased, and the serum myocardial enzymes were significantly decreased after the intervention of zinc-selenium tea. Proteins and mRNA expressions of CollagenI and Colagen III in the tea groups were lower than those in the NP group. In the green tea and zinc-selenium tea intervention groups, the disorder and degree of myocardial fiber were alleviated to varying degrees. The disturbance, breakage and inflammatory cell infiltration of myocardial fibers in zinc-selenium tea and green tea groups were less than that of NP group. After tea intervention, collagen I and collagenIII in the myocardium decreased. The intervention effect of zinc-selenium tea was better than that of green tea.

CONCLUSIONS

Zinc-selenium tea and green tea could interfere with the cardiotoxicity indued by NP, which would alleviate the myocardial fibrosis by reducing expressions of collagen I and collagen III. Moreover, the curative effect of zinc-selenium tea was better than that of green tea.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP2_02

ASSOCIATIONS OF CIRCADIAN BEHAVIOUR INDEX WITH PLASMA GLYCEMIC PARAMETERS AND CONTINUOUS GLUCOSE MONITORING MEASURES AMONG PREGNANT WOMEN

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BACKGROUND AND OBJECTIVES

Disruptions in the alignment of food intake, exercise, sleep, and light exposure timing with the endogenous circadian clock are associated with metabolic disturbances[1]. This study examined the combined effects of these factors on glycemic regulation during pregnancy.

METHODS

In this prospective cohort study, 279 healthy pregnant women at 18-24 weeks' gestation completed 4-day food diaries and questionnaires assessing sleep, exercise, and media use. Glycemic outcomes included fasting, 1-hour and 2-hour plasma glucose levels, gestational diabetes mellitus (GDM) diagnosis via a 75-g oral glucose tolerance test at 24–28 weeks, and continuous glucose monitoring (CGM) metrics at 18–24 weeks. Skewed outcomes were log-transformed. The Circadian Behaviour Index (CBI) quantified temporal behaviour disruptions by assigning one point each for the following: night-eating (>50% of total daily energy intake after 7 P.M.)[2], eating jetlag (>1-hour difference in weekday-weekend first or last meal time)[3], short or excessive sleep (<7 or >9 hours)[4], social jetlag (>2-hour difference in weekday-weekend sleep midpoint)[5], excessive electronic media use before bedtime after 7 P.M. (≥ 3 hours)[6] and physical activity after 7 P.M. (≥10 minutes of any type of activities)[7]. Higher CBI scores (range: 0-6) indicated greater temporal behaviour disruptions. Multivariable linear and logistic regressions, respectively, assessed associations between CBI and continuous and binary glycemic outcomes.

RESULTS

The mean [standard deviation (SD)] CBI score was 1.82 (1.11), with 10% of participants scoring >3. After adjusting for covariates, each one-point increase in the CBI was associated with higher fasting glucose (FG) [geometric mean ratio (95% confidence intervals): 1.02 (1.01, 1.03)], 1-hour glucose [1.03 (1.00, 1.06)], and CGM metrics, including mean glucose (MG) [1.02 (1.00, 1.04)], glucose management indicator (GMI) [1.01(1.00, 1.03)], J-index [1.05 (1.01, 1.09)], and SD [1.04 (1.01, 1.08)]. No significant association was observed for GDM. When comparing extreme categories, women with CBI score >3 (vs. <1) had higher FG [1.06 (1.01, 1.11)], 1-h glucose [1.13 (1.01, 1.27)], MG [1.10 (1.01, 1.19)], GMI [1.06 (1.01, 1.12)], J-index [1.27 (1.05, 1.53)], %time>7.8 mmol/L [1.64 (1.07, 2.53)], and SD [1.26 (1.03, 1.54)].

CONCLUSIONS

Higher CBI scores were associated with a poorer glycemic profile during pregnancy, suggesting the importance of addressing rhythm-disruptive behaviours to optimize maternal glucose control.

CONFLICTS OF INTERESTS

FY received reimbursement for speaking at conferences sponsored by companies selling nutritional products.

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OAP2_03

EVALUATION AND COMPARISON OF THE AVAILABILITY AND HEALTHINESS OF BREADS, YOGURTS AND BREAKFAST CEREALS ACCORDING TO THEIR DEGREE OF PROCESSING IN THE USA AND FRANCE

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BACKGROUND AND OBJECTIVES

The increase in the consumption of ultraprocessed foods (UPFs) over recent decades has become a growing public health concern (Baker et al., 2020). Foods such as oats, natural yogurts, and simple breads have long histories of consumption across various culinary traditions, however, technological advancements have enabled the development of ultra-processed versions. The availability of less processed foods varies significantly across countries with differing cultural and regulatory contexts, such as France and the United States (US).This study aims to evaluate and compare the availability and the nutritional quality of ultra-processed breads, yogurts, and breakfast cereals with their less-processed versions in the US and French markets.

METHODS

Cross-sectional study using the Open Food Facts platform as a data source to obtain the list of food products. Data on breads, yogurts, and breakfast cereals registered on the Open Food Facts platform for United States and France through July 2024 were extracted. Eligible products had a unique code and available information on Nova classification, Nutri-Score score, nutritional composition and food additives. Data were expressed as absolute or relative frequencies for categorical variables, and continuous variables were presented as median and interquartile range (IQR).

RESULTS

The final sample included 28,490 products: 14,662 from the USA and 13,828 from France. Among them, 5,365 were breakfast cereals, 9,831 were yogurts, and 13,294 were breads. Most breakfast cereals and yogurts belonged to group 4, but less processed options were also present in both countries. For breads, group 4 dominated, though group 3 had significant representation, especially in France. Nutritional quality varied by Nova group. Over 90% of group 1 cereals received high Nutri-Score ratings (A or B), while over 70% of group 4 cereals fell into lower categories (C, D, E). Group 1 yogurts had high scores in both countries (92.3% USA, 70.5% France). Breads showed diversity: 62.1% of group 3 scored A or B in the USA versus 47.5% in France, while 59% of group 4 breads were A or B in both countries.

CONCLUSIONS

Based on the 28,490 products assessed, a significant proportion of these were found to be UPFs, especially in the USA. However, less processed alternatives were also present in both countries, particularly in France. These RESULTS highlight the importance of promoting less processed options to improve the nutritional quality of the diet.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP2_04

IMPACT OF SERUM FOLATE CONCENTRATIONS DURING PREGNANCY ON OFFSPRING FOLATE STATUS: A PROSPECTIVE LONGITUDINAL STUDY

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BACKGROUND AND OBJECTIVES

Folic acid supplementation (FAS) before conception and throughout pregnancy is widely used in prenatal care to prevent neural tube defects and gestational anemia. However, there is limited longitudinal data on maternal folate levels during pregnancy, and emerging evidence suggests that excessive folate during pregnancy may influence long-term health outcomes for both mothers (1) and offspring (2,3). This study examines the serum folate levels in pregnant women and their children in a cohort with mandatory folic acid flour fortification and FAS distribution through prenatal care.

METHODS

We enrolled pregnant women (mean age 24.7 years) and collected data on lifestyle factors, including FAS use (5 mg/day), and serum folate concentrations during the second and third trimesters, as well as at 1- and 2-year follow-ups for their offspring. Folate levels were measured using high-performance liquid chromatography. Folate deficiency was defined as serum folate < 4.4 ng/mL(4), and high folate concentrations as serum folate ≥ 21 ng/mL

RESULTS

Among the 497 women with available data, 372 (74.8%) reported FAS use, while 90 (15.3%) did not provide this information. Median (interquartile ranges, IQR) serum folate concentrations were higher among FAS users during the second (12.8 ng/mL, IQR 9.3-18.8) and third (10.1 ng/mL, IQR 7.3-14.2) trimesters compared to non-users (10.1 ng/mL, IQR 7.4-15.1; 8.6 ng/mL, IQR 6.1-12.9). FAS use was not associated with gestational morbidities, maternal anemia at delivery, or newborn birth weight. At the 1-year (n=225) and 2-year (n=211) follow-ups, only 2 and 1 children exhibited folate deficiency, while 23 (10%) and 40 (19%) children had high serum folate concentrations, respectively.

CONCLUSIONS

Mandatory folic acid fortification and supplementation significantly increase serum folate levels in both pregnant women and their children. However, the potential long-term effects of high folate concentrations on child health warrant further monitoring in longitudinal studies. These findings will help guide future recommendations for folic acid supplementation during pregnancy to optimize health benefits while minimizing risks of excessive folate exposure.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP2_05

EFFECTS OF A HYPOCALORIC TIME-RESTRICTED FEEDING DIET PROGRAM ON SLEEP QUALITY, QUALITY OF LIFE, AND PERCEIVED STRESS IN INDIVIDUALS WITH METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE: A SECONDARY ANALYSIS OF A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Time-restricted feeding (TRF) seems to have favorable effects on cardiometabolic risk factors in individuals with metabolic dysfunction-associated steatotic liver disease (MASLD); however, its effects on lifestyle parameters have not been studied yet in this population. This study aimed to investigate the impact of a hypocaloric TRF diet program on sleep quality, quality of life, and perceived stress in MASLD patients.

METHODS

This is a secondary analysis of a 12-week randomized controlled trial in MASLD individuals with overweight/obesity consisted of three groups, all following a hypocaloric Mediterranean-type diet: control (without any time restriction in feeding), early 14:10 (14 hours of fasting) TRF (eTRF, eating between 08:00-18:00), and late 14:10 TRF (lTRF, eating between 12:00-22:00). All participants filled out the Pittsburgh Sleep Quality Index (PSQI), the Chronic Liver Disease Questionnaire (CLDQ), and the 14-item Perceived Stress Scale (PSS) at baseline and 12 weeks.

RESULTS

Fifty-nine MASLD individuals (27 males, 45.8%; mean age 52.9 years; BMI 32.1 kg/m2) participated in the analysis (control, *n*=19; eTRF, *n*=20; lTRF, *n*=20). All groups achieved significant 12-week improvements in body weight and liver steatosis, but only the eTRF group improved glucose metabolism. The 3 groups did not differ in PSQI, CLDQ, and PSS scores at 12 weeks. The C improved the total CLDQ score and the sub-scores of abdominal symptoms, fatigue, and worry. The eTRF improved the total CLDQ score and the sub-scores of systemic symptoms and worry. The lTRF improved the score of systemic symptoms of the CLDQ; however, in this group, the PSQI score, also, improved at 12 weeks. Finally, in the lTRF, there was a positive correlation between the 0-12 weeks difference in 0-60 min area under the curve for glucose and the differences in sleep quality and PSS score. The lTRF had a higher difference of 0.302 units in sleep quality compared to the control.

CONCLUSIONS

A Mediterranean-type diet may lead to improvements in the quality of life in MASLD patients, with or without time restrictions in feeding. However, a later TRF protocol seems to have favorable effects on sleep quality.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP2_06

EFFECT OF INTEGRATING HOUSEHOLD WATER TREATMENT AND HYGIENE PROMOTION INTO THE NATIONAL PROTOCOL FOR MANAGEMENT OF ACUTE MALNUTRITION OF SENEGAL – A CLUSTER-RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Severe acute malnutrition (SAM) affects approximately 17 million children globally, increasing their susceptibility to disease and risk of mortality. The WHO recommends that uncomplicated SAM cases receive outpatient treatment under the Community-based Management of Acute Malnutrition (CMAM) approach. CMAM has reduced cost of treatment, increased coverage and improved outcomes, but recovery rates vary significantly across settings.

METHODS

The TISA study was a cluster-randomised trial to assess the effectiveness of combining a scalable water, sanitation and hygiene (WASH) kit within the standard CMAM protocol for uncomplicated SAM cases aged 6-59 months, in northern Senegal. 86 health centres were randomly allocated to a control group receiving the national CMAM protocol or to an intervention group receiving a "WASH kit" in addition to the standard protocol. The WASH kit included a plastic storage vessel for drinking water, a supply of chlorine tablets, soap, and instruction on water treatment and hygiene practices. Outcomes included SAM recovery, weight gain, referral to inpatient care, diarrhoea, and all-cause mortality.

RESULTS

2411 children diagnosed with uncomplicated SAM were enrolled. The proportion of children recovering from SAM was similar in the control (39.3%) and intervention groups (39.7%) and we found no evidence for a difference between arms (aOR 0.98, 95% CIs 0.66 – 1.45). Nurse-recorded recovery was higher in the intervention arm (60.0%) than the control arm (54.1%) but with no evidence for a difference (aOR: 1.08; 95%CIs: 0.72-1.64). Weight gain was greater in the intervention arm (4.38 g/kg/d) than the control arm (4.06 grams per kg per day [g/kg/d]) with no evidence of a difference between arms (difference in means 0.24; 95%CIs: -0.40 - 0.88). There was no evidence for a difference in mortality between arms. Caregiver-reported diarrhoea at 8-weeks follow-up was higher in in the control group (20.0%) than the intervention group (12.5%), with evidence for a difference between arms, accounting for between-group differences at baseline (aOR: 0.36; 95%CIs: 0.26 – 0.50).

CONCLUSIONS

The addition of a WASH kit and hygiene promotion to the CMAM protocol did not improve recovery nor related outcomes of weight gain and referral. The intervention did though reduce diarrhoea progressively at 4 and 8 weeks of follow-up. Our RESULTS suggest that the addition of a WASH kit to the standard protocol would not improve SAM outcomes in this setting but would potentially reduce the burden of diarrhoea among this vulnerable group.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP2_07

ASSOCIATION BETWEEN SEDENTARY BEHAVIOURS AND ADHERENCE TO THE MEDITERRANEAN DIET IN PRESCHOOL CHILDREN: CORAL STUDY

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BACKGROUND AND OBJECTIVES

Sedentary behaviours, such as excessive screen time, are associated with negative health outcomes in children. Adherence to the Mediterranean Diet (MD) is recognized for its protective role against cardiometabolic risk factors, but its relationship with sedentary behaviours in preschool children remains unclear. This study aimed to evaluate the association between adherence to the MD and sedentary behaviours in preschool children.

METHODS

This study included 1,414 preschool children from the CORALS cohort, a multicenter prospective study conducted in seven Spanish cities. Sedentary behaviour was defined as exceeding 60 minutes of daily screen time. It was assessed based on time spent watching television and using mobile devices or tablets, as reported by parents through a questionnaire. This threshold was established according to the World Health Organization (WHO) recommendations for preschool children, which advise less than one hour per day. Adherence to the MD was assessed using the MED4CHILD questionnaire, recently validated for preschool-aged children, with higher scores indicating greater adherence. Logistic regression models were used to evaluate the association between MD adherence score and sedentary behaviour, adjusting for age and maternal education. Separate analyses were conducted for boys and girls. All the statistical analyses were carried out using the SPSS statistical package (version 25.0, SPSS Inc., Chicago, IL, USA).

RESULTS

Higher adherence to the MD was associated with a reduced likelihood of sedentary behaviour in both boys and girls. Among boys, a one-unit increase in the MED4CHILD score was associated with an 18.3% reduction in the odds of being sedentary (OR = 0.827; 95% CI: 0.773–0.884; $p < 0.001$). Among girls, the reduction was 15.3% (OR = 0.847; 95% CI: 0.794–0.899; $p < 0.001$). Age was positively associated with sedentary behaviour in both groups, with older children exhibiting higher odds of being sedentary (boys: OR = 1.528; 95% CI: 1.291–1.808; girls: OR = 1.616; 95% CI: 1.375–1.899; $p < 0.001$). Maternal education was significantly associated with sedentary behaviour. Boys and girls with mothers having medium or high education exhibited higher odds of being sedentary compared to those with mothers having low education, with ORs ranging from 1.95 to 2.53 ($p < 0.001$).

CONCLUSIONS

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Adherence to the MD is inversely associated with sedentary behaviours in preschool children, with similar effects observed in boys and girls. These findings highlight the importance of promoting healthy dietary patterns and limiting screen time from an early age.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP2_08

EFFECTS OF EGG AS AN EARLY COMPLEMENTARY FOOD ON GROWTH AND DEVELOPMENT, MORBIDITY, ALLERGY AND NUTRITIONAL STATUS BIOMARKERS OF 6 TO 9-MONTH-OLD INFANTS: A RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Effects of egg as an early complementary food on growth and development, morbidity, allergy and nutritional status biomarkers of 6 to 9-month-old infants: A randomised controlled trial

METHODS

In a randomised controlled trial, we investigated the effects of daily egg provision (n=250) compared to no egg provision (n=250) among infants aged 6 to 9 months from a low socioeconomic community for 6 months during 2021 on linear growth and other growth parameters, gross motor milestones development, anaemia and iron status, incidence and duration of morbidity including COVID-19, allergic sensitisation and symptoms to eggs and other common allergenic foods.

RESULTS

Baseline prevalence of stunting, underweight, wasting, overweight and anaemia was 23.8%, 9.8%, 1.2%, 13.8%, and 29.2%, respectively, and did not differ between groups. There was no intervention effect on length-for-age, weight-for-age, weight-for length Z-scores, gross motor milestone development, anaemia, iron status or COVID-19 infection. There was a significant reduction in fibroblast growth factor 21 (FGF21) concentration in the intervention group (B=−0.132; 95% CI −0.255, −0.010; p=0.035). Baseline levels of fibroblast growth factor 21 (FGF21) and intestinal fatty acid-binding protein (I-FABP) were inversely associated with endpoint growth indicators. Gastrointestinal morbidity without fever tended to be 1.4 times higher in the intervention group (OR: 1.43, 95% CI: 1.03, 1.93; P=0.058) and 4 times higher with fever (OR: 4.07, 95% CI: 0.86, 19.23; P=0.077). At endpoint, egg sensitisation was observed in 1.9% of the egg intervention group and 2.0% of the control group (adjusted odds ratio [aOR]: 0.936; 95% CI: 0.229–3.822; p=0.926). Sensitisation to all foods occurred in 7.5% of the egg intervention group and 12.9% of the control group (aOR: 0.515; 95% CI: 0.264–1.005; p=0.052). The incidence of allergic disease during the study was 7.5% in the egg intervention group compared to 13.4% in the control group (p=0.069).

CONCLUSIONS

Complementary feeding with eggs did not improve linear growth and may increase gastrointestinal morbidity. However, the egg intervention reduced growth hormone resistance and decreased allergic sensitisation to common allergenic foods, suggesting it could be a promising approach if implemented carefully, accompanied by ongoing caregiver training on hygiene practices. It may also contribute to enhancing dietary diversity in these populations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 03 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP3_01

ASSOCIATION OF CORD BLOOD VITAMIN D AND VDR/VDBP GENETIC POLYMORPHISMS WITH CHILDHOOD ALLERGY IN SHANGHAI, CHINA: A PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES

The influence of early-life vitamin D on the development of childhood allergies remains a subject of debate. Polymorphisms in genes associated with the vitamin D pathway, specifically the VDR and VDBP genes, are hypothesized to modulate the effects of vitamin D in vivo. In our prior study, we observed that the concentration of 25-hydroxyvitamin D [25(OH)D] in cord blood was, on average, 9.2 ng/mL lower, representing an approximate 50% reduction compared to maternal levels. This study aims to investigate the associations between vitamin D exposure and genetic interactions pertaining to the VDR/ VDBP genes in the context of childhood allergy development.

METHODS

In a population-based cohort study comprising 826 participants, we examined the relationship between cord blood serum levels of 25(OH)D and the incidence of allergies at 6 months, 1 year, and 2 years of age. The concentrations of 25(OH)D were quantified using liquid chromatography-tandem mass spectrometry. The analyses were stratified according to genotypes of the vitamin D receptor (VDR) genes [rs1544410 (BsmI), rs731236 (TaqI), rs7975232 (ApaI)] and the vitamin D binding protein (VDBP) genes (rs4588 and rs7041).

RESULTS

A U-shaped relationship was observed between cord blood serum25(OH)D levels and the risk of developing childhood allergies. In infants with 25(OH)D levels below 15 ng/mL, the risk of total allergy status at two years of age increased as 25(OH)D levels decreased (Odds Ratio [OR] 1.50; 95% Confidence Interval [CI]: 0.99-2.34), particularly among those carrying the rs4588 CC genotype (OR 5.00; 95% CI: 1.20-20.83). Conversely, in infants with 25(OH)D levels exceeding 25 ng/mL, the risk of allergy increased with higher 25(OH)D levels (OR 1.78; 95% CI: 1.19-2.67), notably among those with the rs4588 AA genotype and the rs7041 TT genotype.

CONCLUSIONS

Both deficient and excessive vitamin D status during early life are associated with an increased risk of childhood allergies. Polymorphisms that influence vitamin D-binding protein (VDBP) levels modify the relationship between serum 25(OH)D concentrations and childhood allergy, suggesting enhanced vitamin D bioavailability in individuals with lower VDBP levels. This finding supports the biological plausibility of vitamin D's involvement in the pathogenesis of allergies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP3_02

NUTRITIONAL STATUS IS ASSOCIATED WITH COGNITION AND GRIP STRENGTH AMONG OLDER ADULTS: A 10 YEAR LONGITUDINAL STUDY IN GHANA AND SOUTH AFRICA

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BACKGROUND AND OBJECTIVES

A large body of works exists on the associations between nutritional status, cognition and grip strength globally. However, there is limited understanding of the nature of these associations among older African populations. The current study examines the association between nutritional status – and changes in cognition and grip strength among Ghanaian and South African older adults over time by using three waves of data from the WHO Study on global AGEing and adult health (SAGE).

METHODS

In total 6,242 and 3,623 adults aged 60+years were assessed from Ghanaian and South African datasets, respectively, extracted from the three waves of the SAGE study, conducted between 2007 and 2019. The 6-item Mini Nutritional Assessment – Short Form questionnaire – was used to evaluate nutritional status. The five cognitive performance tests comprising immediate and delayed verbal recall, forward and backward digit span and verbal fluency were used to compute cognitive status. Handgrip strength was evaluated by dynamometer performed twice for each hand. The baseline covariates included age, gender, marital status, education, location of residence, living conditions, alcohol use, tobacco use, dietary habits, physical activity, gait speed and chronic health conditions. Data were analyzed by one-way ANOVA and linear mixed models.

RESULTS

After adjusting for all significant covariates, participants at risk of malnutrition (Ghana 3.08 (SE=0.54), $p<0.0001$; South Africa 3.94 (SE=1.54), $p<0.0001$) and those with adequate nutritional status (Ghana 6.42 (SE=0.57), $p<0.0001$; South Africa 8.45 (SE=1.52), $p<0.0001$) had significantly higher cognitive scores compared to malnourished participants. In Ghana, significantly higher handgrip strength was measured in participants either classified as at-risk of malnutrition (1.46 (SE=0.47), $p=0.002$) or with adequate nutritional status (2.16 (SE=0.52), $p<0.0001$), compared to participants classified as malnourished. In South Africa, only those with adequate nutritional status had a higher handgrip strength (9.76 (SE=1.97), $p<0.0001$).

CONCLUSIONS

The study has confirmed a positive longitudinal association between nutritional status and both cognitive function and hand grip strength for older adults in Ghana and South Africa. These findings highlight the importance of nutritional interventions to promote access to adequate, nutritious diets as people in low and middle income countries age.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP3_03

ASSOCIATION BETWEEN GUT MICROBIOTA DURING PREGNANCY AND THE DEVELOPMENT OF GESTATIONAL DIABETES MELLITUS

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BACKGROUND AND OBJECTIVES

Gut microbiota plays an important role in regulating physiological functions of the host. However, the longitudinal association between the gut microbiome during pregnancy and gestational diabetes mellitus (GDM) remains unclear.

METHODS

Pregnant women who registered between 12 and 14 gestational weeks at a hospital in China between February 2022 and October 2023 were included. Stool samples were collected in each trimester and analyzed for 16s rRNA sequencing. Serum glucose, HbA1c, insulin were retrieved from the records in the Medica Birth Registry. GDM was defined by plasma glucose and OGTT test at 24-28 weeks of gestation using criteria recommended by the International Association of Diabetes and Pregnancy Study Groups. We used MaAsLin2 and linear mixed models to investigate the longitudinal association between gut microbiota abundance and host phenotypes, and employed generalized linear models to examine the role of gut microbiome changes during pregnancy on concurrent host phenotypes changes.

RESULTS

This study included 652 singleton pregnant women with an average age of 32.0 years, and the prevalence of GDM was 21.3%. Pregnant woman with GDM experienced a gradually reduction in microbiome diversity during pregnancy. After adjustment for maternal age, pre-pregnancy BMI and parity, an increase in abundance of *Nitrospirota*, *Nitrospiria*, *Nitrospira*, *Methylomirabilia*, and *Rokubacteriales* were associated with decreased HbA1c levels in mid-pregnancy (all $p<0.05$). Increased relative abundance of *Oscillospirales*, *Ruminococcaceae* and *Faecalibacterium* from early to mid-pregnancy was found to associate with decreased blood glucose levels at 1h of the OGTT in mid-pregnancy ($p<0.05$).

CONCLUSIONS

This study found that the microbial structure and transition during pregnancy was associated with glucose metabolism, which could provide a new strategy for early prevention of GDM.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP3_04

ZINC ABSORPTION FROM MAIZE-BASED MEALS ENRICHED WITH EDIBLE HOUSE CRICKETS: A RANDOMIZED CROSSOVER STABLE-ISOTOPE STUDY IN KENYAN PRE-SCHOOL CHILDREN

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BACKGROUND AND OBJECTIVES

Edible insects have been proposed as a novel and sustainable source of protein and other essential nutrients for human consumption but nutrient absorption efficiency is still uncertain. We investigated zinc absorption from house crickets (*Acheta domesticus*) in a single-center and single-blinded cross-over study with children aged 24-36 months old in Kenya from September-November 2021.

METHODS

Children were randomized to consume two different experimental meals labeled with stable isotopes of zinc (Zn) at two different days, separated by a wash-out period of one month. Primary endpoints were the differences in amount of absorbed zinc (AZ) from maize-based meals enriched with intrinsically 67Zn-labeled house crickets (2.61 mg Zn, n= 28) in comparison with meals enriched with 68Zn (low-enriched: 0.90 mg Zn, n= 29) ; high-enriched: 3.24 mg Zn, n= 28) or with intrinsically 67Zn-labeled low-chitin cricket flour (2.51 mg Zn, n= 25), whereas the secondary endpoints were the differences in fractional zinc absorption.

RESULTS

We found that AZ from meals with whole crickets (geometric mean: 0.36 mg; 95%CI: 0.30, 0.43) was 2.6 times higher than from low-enriched maize meals (0.14 mg; 0.11, 0.16; $P<0.001$), while it was not different from low-chitin cricket flour meals. Absorbed zinc from both cricket meals was higher than that from high-enriched meals. No severe adverse side events were reported.

CONCLUSIONS

We conclude that edible house crickets are a good source of well-absorbable zinc, and their increased consumption could contribute to the alleviation of zinc deficiency. This trial was registered at the Pan African Clinical Trials Registry as PACTR202104533831364.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP3_05

EFFECTS OF FRONT-OF-PACKAGE LABELS FOR ADDED SUGARS AND NON-SUGAR SWEETENERS (NSS) ON PARENTS' PERCEPTIONS AND SELECTION OF FOODS AND BEVERAGES FOR THEIR CHILDREN

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BACKGROUND AND OBJECTIVES

Many countries have adopted FOPLs for added sugars, potentially increasing the use and selection of NSS-containing products. The U.S. Food and Drug Administration is considering FOPLs for added sugars but has yet to address NSS. This study aimed to evaluate effects of FOPLs for added sugars and NSS on U.S. parents' selection of foods and beverages for their children and their perceptions of products' healthfulness for children.

METHODS

Parents (n= 2,896) of children 2-12 years old from across the U.S. completed an online survey and were randomized to one of three treatment arms: control (n = 990), FOPL for added sugars (n = 949), or FOPLs for both added sugars and NSS (n = 957). Participants were shown four fruit drinks and four yogurts. For each set, one was unsweetened, one was sweetened with added sugars only, one with NSS only, and one with added sugars and NSS. Products in each set were shown in random order and had FOPLs per the participants' assigned treatment arm. Participants selected which product they would buy and which they considered the healthiest. Group differences were analyzed using proportions with 95% confidence intervals (CIs) for each treatment arm.

RESULTS

Participants exposed to both added sugar and NSS FOPLs were significantly more likely to choose the unsweetened fruit drink (58%, CI: 55–61) compared to the added sugar FOPL group (40%, CI: 36–43) and the control group (32%, CI: 29–35). For yogurt, 60% (CI: 57–64) of participants in the added sugar and NSS FOPL condition selected the unsweetened option, compared to 29% (CI: 26–32) in the added sugar FOPL group and 14% (CI: 12–17) in the control group. Additionally, participants in the added sugar and NSS FOPL condition were most likely to identify unsweetened products as the healthiest for fruit drinks (70%, CI: 67–73), compared to the added sugar FOPL group (46%, CI: 42–49) and the control group (37%, CI: 34–40). Similarly, for yogurts, participants in the added sugar and NSS FOPL condition identified the unsweetened option as the healthiest (76%, CI: 73–79), compared to the added sugar FOPL group (49%, CI: 46–52) and the control group (33%, CI: 30–36).

CONCLUSIONS

FOPLs for both added sugars and NSS resulted in a higher likelihood of identifying unsweetened products as the healthiest option and choosing them for their children, compared with either a FOPL for only added sugar or no FOPL. These findings are particularly relevant for countries adopting FOPLs, as they demonstrate that labeling both added sugars and NSS can encourage parents to choose healthier, unsweetened options for their children.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP3_06

ADHERENCE TO FRENCH DIETARY GUIDELINES AND HYPERTENSION: INTERACTIONS WITH OTHER LIFESTYLE FACTORS IN THE E3N FRENCH PROSPECTIVE COHORT

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BACKGROUND AND OBJECTIVES

Diet is a modifiable risk factor of hypertension, such as other lifestyle factors (BMI, physical activity, or smoking). French dietary guidelines offer advice for a healthier diet. We aimed to study the association between adherence to these dietary guidelines and hypertension in the E3N (Etude Epidémiologique auprès de femmes de l'Education Nationale) French cohort, and to analyse interactions between adherence to these guidelines and other lifestyle factors.

METHODS

We studied 45 251 women of the E3N prospective cohort who completed a questionnaire on food consumption, BMI, physical activity, and smoking status in 1993. Adherence to French dietary guidelines was estimated using the simplified "Programme National Nutrition Santé - guidelines score 2" (sPNNS-GS2). We estimated the association between sPNNS-GS2 and hypertension using Cox proportional hazard models. We also studied interactions (on both additive and multiplicative scales) between sPNNS-GS2 and BMI, physical activity, and smoking status in relation to hypertension risk.

RESULTS

During follow-up (1993-2014), we identified 13 623 hypertension cases. We found a linear inverse association between sPNNS-GS2 and hypertension (HRoneSD [95%CI]: 0.92 [0.89; 0.95]). We observed a statistically significant multiplicative interaction between sPNNS-GS2 and BMI (pinteraction=0.026), and no statistically significant multiplicative interaction with physical activity and smoking status. We didn't observe statistically significant additive interactions with BMI, physical activity, and smoking status. When studying the combined variable of sPNNS-GS2 and BMI (both in two categories split along their median) in relation to hypertension, a high BMI (irrespective of sPNNS-GS2) was associated with a higher risk of hypertension than a low BMI (even with a low sPNNS-GS2): HRlowBMI/highsPNNS-GS2 as reference, HRlowBMI/lowsPNNS-GS2 [95%CI]: 1.08 [1.02; 1.14], HRhighBMI/highsPNNS-GS2 [95%CI]: 1.41 [1.34; 1.48], and HRhighBMI/lowsPNNS-GS2 [95%CI]: 1.50 [1.43; 1.59]. We also highlighted that a low sPNNS-GS2, compared to a high sPNNS-GS2, was more strongly associated with a higher risk of hypertension among current smokers (HRlowsPNNS-GS2 vs highsPNNS-GS2 [95%CI]: 1.14 [1.04; 1.25]) than among no of former smokers (HRlowsPNNS-GS2 vs highsPNNS-GS2 [95%CI]: 1.07 [1.02; 1.11]).

CONCLUSIONS

This study suggests that higher adherence to French dietary guidelines is associated with a reduced risk of hypertension and discusses the complex interactions between adherence to French dietary guidelines and other lifestyle factors in their relation with hypertension.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP3_07

EXAMINING THE RELATIONSHIP BETWEEN MEDITERRANEAN DIET AND INFERTILITY AMONG US WOMEN: AN INVESTIGATION OF THE US NHANES

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BACKGROUND AND OBJECTIVES

Infertility, the inability to achieve pregnancy after 12 months or more of trying to conceive, affects 20-30% of women of reproductive age (1). Fertility is not only a key indicator of reproductive health but is also independently associated with increased psychological distress, economic strain, marital discord, and later-onset adult diseases. Reproductive outcomes can be influenced by lifestyle factors, including smoking, physical activity, and diet (2). There has been limited investigation which considers the role of dietary patterns on infertility. Previous investigations in the US has implicated the "fertility diet", high in healthy fats, vegetable protein, dairy, iron, and supplements, in lower odds of infertility (3). Similarly, adherence to a Mediterranean Diet (MD), a diet high in whole foods and healthy fats, and low in processed foods, dairy, and refined carbohydrates, was associated with improved fertility among Spanish women (4). This relationship has not yet been investigated in Western contexts. The primary aim of this study was to examine the association between MD adherence and infertility among a nationally representative sample of US women.

METHODS

Our study draws on data from the 2013/14 and 2015/16 National Health and Examination Survey, a nationally representative cross-sectional health survey of Americans. Dietary data collected by 24-hour dietary recall will be scored based on adherence to MD, using a literature-based scoring system. Participants were grouped into quartiles based on MD scores. Multivariable logistic regression analyses assessed the association between MD quartile and self-reported infertility, adjusting for age, race, income, education, smoking, birth control use, female hormone use, age at menarche, history of pelvic inflammatory disease (PID), body mass index (BMI), physical activity (PA), and total energy intake.

RESULTS

We found that infertility affected 13.15% of American women and was significantly associated with being older, married, higher income, history of PID, and less PA. Mean MD score among infertile women was 5.23, significantly lower than fertile women who scored a mean MD score of 5.46. In the fully adjusted model, being in the highest MD quartile compared to the lowest was significantly associated with lower odds of infertility (OR: 0.408; 95%CI: 0.209, 0.798).

CONCLUSIONS

This work highlights key, modifiable lifestyle factors contributing to reproductive health among women, providing important perspectives to inform current food policies as well as improve consumer guidance.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP3_09

ASSOCIATION BETWEEN IRON DEFICIENCY ANEMIA AND GUT MICROBIOME COMPOSITION IN POSTPARTUM, MALNOURISHED LACTATING WOMEN IN PAKISTAN

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BACKGROUND AND OBJECTIVES

Anemia remains the most prevalent nutrition-related disorder among pregnant women in developing countries, significantly affecting maternal and child health. However, postpartum anemia, particularly in low-resource settings, remains underexplored despite its association with impaired quality of life, reduced cognitive function, emotional instability, depression, and other significant health challenges in women of reproductive age. This study investigates the impact of postpartum anemia on the gut microbial ecology of lactating women from a peri-urban setting in Pakistan.

METHODS

Stool samples from 150 lactating women were collected as part of the Mumta Lactating Women (LW) Trial. Microbiome profiling was conducted using shotgun metagenomic sequencing. Bray-Curtis dissimilarity quantified pairwise differences between microbiome samples, while PCoA reduced dimensionality to highlight distinguishing microbial features between healthy and anemic cohorts. Generalized linear models (GLM) identified associations between anemia and microbial taxa and pathways. Random Forest (RF) machine learning was applied to uncover microbiome predictors of postpartum anemia.

RESULTS

Stool samples from 144/150 women (healthy: 36, anemic: 108) passed QC. Shannon diversity analysis showed significantly reduced microbial diversity in anemic mothers ($p = 0.0063$), reflecting taxonomic dysbiosis with decreased richness and evenness. Prevotella copri was the most abundant species across cohorts, with higher relative abundance in healthy mothers. Bray-Curtis dissimilarity and PERMANOVA revealed moderate ecological disruptions in anemic microbiomes (beta-diversity, $p = 0.083$). Escherichia coli and Bifidobacterium longum were key contributors to microbial community structure. Differential analysis identified ~15 species enriched in healthy mothers, including Acetatifactor spp., Olsenella spp., and Parabacteroides distasonis, while these taxa were diminished in anemic mothers. RF modelling highlighted Acetatifactor spp., Prevotella spp., and Olsenella spp. as top predictors of postpartum anemia (AUC = 0.814).

CONCLUSIONS

Postpartum iron deficiency anemia in malnourished LW is associated with microbial dysbiosis, reduced diversity, and compositional shifts in the gut microbiome. Key microbial signatures, including *Acetatifactor spp.*, *Prevotella spp.*, and *Olsenella spp.*, show potential as predictive biomarkers for anemia. These findings underscore the need for microbiome-targeted therapeutic interventions to address anemia in low-resource settings.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 09 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP9_01

THE USE OF FOOD FREQUENCY QUESTIONNAIRE DATA IN SUBSTITUTION MODELLING: QUESTIONABLE VALIDITY OF FINDINGS

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BACKGROUND AND OBJECTIVES

Food Frequency Questionnaires (FFQs) are widely utilized in large-scale cohort studies for their practicality in assessing long-term dietary intake. However, FFQs have notable limitations, including recall bias, imprecise portion size estimation, and systematic errors in nutrient reporting. These issues raise concerns about the validity of FFQ data when used in substitution modelling, a method that estimates the effects of hypothetically replacing one food or nutrient with another. We critically examined the appropriateness of using FFQ data in substitution modelling and aim to highlight the potential statistical challenges and inaccuracies that may arise from this practice.

METHODS

We analyzed the statistical challenges associated with FFQ measurement errors, including violations of parametric assumptions, distortions in dose-response relationships, and inaccuracies in estimating individual dietary intake. A literature search of studies published between January 2018 and September 2023 using the search terms ("food frequency questionnaire" OR "FFQ") AND "substitution". A simulated example was used to demonstrate the impact of these errors on substitution analysis outcomes, specifically examining how FFQ data with moderate correlation to true intake influences the detection of significant associations.

RESULTS

The literature search identified 63 studies. After screening, 51 studies were confirmed to have used FFQ data in substitution modelling, with 35.3% and 52.9% published in Science Citation Index (SCI)-Q1 and Q2 journals, respectively. The validity of the FFQs in most of these studies was generally fair to moderate, with over half focusing on substitution variables that were not properly validated. The simulation revealed that FFQ data, even when moderately correlated with true dietary intake, could fail to identify significant associations in substitution analysis.

CONCLUSIONS

Our finding suggests that using FFQ data in substitution modelling can lead to incorrect CONCLUSIONS, potentially compromising the validity of research outcomes that inform dietary guidelines. It is crucial to interpret the RESULTS of such studies with caution. We recommend a re-evaluation of existing literature that relies on FFQ-based substitution models and suggest that future research prioritize quantifying the extent of errors associated with FFQ data to improve the reliability of nutritional research.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP9_02

DOES BODY COMPOSITION IMPACT ESTIMATION OF RESTING METABOLIC RATE IN OLDER ADULTS?

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BACKGROUND AND OBJECTIVES

As body composition changes during ageing, the inclusion of body composition measures as a variable within predictive equations for resting metabolic rate (RMR) may improve predictive accuracy. This analysis aimed to develop new RMR equations for adults (≥65 years) incorporating variables for body composition, to predict performance and accuracy of these equations.

METHODS

Using an international dataset (n=1238), including WHI and CLEVER studies, RMR was predicted from potential predictive variables using stepwise multiple regression. Predictive performance of the final model was assessed using double cross validation and compared with published equations from similar populations. Direct associations between the determined predictor variables and RMR with indirect effects mediated via fat free mass (FFM) was examined using mediation (or pathway) analysis.

RESULTS

The new equations performed similarly to some published anthropometric-based prediction equations. Predictors using FFM performed marginally better than those using lean body weight (LBW). All variables had significant direct effects upon RMR and significant indirect effects for sex, weight and height ($p<0.001$).

RMR = 8.645 * Height (cm) + 23.684 * Weight (kg) - 29.717 * Age (y) + 38.213 * FFM (kg) + 209.637 * Sex (M=1, F=0) + 2693.223

RMR = -30.570 * Age (y) + 80.736 * LBW (kg) - 186.825 * Sex (M=1, F=0) + 3956.822

CONCLUSIONS

Both equations predict RMR at the population level with minimal bias, however the difference in performance with anthropometry-based equations was minimal. This may be explained by the contribution of FFM to weight, whereby equations that include weight already account for FFM.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP9_03

METABOLIC DYSFUNCTION IN INDIAN ADOLESCENTS AND ITS ASSOCIATION WITH BODY FAT AND HEPATIC ADIPOSITY

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BACKGROUND AND OBJECTIVES

India has a high burden of metabolic disease in adulthood, attributed to a higher body fat percentage for a given BMI compared to the Western populations, and also to increased liver fat. While a high number (about 50%) of Indian children aged 5-19 years have recently been shown to have ≥1 biomarker (high plasma glucose, cholesterol, triglycerides and high blood pressure) of chronic disease risk at all BMI ranges, possibly due to increased body fat, it is unclear if there is simultaneous hepatic adiposity at young age as well. This study aimed to determine whether Indian adolescents develop increased liver and body fat simultaneously with biomarkers of metabolic dysfunction.

METHODS

Detailed anthropometry was performed in otherwise healthy adolescents along with the measurement of seated blood pressure. Measurements of metabolic dysfunction (fasting glucose, lipid profile and liver function tests) were made in a fasting blood sample. Hepatic fat was measured by MRI proton density fat fraction (PDFF) using a 3.0 T system (GE Signa Architect) and a 3D volumetric, <16sec breath hold sequence as well as by Ultrasound Guided Attenuated Parameter (UGAP) using LOGIQ E10 ultrasound system (GE Healthcare). Body fat was measured by DXA.

RESULTS

Forty adolescents (26 boys, 14 girls) were recruited with a mean age of 14.3 ± 1.5 years. 25% were overweight with a BMI-for-age >90th percentile. At least one biomarker of metabolic dysfunction was seen in 55% of the children; 10% had a waist-to-height ratio of >0.5, while 22.5 % had an HDL ≤ 40 mg/dl, 12.5% a TG ≥ 130 mg/dl and 17.5% had impaired fasting glucose. All children were normotensive with a BP < 130/80 mmHg. Their average body fat percentage was 22.7 ± 3.1 % (Range 19.2 – 29.0%), while the prevalence of fatty liver, as detected by MRI-PDFF and UGAP imaging, was 5%. The latter was present in the participants without an increase in blood biomarkers of metabolic dysfunction. There was no relation between BMI, percent body fat or liver fat.

CONCLUSIONS

While there is a high prevalence of metabolic dysfunction in Indian adolescents, as found in an earlier national Indian survey, this is not explained by total body or hepatic adiposity. Conversely, high liver or body fat is not accompanied with biomarkers of metabolic risk. Unlike in adults, anthropometric measures and metabolic biomarkers show no clear linkage at this age.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP9_04

SIMULATION OF THE IMPACT OF FERMENTATION DURING INJERA PREPARATION ON ESTIMATION OF FOLATE AND COBALAMIN ADEQUACY IN THE ETHIOPIAN CONTEXT AND ITS CONSEQUENCES

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BACKGROUND AND OBJECTIVES

B-vitamin content of plant-based foods can be deeply modified by fermentation, especially for active cobalamin form. In many food composition tables, cobalamin values are likely to be considered zero by default, even in fermented products of plant origin, which may lead to overestimating the prevalence of inadequate intakes in contexts where fermented products are consumed as staple foods. Injera is a fermented flatbread widely consumed in Ethiopia, and the production of the active form of cobalamin through fermentation have been demonstrated at laboratory scale. The aim of this study was to measure the difference between estimates of folate and cobalamin intake adequacy depending on whether or not the impact of fermentation during injera preparation is considered.

METHODS

This was done using secondary quantitative 24-hour recall data from a survey on 164 non-pregnant and 159 pregnant women in Ethiopia and measures of folate and cobalamin content from the literature (1-3). The usual intake distribution of folate and cobalamin was estimated using the multiple source method and the EAR-cut-point method was used to estimate the prevalence of inadequate intakes of folate and cobalamin among the participants.

RESULTS

The observed dietary pattern was characterized by a plant-based diet, and the average consumption of injera was 170 g/d among the total sample and 442 g/d among the consumers only (38% of the total sample). The observed diet was associated with high prevalence of inadequacy in pregnant and non-pregnant women for folate (99.4% and 86.6%, respectively) and cobalamin (97.5% and 98.8%, respectively). In our simulations, we showed that increasing folate concentrations can reduce inadequacy estimates to 67% in non-pregnant women but not in pregnant women, while increasing cobalamin concentrations can reduce inadequacy estimates to 64% in non-pregnant women and 54% in pregnant women.

CONCLUSIONS

Considering the impact of fermentation during injera preparation had major consequences on estimates of folate and cobalamin adequacy in the Ethiopian context, which should be extended to other contexts where fermented foods are consumed as staple foods.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP9_05

ASSESSING THE LEVELS OF NUTRIENT OF CONCERN IN COMMERCIALLY PRODUCED COMPLEMENTARY FOOD FOR INFANTS AND YOUNG CHILDREN ACROSS SIX WEST AFRICAN COUNTRIES

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BACKGROUND AND OBJECTIVES

Complementary foods for infants and young children (IYC) must provide essential nutrients in adequate quantities to support their development and well-being. However, commercially produced complementary foods (CPCFs) are increasingly preferred over home-prepared foods, due to their convenience and apparent safety, despite concerns about their nutritional quality. This study aimed to assess the nutritional quality of CPCFs sold in West African countries.

METHODS

This cross-sectional, descriptive study was conducted from August to October 2023 on CPCFs available in Benin, Mali, Mauritania, Niger, Senegal, and Togo. An exhaustive inventory of CPCFs was carried out in 315 sales outlets in these 6 countries. The levels of nutrients of concern (sugar, fat, and sodium) were recorded based on the information available on the product labels and compared with the European Nutrient and Promotional Profile Model (NPPM) recommendations. In addition, an interview survey was conducted among 736 mothers/caregivers enrolled at the exit of some of these outlets to determine whether nutritional information on product labels influenced their purchasing decisions.

RESULTS

A total of 659 products were identified, of which 77.7% were imported. Cereals (37.7%) and purees (25.9%) were the most common product categories, while snacks accounted for only 3.9%. Of the total of products collected, 6.5%, 17%, and 23.4% did not mention the total sugar, fat, and sodium content, respectively, on their labels. Compared to NPPM guidelines, 44.3% and 19.3% of products exceeded the recommended maximum thresholds for sodium and fats, respectively. Additionally, 41.6% exceeded the maximum recommended percentage of energy from sugars, and 33.7% contained added sugar. The interview RESULTS showed that only 13.8% of purchasers chose products on the basis of nutritional value, compared with 42.2% who do on personal preference and 31% on price.

CONCLUSIONS

This study highlights significant concerns regarding the nutritional quality of commercially produced complementary foods. It also shows that mothers/caregivers do not necessarily prioritize nutritional content when purchasing these products, despite their concerning nutritional profiles.

CONFLICTS OF INTERESTS

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OAP9_06

EARLY EFFECTS OF A SUGAR-SWEETENED BEVERAGE TAX ON CONSUMER BEHAVIOUR AND PUBLIC PERCEPTIONS: EVIDENCE FROM A NATIONAL SURVEY

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BACKGROUND AND OBJECTIVES

In 2023, Ghana, a sub-Saharan African country implemented a 20% excise duty tax on the price of sugar-sweetened beverages (SSBs) as part of wider efforts to reduce the purchase and consumption of such beverages and address the increasing burden of diet-related non-communicable diseases. This study assesses the early effects of this fiscal intervention on consumer purchasing and consumption behaviour and public perceptions of the tax.

METHODS

A cross-sectional survey using face-to-face interviews was conducted with a nationally representative sample (n= 2468; 18 years and above) in September 2024. Data were collected and analysed on SSB consumption patterns, awareness of associated health consequences, awareness of the SSB tax, and consumer reactions to price changes, including purchasing habits and beverage choices.

RESULTS

Most respondents (42.5%) reported consuming SSBs one to two times a week, with fewer (5.6%) consuming them daily. The study also found a high level of awareness among respondents (82.9%) regarding the health consequences associated with excessive SSB consumption. Overall, 84.4% had noticed an increase in the price of SSBs since April 2023 when the tax was implemented. In response to the tax's effect on product prices, 49.6% of respondents reported reducing their SSB purchases, and 31.3% reported switching to water or fresh fruits. While there was an almost even split in awareness among respondents of the SSB tax itself (47.1% aware vs. 52.9% unaware), majority of respondents (71.2%) still believed the tax was a good measure to improve public health.

CONCLUSIONS

The findings suggest that the SSB tax is influencing consumer behaviour and is broadly supported as a public health measure. To maximise the long-term influence of the tax on SSB purchase, consumption and related health outcomes, continued monitoring and public education campaigns are essential. The findings highlight the potential of SSB taxation to promote public health and may inform similar fiscal interventions in other low-to-middle-income country settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP9_07

CAN NUTRIENT ICONS AND EMOTICONS ON FRONT-OF-PACK NUTRITION LABELS (FOPNLS) FACILITATE THE SELECTION OF HEALTHIER PACKAGED FOODS AMONG CONSUMERS WITH LIMITED EDUCATION?

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BACKGROUND AND OBJECTIVES

FOPNLs are considered an important nutrition education tool globally to educate consumers and reduce the consumption of unhealthy packaged foods.Many FOPNLs are aimed at literate individuals, limiting their accessibility to disadvantaged population groups. This research aims to evaluate whether using nutrient icons and emoticons can make FOPNLs accessible for individuals with minimal or no formal education.

METHODS

The study was conducted in Rangareddy District, Telangana.It compared the Food Safety and Standards Authority of India-proposed FOPNL,featuring red and white blocks to indicate high and normal nutrient levels, to two other developed formats: Format 2 with nutrient icons in each block, and Format 3, in which red and white blocks were replaced with emoticons. Nutrient profiling of locally available packaged foods was conducted using the WHO SEARO Profiling Model to develop FOPNLs. Participants were randomly assigned an FOPNL format and made food selections based on the assigned format. In Activities 1 and 2, they chose one product out of five in each category-first without and then with instructions to select the healthier option. Activity 3 required identifying products with excessive content of a specific nutrient. For identification of healthy products each time, participants were awarded +10 score. All the participants also rated the three FOPNLs based on how simple they were to underdtand.The total quiz scores of all the three activities were compared using ANOVA post-hoc tests with Tukey-Kramer adjustment on IBM SPSS.

RESULTS

In total, 148 individuals participated in the study: Group1(n=59), Group2(n=45), and Group3(n=44).FOPNL 3 with emoticons was rated as easiest to understand by two groups (group2=57%;groupt3=58%), but activity-wise total scores indicate Format 2 was most effective in assisting the participants for choosing healthier foods (group 1 total quiz score =41.69±15.8; group 2 total quiz score =71.5±16.6; and group 3 total quiz score =53.41±18.0) [all p-values <0.001].

CONCLUSIONS

The research demonstrates effectiveness of modified FOPNLs on packaged foods for assisting individuals with limited education in making healthy food choices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP9_09

ASSOCIATIONS BETWEEN NUTRITION KNOWLEDGE, HOUSEHOLD FOOD INSECURITY AND DIET QUALITY AMONG ADOLESCENTS IN URBAN AND RURAL FOOD ENVIRONMENT IN KENYA

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BACKGROUND AND OBJECTIVES

The prevalence of overweight and obesity among adolescents has been rising globally, increasing their vulnerability to non-communicable diseases (NCDs). A nutrition transition towards nutrient-poor, energy-dense diets has fuelled this trend. In sub-Sahara Africa, limited research exists on adolescents' diet quality (DQ) and its determinants in rural and urban areas. This study assessed the association between adolescents' nutrition knowledge (NK), food insecurity (FI) and DQ across Kenya's urban and rural food environments (FE).

METHODS

A cross-sectional survey was conducted among 210 and 610 Kenyan adolescents in rural and FE respectively. Interviews assessed the adolescents' NK, focussing on foods that contribute to or protect against NCD risk. Household FI was assessed using the Food Insecurity Experience Scale. Diet quality was assessed through a 24-hour repeated dietary recall, analysed based on Global Diet Quality Scores (GDQS). The computation included Overall GDQS, GDQS+ and GDQS- representing overall DQ, healthy food consumption and unhealthy food consumption, respectively. Associations were tested using linear regression in R.

RESULTS

The overall GDQS was significantly higher among rural adolescents (RA) (rural: 19.02±3.13; urban: 16.05±3.54, $p < 0.001$). Similarly, GDQS+ was significantly higher among RA (rural: 7.00±2.71; urban: 5.73±2.98, $p<0.001$). Urban adolescents (UA) consumed more unhealthy foods, as indicated by significantly low GDQS- scores (rural: 12.01±1.49; urban: 10.32±1.75, $p<0.001$). Urban adolescents had significantly ($p<0.001$) higher nutrition knowledge than RA. Among RA, knowledge of foods contributing to NCD risk showed a positive association with the overall GDQS ($\beta = 0.4330$, $p<0.001$) and GDQS+ ($\beta = 0.3325$, $p<0.001$). However, there was no significant association with GDQS-. Knowledge about vitamins and minerals relevant for nutritional health among RA showed no significant associations with consumed diet. Knowledge of foods contributing to NCD risk showed a negative association with GDQS- score (β=-01190, $p<0.0.05$). Food insecurity had a negative association with the GDQS+ score among UA (β= -0.1033, $p<0.001$).

CONCLUSIONS

Adolescent diets, particularly in urban areas, are of low quality. Therefore, targeted policy interventions are needed to improve DQ and promote adolescent health. Knowledge of foods contributing to NCD risks showed a significant association with DQ and could enhance nutrition advocacy messaging aimed at improving DQ among adolescents.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 10 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP10_01

ASSOCIATION AND LONGITUDINAL EFFECTS OF DIET QUALITY ON HEALTHY AGING - FOCUS ON CARDIOMETABOLIC HEALTH - FINDINGS FROM THE CANADIAN LONGITUDINAL STUDY ON AGING (CLSA)

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BACKGROUND AND OBJECTIVES

Healthy aging is a pressing public health issue, with diet playing a critical role in mitigating health outcomes, including cardiometabolic diseases such as hypertension (1-3). This study investigated the longitudinal association between diet quality and healthy aging, using data from the Canadian Longitudinal Study on Aging (CLSA) (4, 5), a database comprising >50,000 participants from all parts of Canada. We hypothesized that especially a higher Mediterranean Diet Score (MDS) would be associated with improved blood pressure measurement (BPMs) over time.

METHODS

CLSA participants aged 45-85 years at baseline were followed for up to nine years. MDS (6) was based on responses to the Short Diet Questionnaire (SDQ), a validated tool that provided an overview of individual dietary habits (7). Systolic/diastolic blood pressures (SBP/DBP) were measured, and Mean Arterial Pressure (MAP) was calculated as DP + 1/3(SP – DP) (8) at three-time points: baseline (2010), follow-up 1 (2015), and follow-up 2 (2018). Linear mixed models (LMMs) and latent change score models (LCSMs) were employed to examine the association and longitudinal effect of MDS on MAP, adjusting for age and sex, among others. The latent variables MDS_change1 and MDS_change2 represent the changes in the MDS at follow-up 1 and follow-up 2, respectively, while MAP1 and MAP2 represent the MAP at the same time points. These latent variables were scaled to 1, i.e., their variances were fixed as reference points to allow estimating changes in MDS and MAP over time.

RESULTS

25,377 participants completed all three waves and were included. A 1-unit increase at baseline in MDS (out of a maximum of 50) was associated with a 0.065 mmHg reduction in MAP (coefficient = -0.065); older age was linked to a 0.048 mmHg increase in MAP/year (coefficient = 0.048), and male sex was associated with 3.999 mmHg higher MAP vs. females. For MAP1, sex remained a significant predictor, but changes in MDS and age at follow-up 1 were not. For MAP2, a significant negative association was found between changes in MDS and MAP, with each 1-unit increase in MDS_change2 linked with a reduction in MAP by 0.039 mmHg. Similar significant RESULTS were found for DBP and SBP.

CONCLUSIONS

Higher adherence to the MD was associated with lower BPMs over time, even after controlling for confounding variables. The study highlights the importance of diet quality in promoting healthy aging and mitigating cardiometabolic risk, emphasizing the benefits of dietary interventions for reducing the burden of chronic diseases in aging populations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP10_02

TRAQQ: AN INNOVATIVE ECOLOGICAL MOMENTARY DIETARY ASSESSMENT APP; A POTENTIAL NEW TOOL FOR CROSS-COUNTRY DIETARY DATA COLLECTION

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BACKGROUND AND OBJECTIVES
Current dietary assessment METHODS are prone to memory-related bias and heavily burden respondents. To address these limitations, we developed Traqq, an innovative ecological momentary dietary assessment (EMDA) smartphone app that enables (near) real-time dietary assessment. Specifically, we implemented a 2-hour recall (2hR) methodology to reduce reliance on memory and lower respondent burden. This work focuses on validating the 2hR method against traditional 24-hour recalls (24hRs) and objective biomarkers. As Traqq's flexible design also allows customization for diverse research objectives, including adaptation to different countries. We also propose a standardized approach to adapt Traqq for use in different countries, including a usability evaluation.
METHODS

The 2hRs were validated in 215 Dutch adults on 6 randomly selected non-consecutive days (i.e., 3 2hR-days and 3 24hRs) during a 4-week period. Sixty-three participants provided 4 24-h urine samples, to assess urinary nitrogen and potassium concentrations. In addition, a standardized process was applied, in consultation with local nutrition experts, encompassing: 1) development of country-specific food lists, 2) creation of country-specific portion size suggestions, 3) translation of the app, and 4) integration, pilot testing, and refinement. System usability scale (SUS) was used to assess usability of each version.

RESULTS

Intake estimates of energy (2052±503 kcal vs. 1976±483 kcal) and nutrients (e.g., protein: 78±23 g vs. 71±19 g; fat: 84±30 g vs. 79±26 g; carbohydrates: 220±60 g vs. 216±60 g) were slightly higher with 2hR-days than with 24hRs. Comparing self-reported protein with urinary protein indicated a slightly higher accuracy of 2hR-days than 24hRs (−14% vs. −18%). The adaptation process resulted in the development of Traqq versions for Austria, Belgium (Flanders), Denmark, Finland, Germany, Greece, Norway, Poland, Spain, Sweden, and Switzerland (German). User evaluation showed an above-average usability for most versions (SUS>68).

CONCLUSIONS

Comparing 2hR-days with 24hRs showed a relatively similar group-level bias for energy, most nutrients, and food groups, with differences primarily driven by higher intake estimates from 2hR-days. Biomarker comparisons showed less underestimation by 2hR-days compared to 24hRs, suggesting that 2hR-days are a valid approach. The EMDA app, Traqq, offers an alternative to traditional 24-hour recalls, providing more accurate dietary intake data, reducing respondent burden, and simplifying cross-country dietary intake comparisons.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP10_03

VITAMIN A, D, AND E INTAKES, SERUM CONCENTRATIONS, AND BREASTMILK STATUS IN BREASTFEEDING WOMEN IN IRELAND

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BACKGROUND AND OBJECTIVES

Breastfeeding is universally recommended as it delivers the best combination of nutrients and bioactives for infants. However, maternal diet and nutrition status impacts concentrations of some nutrients in breastmilk such as the fat soluble vitamins A, D, and E. Given the limited evidence and the high degree of inter-individual variation, it is important to understand the relationship between dietary intakes, vitamin status in serum and breastmilk, and health outcomes. This understanding can help improve targeted nutritional interventions that promote maternal and infant health and well-being.

METHODS

Demographics, dietary intake data, serum and breastmilk were collected in a 4-week randomised control trial from lactating women in the first 2 months post-partum (LS-23-07-OSullivan). Participant vitamin intakes were assessed using FoodBook24 self-completed 24-hour recalls. Vitamin A, D and E concentrations were quantified using LC-MS/MS in serum and breastmilk. Data was analysed using IBM SPSS Statistics (version 27).

RESULTS

Data from 44 participants indicated that maternal vitamin A, D and E intakes are low. Only 9%, 4% and 52% of participants were meeting intake recommendations for vitamins A, D, and E, respectively. Mean serum concentrations were sufficient at 58.9±20.7nmol/L, 2.1±0.4µmol/L, and 45.2 ±9.7µmol/L. Concentrations of breastmilk were low at 0.5 ±0.2µmol/L and 15.3 ±7.4µmol/L for vitamins A and E, and below the detection limit for vitamin D.

CONCLUSIONS

Intakes of vitamins A, D and E are poor, and it appears habitual diet alone is insufficient to achieve the daily vitamin D requirements, even when supplements are consumed. Despite sufficient serum status, concentrations in breastmilk are low and warrant further investigation. A combination of approaches including nutrition education, supplementation strategies, and the introduction of food fortification policies may be a feasible method for improving intakes and status across the population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP10_04

A Mixed-METHODS Investigation of Infant and Young Child Feeding Practices in Rural Ethiopia: Integrating Insights from Surveys, Direct Observations, and Qualitative Research

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BACKGROUND AND OBJECTIVES

Optimal infant and young child feeding (IYCF) practices are fundamental to child survival and development. While self-reported data form the basis for most IYCF assessments, their reliability, and underlying sociocultural determinants remain poorly understood in resource-limited settings. This study employed a multi-method approach to assess IYCF practices and elucidate contextual factors influencing feeding behaviors in rural Ethiopia.

METHODS

We conducted a prospective cohort study of 106 mother-infant dyads (December 2020–June 2022), combining monthly surveys with standardized 10-hour feeding observations of 79 infants. Qualitative inquiry comprised 26 semi-structured interviews and five focus group discussions with mothers, grandmothers, and community leaders (January–February 2024). Statistical analyses evaluated practice concordance, while thematic analysis identified behavioral determinants.

RESULTS

Self-reported surveys revealed colostrum consumption for 95% of infants and early breastfeeding initiation among 66%, yet 67% reported prelacteal feeding of their infant. Based on self-reported 24-hour recall data, 70% of mothers reported exclusive breastfeeding (EBF) of the infant during the first six months. However, using a stricter definition, which includes colostrum, the timing of breastfeeding initiation, and prelacteal feeding, the rate of EBF in this population fell to a significantly lower rate of 18% ($p=0.002$). Complementary feeding was timely among 55% of infants; of untimely introduction, 67% were introduced early (<6 months) and 33% late (>8 months). Direct observations showed 83% of infants <6 months receiving complementary foods. Among EXCAM infants under six months of age classified as EBF based on 24-hour recall data (n=39), 67% were observed receiving complementary foods. Qualitative findings revealed that prelacteal feeding was deeply rooted in cultural symbolism, endorsed by 67% of traditional healers and 50% of religious leaders, despite opposition from 40% of mothers. Economic pressures and entrenched cultural norms influenced early complementary feeding and deviations from recommended practices.

CONCLUSIONS

This study reveals substantial discordance in EBF rates when using refined definitions, emphasizing the need for standardized multi-method assessments. Future interventions must integrate cultural practices, particularly regarding prelacteal feeding, to effectively improve child nutrition outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP10_05

EFFECTS OF MATERNAL PROBIOTICS AND OMEGA-3 FATTY ACIDS SUPPLEMENTATION DURING PREGNANCY THROUGH 6 MONTHS POSTPARTUM ON COVID-19 PREVALENCE AND NEUTRALIZING ANTIBODIES

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BACKGROUND AND OBJECTIVES

Pregnant and lactating mothers are vulnerable to SARS-CoV-2 infection. Probiotics and omega-3 fatty acids (FAs) may act synergistically to improve immune responses among these populations. We evaluated the effects of maternal probiotics and omega-3 FAs supplementation during pregnancy through 6 months postpartum on COVID-19 prevalence and neutralizing antibodies among mothers.

METHODS

We conducted a double-blind, randomized controlled trial involving pregnant women at seven health centers in Jakarta, Indonesia. A total of 314 mothers in their second trimester of pregnancy were enrolled and randomly assigned to one of two intervention groups. The intervention groups received a daily probiotics [*Lactobacillus rhamnosus* GG, *Bifidobacterium animalis subsp. lactis* (BB-12), *L. acidophilus* (LA-5)] along with a higher-dose of omega-3 FAs (480 mg DHA, 720 mg EPA). The control group received a placebo with a standard-dose of omega-3 FAs (240 mg DHA, 360 mg EPA). During the intervention period, study physicians and local health centers recorded diagnoses of COVID-19 confirmed by PCR. We assessed neutralizing antibodies to SARS-CoV-2 in a subsample of 176 mothers before and after intervention. General linear models were used to determine the intervention's effects. We included potential confounders, such as socioeconomic and nutritional status, in the adjusted analyses if they had associations with $p<0.2$.

RESULTS

The mean age of mothers was 29.8 ± 5.16 yo in the intervention and 29.3 ± 5.45 yo in the control group, with 80.2% of participants in both groups having ≥ 9 years of education. The baseline characteristics were comparable between groups. Completion rates were 91.1% for the intervention and 84.1% for the control group. The COVID-19 prevalence in the intervention group was significantly 60% lower than the control group (11 vs. 22 cases; aOR 0.40, 95%CI 0.17 to 0.88; p=0.027). At the end of the intervention period, the intervention group exhibited a lower inhibition response to SARS-CoV-with a mean difference of -10.17 (95%CI -20.1 to -0.23; p=0.045) and a smaller change in induced responses from baseline to endline (-7.59, 95%CI -15.12 to -0.06; p= 0.048) compared to the control group.

CONCLUSIONS

Combined probiotics and omega-3 FAs supplementation protected pregnant and lactating mothers from COVID-19 in a community setting. The intervention led to a lower antibody response, indicating that its protective effect may not depend on enhancing antibody production.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP10_06

Impact of targeting strategies for balanced energy protein supplementation in pregnancy on weight gain in pregnancy: RESULTS of a cluster randomized controlled trial in rural Bangladesh

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BACKGROUND AND OBJECTIVES

Balanced energy-protein (BEP) supplementation is recommended by WHO for pregnant women in undernourished populations to promote gestational weight gain and reduce low birth weight. BEP supplementation is known to result in modest weight gain in pregnancy but the effectiveness of targeted supplementation based on body mass index or weight gain in pregnancy has not been assessed. We aim to assess the effects of targeted and untargeted BEP supplementation compared to MMS on weight gain.

METHODS

A cluster-randomized controlled trial in rural Bangladesh compared different targeting approaches during pregnancy of daily fortified BEP supplementation (15 nutrients at 1 RDA; 500 mg calcium; ~400 kcal; ~15 g protein) vs. daily multiple micronutrient supplements (MMS) using the UNIMMAP formulation. Starting at 12 weeks of gestation until pregnancy outcome, pregnant women aged 15-35 years living within the study area were randomly assigned to receive (1) MMS (control), (2) BEP, (3) BEP for those with pre-pregnancy body mass index (BMI) < 18.5 kg/m2, while those with a pre-pregnancy BMI ≥ 18.5 kg/m2 received daily MMS or (4) BEP for those with pre-pregnancy BMI < 18.5 kg/m2, MMS for others, with a switch to BEP if inadequate gestational weight gain was identified. Weight gain in pregnancy was measured by community health workers during home-based visits scheduled at the 8 WHO-recommended ANC contacts. Inadequate weight gain was calculated using the INTERGROWTH-21st reference for women with normal pre-pregnancy BMI, and IOM standards for women with pre-pregnancy BMI<18.5 or >25 kg/m2. Weight gain will be analyzed across arms using linear regression and Relative risk ratios (RRR's) for the proportion with inadequate GWG, both using generalized estimating equations to account for cluster design.

RESULTS

In total 3390 pregnant women were enrolled in the trial (age 23.6±5.4 years, BMI 21.8 ± 3.7kg/m2, gestational age at enrollment 9.9±3.6 weeks) and baseline characteristics were balanced across groups. Pregnancy follow-up will conclude in March 2025. RESULTS of the impact of fortified BEP supplementation (both targeted and untargeted) vs. MMS will be presented.

CONCLUSIONS

Findings will examine the effectiveness of different targeting approaches of BEP supplementation on maternal weight gain in pregnancy, informing future programs and recommendations from WHO.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP10_07

NUTRITIONAL INTAKE OF ADULTS LIVING IN FOOD INSECURITY IN DEVELOPED COUNTRIES: A SCOPING REVIEW PROTOCOL

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BACKGROUND AND OBJECTIVES

It is well known that diet quality plays an important role in growth, development and future health of children. However, some families with children face difficulties in meeting their nutritional needs due to financial constraints. As a result, these families are exposed to food insecurity, which is defined as "limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways". Food Insecurity is a phenomenon that is rising not only in the Global South but also in the Global North. Despite this, there is limited literature exploring quality of diet in the context of food insecurity. This scoping review aims to examine the link between food insecurity and dietary quality among children residing in developed countries.

METHODS

The scoping review will follow the PRISMA-ScR guidelines for systematic reviews and will be supported by recommendations from the Joanna Briggs Institute (JBI). Our team will identify key terms relevant to the variables of food insecurity, dietary quality, and children, and will establish inclusion and exclusion criteria. The search strategy will primarily involve using three scientific databases, but will also include hand-searching and checking reference lists. EndNote will be used to capture all found articles during the preparation stage. Articles unrelated to developed countries, based on The World Bank classification of countries, will be removed, following the screening of titles and abstracts. We will focus on original articles written in English that assess and analyze food insecurity and dietary intake among children aged 5-18. The selected articles will then undergone full reading and a critical appraisal. The final list of selected articles will be exported to an Excel file for processing.

RESULTS

An information extraction sheet will be created from the final selected articles to capture all relevant details related to the research question. The findings will be presented in both narrative form and through diagrams and tables. The study population will be described based on the available research on the topic. Descriptive statistics will be used to report main characteristics of the RESULTS regarding diet quality and potential nutritional defficiencies that this population group faces due to food insecurity in daily life. This approach will help identify key needs, and gaps in research and suggest possible actions.

CONCLUSIONS

The findings will contribute to the discussion on inequalities and the rigth to food within the context of the Sustainable Development Goals, specifically for this vulnerable group, even in developed countries.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP10_08

WEIGHT CHANGES OVER A 5-YEAR PERIOD IN THE NUTRINET BRASIL COHORT STUDY: DESCRIPTION AND ASSOCIATED FACTORS

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BACKGROUND AND OBJECTIVES

Ultra-processed foods (UPF) have been linked to several negative health outcomes, including weight gain. Behavioral interventions targeting UPF consumption may be an effective strategy for obesity prevention. The NutriNet Brazil Study, a web-based cohort launched in 2020, follows Brazilian adults to explore the association between local dietary patterns and chronic diseases. This cohort provides a unique opportunity to investigate the impact of behavior change interventions on weight through a nested randomized clinical trial, particularly targeting individuals with high UPF consumption and at higher risk of weight gain. This study aims to describe five-year weight changes and associated sociodemographic factors among NutriNet Brazil Cohort participants who present high intake of UPF.

METHODS

This analysis included adults (18 to 60 years old) who completed at least five years of follow-up, did not go through any pregnancy in this period, and consumed a percentage of calories from UPF above the median of the cohort;s consumption at baseline, based on the average of two self-completed 24-hour dietary recalls. Weight and height were self-reported at baseline, with weight updated every six months. Relative weight change was calculated as the difference between follow-up weight and baseline weight, divided by baseline weight, expressed as a percentage. Multivariate logistic regression was used to identify associations between a ≥5% weight gain and baseline body mass index (BMI), age, gender, ethnicity, and income.

RESULTS

Included participants (n = 4314) gained, on average, 2,4% (sd = 1,8) of their body weight over the five-year period, with 25,1% gaining 5% or more. The likelihood of gaining ≥5% of body weight was lower among people above 39 years old (OR = 0,52; CI95% 0,48 to 0,54; ref = 18 to 39 years old) and those with obesity at baseline (OR = 0,73; CI95% 0,61 to 0,87; ref = eutrophic), and higher among Black individuals (OR = 1,23; CI95% 1,06 to 1,43; ref = white). Gender and income were not significantly associated with weight gain in this cohort.

CONCLUSIONS

Younger adults (up to 39 years old) and those with a baseline BMI up to 29 kg/m² are at higher risk of weight gain in the NutriNet Brazil Cohort Study. Early adulthood is a critical window for obesity prevention, making it an ideal target group for behavioral interventions aimed at obesity prevention.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 15 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP15_05

DETERMINANTS OF INADEQUATE AND EXCESSIVE GESTATIONAL WEIGHT GAIN ACROSS SIX COUNTRIES IN SOUTHEAST ASIA AND AFRICA: A PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES

Adequate gestational weight gain is essential for fetal development; both inadequate gestational weight gain (I-GWG) and excessive gestational weight gain (E-GWG) can have significant adverse effects on fetal and birth outcomes. The literature for understanding factors linked to both I-GWG or E-GWG in low- and middle-income countries (LMICs) is limited. This study aims to identify risk factors for I-GWG and E-GWG.

METHODS

We analyzed data from the ongoing Pregnancy Risk and Infant Surveillance and Measurement Alliance (PRISMA) open cohort study in Ghana, Kenya, India, Pakistan, and Zambia. Early pregnancy Body Mass Index (BMI) was estimated by weight measure at or before nine weeks gestation, or imputed using a mixed-effects restricted cubic spline model for measures taken between 10 - 20 weeks gestation. The Institute of Medicine BMI-specific guidelines were used to determine weight gain adequacy. A multi-level multinomial model was used to assess the impact of demographic, clinical, and nutritional risk factors.

RESULTS

5,134 women with a pregnancy outcome were included. The median age was 26 years, mean gestational age at enrollment was 13±3.6 weeks, and mean early pregnancy BMI was 23.5 kg/m2. The prevalence of I-GWG and E-GWG were 37% and 33%, respectively. Women at an increased risk for I-GWG were aged 25-29 (RR 1.21 (95%CI 1.02, 1.45)) or 35+ (RR 1.50 (95%CI 1.19, 1.90)), HIV+ (RR 1.67 (95%CI 1.23, 2.26)), unmarried (RR 1.50 (95%CI 1.10, 2.04)), farmers (RR 1.75 (95%CI 1.17, 2.63)), had previously given birth >2 times(RR 1.27 (95%CI 1.07, 1.50)), had moderate anemia during the third trimester (RR 1.25 (95%CI 1.04, 1.49)), or had low ferritin during pregnancy (RR 1.24 (95%CI 1.02, 1.51)). Risk of E-GWG increased among women who were 20-24 years old (RR 1.41 (95%CI 1.01, 2.00)), unemployed (RR 1.32 (95%CI 1.02, 1.70), or in the highest wealth quintile (RR 1.67 (95%CI 1.18, 2.33).

CONCLUSIONS

Findings highlight that nutritional status related to anemia and iron deficiency is associated with I-GWG, in addition to advanced maternal age, multiparity, marital status and HIV status. On the other hand, maternal age, employment status, and higher wealth index is associated with E-GWG risk. Our findings suggest the need for targeted interventions for specific groups at risk of I-GWG or E-GWG. Nutrition counseling should focus on women who are older, multiparous, HIV+, and/or anemic. For those at risk of I-GWG, balanced energy and protein supplements should be an integral part of antenatal care.

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CONFLICTS OF INTERESTS

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OAP15_01

IMPACT OF A TIMED AND TARGETED CARE FOR FAMILY (TTCF) PROGRAM ON MATERNAL AND CHILD NUTRITION AND HEALTH IN EASTERN VISAYAS, PHILIPPINES

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BACKGROUND AND OBJECTIVES

Timed and Targeted Care for Families (ttCF) is a contextualized, family-inclusive, and gender-transformative behavioral communication approach. Trained Barangay Health Workers (BHWs) delivered ttCF nutrition and health messages through home visits in Eastern Visayas, Philippines (2021–2025). This study evaluated the impact of the ttCF program on maternal and child health and nutrition outcomes during the first 1,000 days of life.

METHODS

A quasi-experimental design was used involving 12 municipalities (6 intervention and 6 comparison areas) with 1518 women (458 pregnant and 1050 postpartum mothers <12 mo. In the intervention areas, BHWs trained in ttCF conducted 12 household visits from pregnancy until 2 years of child age. In the comparison areas, only routine health services were provided. Linear regression analyses adjusted for baseline differences in outcomes and socio-economic covariates were used to estimate program impact. The primary outcomes included child minimum dietary diversity (MDD; consumption of ≥4 out of 7 food groups including breastfeeding), and the prevalence of stunting and wasting. Secondary outcomes were maternal MDD (≥5 out of 10 food groups), mid-upper arm circumference (MUAC)<23 cm, and depressive disorder [defined as Edinburgh Postnatal Depression Scale (EPDS)≥9].

RESULTS

Out of 1518 women, 1313 (655 in comparison and 658 in intervention) were followed up 12 months after enrollment. The number of home visits by BHWs was higher in the intervention vs. comparison areas between birth to 6 mo postpartum [mean=2.6 (sd 2.0) vs. 1.3 (1.4)] and >6 mo postpartum [2.3 (2.0) vs. 1.4 (1.5); all p<0.001]. In intention-to-treat analysis, no significant differences were found between the intervention and comparison areas for child MDD (23.2% vs. 24.9%; p=0.4 at follow-up only), and the prevalence of stunting [adjusted difference (adiff)=-2.6 percentage point (pp); 95%CI: -7.7, 2.5] or wasting (adiff=1.4 pp; 95%CI: -5.0, 7.4) among children between intervention and comparison groups. At maternal level, there was no difference between two areas in MDD (adiff =-6.1 pp; -12.8, 0.6) or MUAC<23 cm (adiff=-0.0 pp; 95%CI:-0.0, 0.0). However, ttCF home visits reduced the proportion of depressive disorder by 12.5% (95%CI: -19.4, -5.6) and EPDS by -1.2 score (95%CI: -1.9, -0.5), adjusting for enrollment differences in outcomes.

CONCLUSIONS

ttCF approach in the Eastern Visayas increased the number of home visits by BHWs and reduced maternal mental disorders. However, its impact on key maternal and child nutrition and health outcomes during the first 1000 days was limited.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP15_03

THE TYPE OF FOOD SUPPLY ESTABLISHMENTS, A KEY FACTOR IN THE LEVEL OF PROCESSING OF PURCHASED FOODS AND BEVERAGES

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BACKGROUND AND OBJECTIVES

Several studies have examined the relationship between the availability of establishments in the modern food supply system and diet quality or purchases of these foods (1,2), but the impact of traditional food supply systems remains less understood (3). This study explores whether the association between traditional types of establishments (small grocery stores, specialized stores, bakeries, *tortillerias*, territorial and street markets) and household purchases of ultra-processed foods and beverages differs from that observed for modern establishments (supermarkets, discount stores, warehouse stores, convenience stores) in a representative sample of the population of a middle-upper-income country in 2020-2022.

METHODS

Food purchases were estimated based on the information from a nationally representative household income and expenditure survey (4). The densities for each type of establishments (density=#establishments/population) were calculated at the municipal level based on the national directory of economic units (5), except for territorial and street markets, which were estimated based on the municipal census. Two-part models (6) were used to test the associations between establishment densities and household purchases of ultra-processed foods, beverages, and fruits/vegetables, adjusting for sociodemographic factors.

RESULTS

The densities of convenience and discount stores were significantly associated with higher purchases of ultra-processed food (1.1 gr, $p<0.05$; 0.7 gr, $p<0.05$) and ultraprocessed sugar sweetened beverages (15.3 gr, $p<0.05$; 8.4 gr, $p<0.05$). Instead, specialized stores in animal origin food were significantly associated with less purchases of this products. On the other hand, the densities of convenience stores, discount stores and supermarkets were significantly associated with lower purchases of fruits and vegetables (-10.5 gr, $p<0.05$; -4.9 gr, $p<0.05$; -5.2 gr, $p<0.05$), while specialized stores in animal origin food, fruits/vegetables/seeds, other foods, and *tortillerias* were significantly associated with higher purchases of fruits and vegetables (5.5 gr, $p<0.05$; 7.5 gr, $p<0.05$; 8.2 gr, $p<0.05$, 1.6 gr, $p<0.05$). The RESULTS for warehouse clubs and small grocery stores were opposite to the common pattern of the other categories within the same modern/traditional types.

CONCLUSIONS

These findings suggest that greater availability of convenience and discount stores may encourage less healthy purchasing patterns, underscoring the need to revitalize the traditional food supply system, generally linked to healthier purchasing behaviours. Moreover, efforts should be made to improve the offerings of traditional small grocery stores.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP15_04

INTERACTION BETWEEN THE ENUTRI DIET QUALITY SCORE AND APOLIPOPROTEIN E GENOTYPE ON CARDIOMETABOLIC DISEASE RISK MARKERS: A CROSS-SECTIONAL ANALYSIS IN UK ADULTS

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BACKGROUND AND OBJECTIVES

Evidence suggests that *APOLIPOPROTEIN (APO)E* genotype impacts on lipid responses to dietary fat manipulation [1-4], but its role in the relationship between diet quality and cardiometabolic disease (CMD) risk remains unclear. Therefore, this secondary data analysis aimed to explore the interaction between the *APOE* genotype and the eNutri diet quality score (DQS) on CMD risk markers in UK adults.

METHODS

Baseline data from four randomised controlled trials and one observational study conducted at the University of Reading in disease-free UK adults (n=621) aged 18-70 years were compiled. From weighed diet records, diet quality was assessed using the UK-based eNutri DQS consisting of 11 food and nutrient components (higher scores represent higher diet quality). *APOE* genotyping (rs429358, rs7412) was determined retrospectively, and participants were grouped according to *APOE* genotype group (*E2* carriers, wild-type *E3/E3* and *E4* carriers) for the main effect of genotype, and the *APOE* x eNutri-DQS interaction. Participants were first stratified into tertiles (T) of adherence to the eNutri-DQS before a general linear model was performed to assess the *APOE* x eNutri-DQS interaction on CMD risk factors, which included adjustment for confounding variables. If interactions were significant ($P<0.05$), pairwise comparisons with Bonferroni correction were conducted.

RESULTS

Significant *APOE**eNutri-DQS interactions were observed for waist circumference (WC), waist:height ratio (WHtR), waist:hip ratio (WHR) and fasting glucose ($P<0.05$). WC and WHtR were significantly lower in eNutri-DQS T3 versus T1 and T2 in *E4* carriers ($P=0.001$), and versus T2 only in *E2* carriers ($P=0.027$ and $P=0.036$, respectively). The WHR was lower in T3 compared with T1 and T2 in both *E2* ($P=0.003$) and *E4* carriers ($P=0.007$), and between T2 and T1 in the *E3/E3* group ($P=0.008$). In *E4* carriers, T3 had lower mean fasting glucose concentrations than T2 ($P=0.042$).

CONCLUSIONS

Our findings suggest that, in *E2* and *E4* carriers, higher diet quality was associated with lower central adiposity, estimates of body fat distribution and fasting glucose (*E4* carriers only), with little impact on CMD risk markers in the *E3/E3* group. Further research is warranted, employing a prospective genotyping approach to explore the underlying mechanisms and validate these observations.

CONFLICTS OF INTERESTS

Arife Yilmaz, Michelle Weech, and Kim Jackson declare that they have no conflicts of interest.Julie Lovegrove is the Deputy Chair of the UK Government's Scientific Advisory Committee on Nutrition (SACN).

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OAP15_06

ASSOCIATIONS BETWEEN SERUM LIPID PROFILE AND COGNITIVE FUNCTION IN OLDER ADULTS FROM THE ENGLISH LONGITUDINAL STUDY OF AGEING (ELSA)

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BACKGROUND AND OBJECTIVES

Maintaining optimal cognitive function is an essential part of healthy ageing. Abnormal blood lipid profile such as elevated LDL-cholesterol (LDL-C), elevated triglycerides (TG) and reduced HDL-cholesterol (HDL-C) levels can lead to simultaneous increases in endothelial dysfunction and/or chronic inflammation, both of which are independent risk factors for cognitive impairment through reduction in neuronal plasticity and pathogenesis of cerebral microvascular diseases (1, 2). However, the associations to date between individual lipid profile components and various cognitive function measures have been equivocal, which warranted further investigation in large epidemiological cohorts.

METHODS

Using data from Wave 4 (2007-2008) of the English Longitudinal Study of Ageing (ELSA) study (3), 5642 individuals with complete data for serum lipid profile (Total cholesterol, LDL-C, HDL-C, TG) and cognitive function measures (memory performance, executive function, mental speed etc.) were included in the final analyses. Multiple linear regression analyses were used to explore associations between lipid profile and cognitive measures, controlling for key covariates such as HbA1c, physical activity, BMI, ethnicity and education.

RESULTS

Higher levels of HDL-C were consistently associated with better cognitive performance across multiple cognitive function domains including memory performance, executive function (both $p \leq 0.001$) and mental speed ($p \leq 0.01$). On the contrary higher level of TG were associated with diminished cognitive performance (both $p \leq 0.05$). The negative association of TG with various cognitive domains were particularly apparent in older females (≥70 years). Surprisingly, we also found positive associations between memory performance with both total and LDL-cholesterol (both $p \leq 0.05$) as well as positive association between executive function and LDL-cholesterol ($p \leq 0.05$).

CONCLUSIONS

This study has demonstrated consistent associations between various parameters of serum lipid profile with multiple cognitive function domains, with the relationships being modulated by both gender and age. This creates opportunities for developing stratified lifestyle interventions to modify lipid profile parameters and thereby improve cognitive function as part of healthy ageing. The positive associations between serum LDL-C and various cognitive function domains warrants further investigation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP15_07

CHANGE IN SUGAR-SWEETENED BEVERAGES AND NONESSENTIAL ENERGY-DENSE FOOD PURCHASES BY TYPE OF STORE, AFTER THE IMPLEMENTATION OF TAXES IN MEXICO

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BACKGROUND AND OBJECTIVES

In 2014, the Mexican government implemented a tax on sugar-sweetened beverages (SSB) of one peso per liter and an 8% tax on nonessential energy-dense foods (NEDF). Prior studies have evaluated these taxes on household purchases, but none have considered the potential heterogeneity by type of store with national survey data. We aimed to estimate the association of the taxes on purchases in Mexican households by store type.

METHODS

We analyzed the Mexican National Household Income and Expenditure Survey (ENIGH, for its Spanish acronym) from 2008 to 2018. To estimate changes in purchases overall and by store type, we used a two-part model to assess the probability of purchase and the amount purchased among purchasers, and we stratified the models by type of store to assess the potential effect modification.

RESULTS

After the implementation of the taxes, purchases of NEDF and SSB decreased by 7.0 and 4.4%, respectively. There was also a slight decrease in purchases of untaxed foods (-1.7%), while untaxed beverages rose by 10.9%. The largest reductions for taxed foods were found in “small neighborhood stores” (-19%; -7.6 g/capita/week). For SSB “public markets” showed the largest decrease -22.7%, (-4.7 ml/capita/week), followed by “small neighborhood stores” (-11.4%, -84.3 ml/capita/week) (Table 1).After the implementation of the taxes, purchases of NEDF and SSB decreased by 7.0 and 4.4%, respectively. There was also a slight decrease in purchases of untaxed foods (-1.7%), while untaxed beverages rose by 10.9%. The largest reductions for taxed foods were found in “small neighborhood stores” (-19%; -7.6 g/capita/week). For SSB “public markets” showed the largest decrease -22.7%, (-4.7 ml/capita/week), followed by “small neighborhood stores” (-11.4%, -84.3 ml/capita/week) (Table 1).

CONCLUSIONS

Heterogeneity in purchases by store types suggests the need to enforce mechanisms taken at the food retail level focused on discouraging purchases of these products, and updating the tax design to encourage reductions in their purchases further.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP15_08

BARRIERS AND FACILITATORS TO HEALTHY EATING AMONG UKRAINIAN REFUGEE CHILDREN IN FINLAND: COMBINED QUALITATIVE AND QUANTITATIVE ANALYSES

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BACKGROUND AND OBJECTIVES

The Russian invasion of Ukraine has caused Europe's largest child displacement since WWII. War-related stress and acculturation may affect children's eating behaviors (EB). Our 2023 study of 4,854 children in Ukraine showed that 63% experienced EB changes during the war (Gulich et al., 2024). This follow-up study aims to: (1) identify changes in eating patterns among Ukrainian school children relocated to Finland, and (2) examine barriers and facilitators to healthy eating during their adaption to life in Finland.

METHODS

We used a mixed-METHODS design, comprising a cross-sectional online survey (using validated tools such as FFQs, CEBQ, HFIAS, CATS Trauma Screen, and Academic Self-Efficacy and Resilience scales) and focus group interviews (N=28; 16 mothers, 12 children). We used Atlas software to analysis qualitative data. In January 2025, we surveyed 100 school children (grades 1–9) and 88 caregivers across 12 Finnish regions with the assistance of the Ukrainian Association in Finland. Participants were Ukrainian refugees who arrived post-invasion, lived in Finland > 1 month, with school-aged child (grades 1–9). Data are compared between children who remained in Ukraine and those resettled in Finland.

RESULTS

Focus groups revealed unfamiliar local foods, stress-eating, fussiness, and skipping school meals as major barriers, whereas free access to school lunches and community support were identified as facilitators. Stress and anxiety were frequently reported among children after relocation. After relocating to Finland, 90% of children experienced at least one parent-reported EB change, significantly higher than in Ukraine ($p < 0.001$). School meals attendance covered 82.8% of Ukrainian children who regularly eat school lunch. Although, 12.5% skipped school lunch on 1-2 days, and 4.7% skipped school lunch on 3-5 days due to unfamiliar foods and taste preferences.

CONCLUSIONS

Preliminary findings point to war exposure and acculturation challenges as major determinants of Ukrainian children's eating patterns. High school meals attendance might be a partial protective factor potentially mitigating war-related disruptions to eating patterns while supporting wellbeing and integration. Further research should examine how the war trauma and distress relates to dietary changes, informing targeted public health strategies and community interventions to promote healthy eating and well-being among displaced children.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP15_09

FOOD PROCESSING AND ORAL AND PHARYNX- AND GASTROINTESTINAL- CANCER RELATED MORTALITY IN A LARGE-SCALE EUROPEAN COHORT

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BACKGROUND AND OBJECTIVES

Ultra-processed food (UPF) consumption has been associated with various cancer types and overall mortality, however research on cancer mortality considering subtypes is scarce. This multi-centre study investigated associations between food intake by degree of processing using the Nova classification and risk of oral and pharynx and gastrointestinal cancer mortality in Europe.

METHODS

This study involved participants from the European Prospective Investigation into Cancer and Nutrition from Denmark, France, Germany, Italy, the Netherlands, Spain, and the United Kingdom. We investigated the following mortality outcomes: oral and pharynx cancer and, for gastrointestinal cancer, digestive cancer, liver and pancreas cancer, and colorectal cancer. Hazard ratios (HRs) and 95% CIs were estimated using multivariable Cox proportional hazards regression models. We also performed substitution analyses.

RESULTS

A total of 348,890 (71·2% female) participants were included in the analysis. UPF consumption (in grams per day [g/d]) was positively associated with oral- and pharynx- cancer mortality (HRs per 1-SD: 1·24; 95% CI: 1·03,1·48), as well as mortality from gastrointestinal cancer (1·06; 95% CI: 1·01,1·11), and, more in particular, colorectal cancer (1·11; 95% CI: 1·03,1·2). RESULTS were still significant for oral and pharynx cancer- and colorectal cancer- mortality when removing alcohol from the Nova classification (1·23; 95% CI: 1·02,1·49 and 1·1; 95% CI: 1·02,1·2, respectively). Replacing processed and UPFs with unprocessed/minimally processed was inversely associated with mortality from oral and pharynx cancer- and colorectal cancer- mortality.

CONCLUSIONS

In this pan-European analysis, higher UPF consumption was associated with a greater risk for oral and pharynx cancer- and colorectal cancer- mortality. Promoting the consumption of unprocessed/minimally processed foods while discouraging highly processed foods in dietary recommendations may be beneficial for public health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 19 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP19_02

THE COMMUNITY-UP FOOD BOOST CHALLENGE APPROACH: IN WHICH ADOLESCENTS AND FOOD SYSTEM PARTNERS SEARCH FOR LEVERAGE POINTS TO CHANGE THE FOOD SYSTEM

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BACKGROUND AND OBJECTIVES

To nurture a healthy next generation, it is essential that food policies are effective. However, there is a significant gap between these policies and the real-world food experiences, behaviors, and environments of adolescents. To address this gap, the Food Boost Challenge (FBC) approach has been developed. Here, we assessed its potential to identify feasible, accessible, affordable and endurable solutions.

METHODS

The FBC utilizes a community-based participatory action research approach, structured across five phases: (1) situational problem analysis through peer research, (2) idea generation, (3) co-creation and prototyping, (4) prototype testing and dissemination, and (5) implementation at pilot scale. Adolescents and food system partners, throughout the quadruple helix, work collaboratively through these phases to identify barriers and develop innovative ideas, concepts and prototypes and pilot test them in practice.

RESULTS

To date, 10 FBCs have been conducted in The Netherlands, addressing wicked food problems of adolescents such as: increasing the consumption of vegetables and fruit; making the healthy food choice the easy choice at hotspots where large numbers of adolescents gather (such as festivals and sports events); promoting a healthy, sustainable diet. These FBCs ranged from one-day events (n=5) for vocational scholars (n=800) and hospitality university students (n=400); to 6-week events (n=2) for vocational scholars (n=60); to 9-month events (n=3) in which 250 university students participated in phase 1 and 28 teams of adolescents (n=150) together with >50 food system partners - including educators, researchers, governemental, non-governmental and industry stakeholders. So far, this resulted in insights into drivers and barriers of >2000 adolescents; generation of 45 ideas; 28 prototypes being tested in >1500 adolescents; 15 winning pitches according to expert and popular voting (by >4500 voters); and >5 implementation projects. The RESULTS further indicate positive effects, such as changes in adolescents' attitudes toward healthy eating, skill development among students, and increased collaboration among stakeholders.

CONCLUSIONS

In conclusion, the FBC fostered creative solutions for healthy food choices, community building and created a collaborative framework that extends its impact beyond adolescent health to broader social impact and community transformation. This highlights that the search for leverage points to change the food system creates space for lasting improvements in adolescent nutrition and public health taking into account both policy and everyday reality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP19_04

ASSOCIATION BETWEEN SEAFOOD, EPA, DHA CONSUMPTION AT EACH MEALTIME AND CHRONOTYPE/SOCIAL JETLAG IN SLEEP

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BACKGROUND AND OBJECTIVES

Seafood, rich in omega-3 fatty acids like EPA / DHA, has been reported to be related to sleep, and animal studies have also revealed that EPA /DHA influence the circadian clock. Social jet lag refers to the differences of the sleep phases between weekdays and weekends, often seen in the evening rather than the morning chronotype. The impact of the timing of seafood consumption on the sleep phase in humans remains unclear. Therefore, this cross-sectional study aimed to examine the relationship between seafood, EPA, and DHA intake in each mealtime and sleep patterns among Japanese individuals.

METHODS

Dietary and sleep data from 5,975 adults (aged 18–75 years) were analyzed. Multiple regression analysis assessed associations between seafood, EPA, and DHA intake at different mealtimes (breakfast, lunch, dinner, snacks) measured by the mobile food-log App. A chronotype was determined by midpoint of bedtime and wake-up time on weekend, and social jet lag by differences of midpoints on weekday and weekend. Adjustments were made for age, sex, BMI, annual income, total energy intake, and physical activity.

RESULTS

Individuals with a morning chronotype consumed significantly more seafood, EPA, and DHA at breakfast, lunch, and dinner, but less from snacks, compared to evening chronotypes. Higher daily intake of seafood, EPA, and DHA was associated with a morning chronotype and reduced social jet lag. Additionally, seafood, EPA, and DHA intake at breakfast and lunch were linked to earlier sleep patterns, with breakfast intake showing the strongest association.

CONCLUSIONS

Higher daily intake of seafood, EPA, and DHA was found to be associated with morning chronotype and less social jet lag, particularly consumption at breakfast and lunch.

CONFLICTS OF INTERESTS
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OAP19_05

ADOLESCENT NUTRITION IN BANGLADESH: EXAMINING REGIONAL DIFFERENCES IN DIETARY DIVERSITY AND NUTRITIONAL STATUS

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BACKGROUND AND OBJECTIVES

Adolescent girls are highly susceptible to undernutrition due to poor dietary diversity and low intake of micronutrient-rich foods. Those living in coastal and non-coastal areas of Bangladesh face unique risks of undernutrition, exacerbated by geographical and environmental factors like flooding, salinity, and drought, worsened by climate change. This study aims to explore the differences in dietary diversity and undernutrition among adolescent girls in these regions.

METHODS

Two cross-sectional surveys were conducted in the southern coastal and northern non-coastal regions of Bangladesh, selecting 400 girls from coastal and 420 girls from non-coastal areas, aged 10–19 years, using multistage cluster sampling technique. Data on socio-demographics and dietary intake were collected, and anaemia was measured using haemoglobin concentration in blood capillaries with a Hemocue-301 machine. Multiple logistic regression was used to identify factors associated with anaemia and underweight.

RESULTS

In the coastal area, girls were older, with 60% aged 15-19 years, while non-coastal girls were younger, with 65% aged 10-14 years. Educational attainment was higher among coastal girls (93.7% had secondary or higher education) compared to non-coastal girls (51.4%). Dietary diversity was low in both regions, with over 75% of girls consuming fewer than five food groups. Animal protein intake was higher among non-coastal girls (76.9%) compared to coastal girls (60.8%). The prevalence of underweight was almost similar between regions (30.6% in coastal and 34.3% in non-coastal areas), and anaemia affected about 38% of girls in both areas. In non-coastal regions, non-Muslim individuals had higher odds of anaemia compared to Muslims (AOR: 2.15, 95% CI: 1.35-3.41), and media exposure was associated with significantly lower odds of anaemia (AOR: 0.56, 95% CI: 0.37-0.83). Additionally, consuming five or more food groups was associated with nearly double the odds of being underweight (AOR: 1.99, 95% CI: 1.11-3.56). In coastal regions, girls aged 15 to 19 had higher odds of being underweight compared to those aged 10 to 14 (AOR: 2.06, 95% CI: 1.48-2.89). Improved toilet facilities were associated with a reduction in the odds of being underweight (AOR: 0.62, 95% CI: 0.41-0.94).

CONCLUSIONS

Adolescent girls in coastal and non-coastal Bangladesh face critical challenges with dietary diversity and undernutrition. Targeted interventions, including media campaigns and improved access to nutrition and sanitation, are crucial to mitigate these issues.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP19_07

ORAL ADMINISTRATION OF HEAT-KILLED LACTICASEIBACILLUS PARACASEI INHIBITS THE IN VIVO GROWTH OF ORAL SQUAMOUS CELL CARCINOMA THROUGH TARGETING CANCER STEM CELLS

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BACKGROUND AND OBJECTIVES

Cancer stem cells (CSCs) are the source of cancer initiation, relapse, drug resistance, and metastasis. While targeting CSCs is a potential therapeutic strategy, probiotics have recently shown anti-cancer properties. This study investigates the anti-oral cancer potential of heat-killed (HK) *Lacticaseibacillus paracasei* strain GMNL-346.

METHODS

The effects of HK-GMNL-346 were evaluated on SAS and HSC3 oral cancer cell lines and a normal gingival epithelial cell line. Cell proliferation, cell cycle analysis, and tumorsphere formation were assessed. In vivo studies used SAS tumor-bearing nude mice to evaluate survival time and tumor markers. Metagenomic sequencing of intestinal tissues and short-chain fatty acid analysis of cecum contents were performed to investigate underlying mechanisms.

RESULTS

HK-GMNL-346 selectively inhibited oral cancer cell proliferation while sparing normal cells. It interrupted cell cycle progression with increased pRB and p16INK4a expression and suppressed tumorsphere formation with decreased cancer stemness gene expression, including BMI1, SOX2, and OCT4. In vivo, HK-GMNL-346 extended survival time in tumor-bearing mice and reduced tumor weights. It also modulated Ki-67 and RB expression in tumor tissues. Metagenomic analysis of gut microbiota revealed negative and positive correlations between tumor weight and *Lactobacillus spp*. and *Bacteroides spp*., respectively. HK-GMNL-346 treatment restored tumor-induced decreases in propanoic and isobutyric acid levels.

CONCLUSIONS

Heat-killed *L. paracasei* GMNL-346 demonstrates anti-CSC activity in oral cancer, suggesting its potential development as an adjuvant therapeutic agent.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP19_08

AN ASSESSMENT OF THE NUTRITIONAL COMPOSITION AND ON-PACKAGED MARKETING OF COMMERCIALLY PRODUCED COMPLEMENTARY FOODS IN SUB-SAHARAN AFRICA

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BACKGROUND AND OBJECTIVES

Optimal nutrition during the first 1000 days is essential for growth and development, as well as for the prevention of childhood overweight and obesity. However, appropriate, whole complementary foods are becoming displaced by the increasing popularity of commercially produced complementary foods (CPCF). These CPCF are frequently high in nutrients of concern, such as sugar, saturated fats and sodium, while providing excess calories, but are marketed to caregivers through misleading labelling. This study aimed to investigate the nutritional composition and on-package marketing of CPCF in Sub-Saharan Africa.

METHODS

A quantitative study design was used to conduct a secondary analysis of 452 CPCF available in four Sub-Saharan African countries (Kenya, South Africa, Tanzania and Zimbabwe). Compliance with on-package marketing and health claims articles of The International Code of Marketing of Breastmilk Substitutes (The Code) was assessed using a standardised questionnaire. The nutritional composition of CPCF was evaluated against the WHO's Nutrient and Promotion Profile Model (NPPM). Although not legally required, the NPPM provides a means of assessing the nutritional adequacy and appropriate labelling of CPCF.

RESULTS

Nutrition and health claims were frequently used ($\bar{x}$ = 4.7 claims per product) on product packages in the study sample. Adherence to The Code was low with adherence with the prohibition of the promotion of bottle feeding at 48%. Adherence to required statements on the importance of breastfeeding for up to two years and beyond, and the importance of avoiding early introduction of complementary foods was even lower at 16% and 13%, respectively. In terms of nutrient content and front-of-pack labelling compliance with the NPPM, overall compliance was low, at 29%. Lowest compliance was seen for energy and sugar (36.8% and 54.4% non-compliance, respectively). Of the sample, none (0%) were compliant with all the marketing and labelling requirements of the NPPM.

CONCLUSIONS

The nutritional quality and marketing of CPCF is inappropriate in Sub-Saharan Africa. The findings of this study underscore the urgent need for stronger and effectively enforced regulations regarding the marketing and nutritional quality of CPCF in Sub-Saharan Africa. Such regulations could include banning all claims on CPCF; limiting nutrients of concern; developing a region or country-specific NPPM for CPCF; and enhancing compliance to The Code. By implementing improved policy recommendations, governments can better protect and support children during the critical 1000-day window, ensuring a better start in life.

CONFLICTS OF INTERESTS

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OAP 22 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP22_01

ADHERENCE TO THE DIETARY APPROACHES TO STOP HYPERTENSION (DASH) IS ASSOCIATED WITH LOWER PRESENCE COGNITIVE IMPAIRMENT IN ELDERLY: THE MEDIATING EFFECT OF SUSTAINABLE CONSUMPTION BEHAVIORS

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BACKGROUND AND OBJECTIVES

Sustainable and healthy nutrition models are known to have an important role in the prevention or improvement of cognitive impairment in elderly individuals. However, there is limited research examining the relationship of sustainable consumption behavior on cognitive impairment as well as physically intake of food in an increasing elderly population. This study investigated the mediating role of sustainable consumption behavior-nutrition (SCBN) in the relationship between DASH quailty and cognitive impairment.

METHODS

The cross-sectional study included 890 individuals over the age of 60 years admitted to the geriatrics clinic of two private hospitals in Turkey. Participants completed a questionnaire including a Mini-Mental State Examination (MMSE) test, DASH diet score (DASH-DS), SCBN scale and a demographic information form. Hierarchical regression analyses were conducted to determine the effects of independent variables on cognitive impairment. SEM analysis was performed to reveal the mediating role of SCBN. In addition, the moderating role of potential variables like age, gender, education, BMI and chronic disease were examined in SEM analysis.

RESULTS

Whilst 66.3% of the participants were at risk of mild cognitive impairment, individuals with lower income and education level, sedentary, higher age and BMI were associated with high risk of cognitive impairment. Based on hierarchical regression analysis, DASH-DS, purchasing choice (PC) and nutritional choice (NC), which are the sub-dimensions of SCBN, were found to favourably affect cognitive impairment status [β (95% CI)= 0.34 (0.31-0.37); 0.77(0.46-1.08); 0.49(0.21-0.75) and respectively] and the explanation rate of this effect was found to be 13.9%. It was found that purchase choice mediated the relationship between DASH-DS and MMSE scores [Indirect effect β (95% CI)= -0.047 (-0.21-(-0.69)), $p<0.01$]. Furthermore, performing subgroup analyses, the mediating effect of PC was sustained for both gender groups, individuals older than 75 years and sedentary individuals. NC were not found to mediate the relationship between DASH-DS and MMSE scores.

CONCLUSIONS

DASH, a sustainable and healthy diet model, was shown to provide favourable effects on cognitive impairment by motivating the formation of sustainable consumption behaviour. In the elderly, adopting sustainable food consumption behaviour patterns that include not only physical consumption of healthy food but also preventing food waste, preferring fresh, seasonal, local, organic foods and fair-trade products may improve cognitive impairment.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP22_02

IDENTIFYING GAPS AND OPPORTUNITIES FOR IMPROVEMENT IN NUTRITIONAL AND DIETARY GUIDELINE COMPLIANCE IN CANADIAN LONG-TERM CARE MENUS

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BACKGROUND AND OBJECTIVES

Nutritional adequacy and food quality are critical in long-term care (LTC) settings to support the health, well-being, and quality of life of older adults. However, many LTC menus fail to meet dietary guidelines, not only in nutrient composition but also in the quality and variety of foods offered. This study aims to evaluate non-compliant LTC menus compared to compliant counterparts, identifying differences in nutrient intake, food quality, and diversity across food groups, with a focus on understanding how these menus meet or fall short of Dietary Reference Intake (DRI) and 2019 Canada's food guide (CFG) standards.

METHODS

Using a 4-week menu cycle with 1,365 items, 10,000 daily LTC menus were generated and evaluated against DRI and 2019 CFG compliance criteria. Non-compliant menus (e.g., those not meeting nutrient and food guide benchmarks) were analyzed to identify prevalent nutrient shortfalls, over-reliance on specific food categories, and barriers to incorporating nutrient-dense foods. Food categories were determined using the Healthy Eating Food Index-2019 (HEFI-2019). Mean values and standard deviations (SD) were calculated for key macronutrients and essential vitamins and minerals. The average percent difference between dietary targets and compliant menus was reported. A Welch Two Sample t-test was conducted to compare the mean values of non-compliant and compliant menus.

RESULTS

Non-compliant menus (n=9,999) exceeded energy and sodium targets by 29.7% and 18.7%, respectively, while protein and fiber fell short by 8.1% and 19.8% (all $p<0.001$). Key micronutrients, including calcium, vitamins C, A, and D, were significantly below target levels (all $p<0.001$). Food component analysis showed deficiencies in fruits and vegetables (-23.5%) and whole grains (-65.9%), alongside excessive inclusion of non-whole grains (66.7%) and animal-based proteins (80.0%) (all $p<0.001$). Discretionary "other foods" exceeded targets by 181.3% ($p<0.001$), indicating a reliance on calorie-dense, nutrient-poor items.

CONCLUSIONS

Non-compliant LTC menus showed significant gaps, including excess energy, sodium, and discretionary foods, alongside shortfalls in fibre, essential vitamins, minerals, fruits, vegetables, and whole grains. Addressing these gaps could improve menu quality and better align with dietary guidelines, supporting the health of LTC residents.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP22_03

Pasifika Youth Diet Study: A mixed METHODS study on the dietary intake and experience of food environment for Pasifika Adolescents in Australia

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BACKGROUND AND OBJECTIVES

Pasifika communities in Australia experience disproportionately high rates of obesity and type 2 diabetes (1), with dietary behaviour identified as a significant risk factor. Pasifika adolescents are 4–5 times more likely to be obese compared to the general Australian adolescent, with outdated data from 2006 indicating a prevalence of 49.1% for those aged 12–18 years (2). Adolescence is a critical period for establishing dietary behaviours that persist into adulthood and influence long-term health outcomes (3-4). Given limited research in this area, this study aims to investigate the dietary behaviours and food environment experiences of Pasifika adolescents to inform culturally tailored health strategies.

METHODS

This mixed-METHODS study recruited Pasifika adolescent (12-17 years) participants using respondent-driven sampling and network-based recruitment. Dietary intake was assessed through two non-consecutive dietitian-administered 24-hour recalls, with intake data was averaged to estimate usual intake (5). A subgroup participated in 'talanoa'-style focus groups (6) or semi-structured interviews, incorporating a photovoice element, to explore their experiences with the local food environment.

RESULTS

A total of 108 Pasifika adolescents participated, with 100 completing both recalls (mean age: 14.9±1.7 years; 37% female; 29% Melanesian, 71% Polynesian). Median energy intake was 13,083 kJ/day (IQR: 10,676–17,949), with 13.6% from saturated fat and 14.4% from added sugars. Participants consumed 2.4 sugar-sweetened beverages daily. According to Australian Dietary Guidelines, 77% met recommendations for serves of grains (median: 9.5 serves/day, IQR: 6.9-12.6, 92% refined), 23% met both fruit and vegetable (fruit: 1.6 serves/day, 1.1-3.1; vegetables: 4.5 serves/day, 3.0-7.5, 93% starchy), 63% met protein foods (3.3 serves/day, 2.1-4.8, 29% processed meats), and 7% met dairy foods (1.5 serves/day, 0.9-2.4). Qualitative data (n=17) highlighted barriers of low accessibility and availability of healthy foods, high cost and low convenience of healthy eating behaviours, saturated fast-food advertising, and low desirability of healthy foods. Households, often extending beyond the nuclear family, and church communities strongly influenced adolescents' food choices.

CONCLUSIONS

This study reveals suboptimal dietary behaviours among Pasifika adolescents in Australia, driven by an obesogenic food environment. Culturally tailored interventions within household and church settings may address these challenges and improve dietary behaviours, reducing the risk of chronic conditions in this community.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP22_04

ASSESSMENT OF FACTORS AFFECTING PERCEIVED AND ACTUAL CARBOHYDRATE PORTION SIZES AMONG AN ADULT POPULATION IN ACCRA

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BACKGROUND AND OBJECTIVES

Portion size perception plays a critical role in dietary assessments and nutrition interventions, particularly in mitigating risks associated with overconsumption and obesity. Misjudging portion sizes of carbohydrate-rich foods, influenced by factors like age, gender and BMI, can undermine dietary counseling and intervention strategies. This study aimed to assess the relationship between these demographic factors and the perception and actual serving sizes of selected carbohydrate foods among adults in Accra.

METHODS

This cross-sectional study included adults (≥18 years) selected from four income zones in Greater Accra. Participants identified and served their perceived portion sizes of 12 common carbohydrate foods using standardised handy measures. Sociodemographic data and anthropometric measurements (height, weight, BMI) were recorded. Relationships between perceived and actual portion sizes and their associations with age, gender and BMI were analysed using paired t-tests and Pearson's correlation.

RESULTS

Preliminary findings indicate significant discrepancies between perceived and actual serving sizes with trends varying by age, gender and BMI. Notably, Overweight and obese individuals showed a tendency to underestimate portion sizes, while middle-aged women demonstrated better portion estimation accuracy and males were better able to perceive portion sizes correctly than females.

CONCLUSIONS

This study underscores the importance of personalised dietary interventions that address demographic-specific biases in portion size perception. These findings have implications for improving nutrition counseling practices and formulating public health strategies to combat obesity and other non-communicable diseases.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP22_05

VITAMIN D SUPPLEMENTATION AND DOSE RESPONSE IN WOMEN OF REPRODUCTIVE AGE AND PREGNANT WOMEN IN TWO DOUBLE-BLIND, RANDOMIZED, CONTROLLED MICRONUTRIENT DOSE RESPONSE (MINDR) TRIALS IN RURAL BANGLADESH

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BACKGROUND AND OBJECTIVES

Antenatal multiple micronutrient supplements (MMS) with recommended levels of 15 nutrients improve pregnancy outcomes but may not eliminate micronutrient deficiencies. Vitamin D status is compromised in settings with poor diet and limited sunlight exposure. We report on two ongoing bioefficacy trials of micronutrient supplementation with increasing amounts of vitamin D along with other micronutrients, in women of reproductive age (WRA) and pregnant women (PW) aged 18-35 years in rural northern Bangladesh, to determine the amounts of each nutrient that minimizes deficiency. This abstract focuses on Vitamin D.

METHODS

The trials are double-blind, placebo-controlled, and randomized, with 240 PW and WRA (60 per arm) in each (NCT06081114). Daily doses of micronutrients are provided in a reconstituted powdered drink, including a placebo, with a balanced energy-protein product containing ~1 recommended dietary allowance (RDA) of 18 micronutrients/serving. Vitamin D doses are 600, 1400, 2200, and 3000 IU/day per arm, ~1-5 times the RDA, and up to 75% of the tolerable upper intake level. Trial duration is 3 months for WRA and ~6 months in PW (12-16 weeks gestation to birth), with biospecimens collected at baseline, midpoint, at/near the end of supplementation, and at 1 month postpartum for PW. Serum 25-hydroxy vitamin D [25(OH)D] is measured by autoanalyzer (Roche Diagnostics). Serum calcium will be measured by mass spectrometry (7850 ICP-MS; Agilent) to ensure the absence of hypercalcemia, associated with vitamin D excess. Pharmacokinetic (PK) and pharmacodynamic (PD) analytical approaches will be applied to ascertain the threshold of intake at which vitamin D sufficiency is attained without any evidence of excess.

RESULTS

In total, 289 WRA and 354 PW were enrolled, with follow-ups ending in December 2024 and April 2025, respectively. The study arms were comparable in terms of baseline characteristics. Preliminary blinded data on baseline vitamin D status shows that among WRA (n=281) and PW (n=337), 49.8% and 58.2% were vitamin D insufficient (30 to <50 nmol/L) and 4.3% and 6.2% deficient (<30 nmol/L), respectively. PK and PD RESULTS for the complete dataset will be presented by baseline status at the conference.

CONCLUSIONS

Vitamin D insufficiency is high among WRA and PW in Bangladesh. Findings from the dose-response trials will inform vitamin D dosing in MMS products for settings with a high risk of vitamin D deficiency.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP22_06

SCREEN USE DURING PREGNANCY: ITS EFFECTS ON CHRONOTYPE, NIGHT EATING HABITS, AND SLEEP QUALITY AT THIRD TRIMESTER

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BACKGROUND AND OBJECTIVES

Increased screen usage has highlighted potential risks of disturbed sleep and erratic eating behaviours. Pregnant women are vulnerable to environmental exposures, as changes in maternal lifestyle behaviours significantly influence pregnancy outcomes. Hence, this study aims to determine the associations of screen time with chronotype, chrononutrition habits, and sleep quality among pregnant women.

METHODS

This prospective cohort study recruited 143 pregnant women at the third trimester from nine randomly selected government maternal and child health clinics in Kuala Lumpur, Malaysia. Screen time, chronotype, chrononutrition habits, and sleep quality were assessed using the Screen Time Questionnaire (STQ), Morningness-Eveningness Questionnaire (MEQ), Chrononutrition Profile Questionnaire-Pregnancy (CPQ-P), and Pittsburgh Sleep Quality Index (PSQI) respectively.

RESULTS

The average smartphone screen use on weekdays was 10.09±5.02 hours, while weekend was 10.04±4.89 hours. Background screen use was 2.24±3.32 hours on weekdays, and 2.60±3.46 hours on weekends. On weeknights, smartphone screen use was 3.33±1.73 hours, while background screen use was 1.19±1.73 hours. Pregnant womens' chronotype were mainly with intermediate (60%), followed by morningness (34%), and 6% eveningness. There were 12.5% who had breakfast skipping habits and 81.5% had night snacking habits. The mean global PSQI score was 6.17±3.40, with 60% of pregnant women experiencing poor sleep quality.

Generalized estimating equations showed an association of smartphone screen use during weekdays on increased night eating habits (B=0.049, p=0.017). On weeknights, increased background screen use had a significant effect on poor sleep quality (B=0.143, p=0.005). Pregnant women with increased smartphone screen use during weekends were found to have later chronotype (B=-0.439, p=0.001).

CONCLUSIONS

Pregnant women with increased screen use tend to have later chronotypes, increased night eating habits, and experience poor sleep quality. Future studies are warranted to determine the implications of prolonged maternal screen time with birth outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP22_07

BALANCED ENERGY PROTEIN SUPPLEMENTATION IN PREGNANCY AND MATERNAL MORBIDITY AND BLOOD PRESSURE IN A CLUSTER RANDOMIZED CONTROLLED TRIAL IN RURAL BANGLADESH

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BACKGROUND AND OBJECTIVES

In South Asia, pregnancy related morbidities including weakness, nausea, vomiting, breathlessness, fever, lower abdominal pain and vaginal discharge are common and associated with adverse pregnancy outcomes. Hypertension during pregnancy is associated with risk of pre-eclampsia/eclampsia and maternal death. Multiple micronutrient supplements (MMS) reduces adverse birth outcomes and calcium reduces the risk of hypertension. However, evidence is lacking on the effects of fortified balanced energy protein (BEP) supplementation on pregnancy-related morbidities and hypertension. Our aim is to evaluate the effect of targeted and untargeted fortified BEP supplementation (containing 15 micronutrients at an RDA for pregnancy and 500 mg of calcium) versus multiple micronutrient supplements (MMS using the UNIMMAP formulation) as control in pregnancy, on morbidity and hypertension.

METHODS

The ongoing TARGET-BEP study is a four-arm cluster randomized trial that enrolled 3,390 pregnant women who were assigned to receive: MMS (Arm 1 control); BEP (Arm 2); BEP if low pre-pregnancy BMI (<18.5 kg/m²), or MMS otherwise (Arm 3); or BEP if low pre-pregnancy BMI, MMS for others and BEP if found to have inadequate gestational weight gain (Arm 4). 30-day morbidity recalls were collected at enrollment (9.9 weeks) and in the third trimester (~32 weeks gestation). Blood pressure was measured 7 times between 20 weeks gestation and birth outcome. Prevalence rates of morbidities and high blood pressure (systolic:>140 diastolic:>90 mmHg) will be compared using log-binomial regression models with generalized estimating equations to adjust for the cluster design.

RESULTS

Baseline characteristics including maternal age, parity, and nutritional status did not differ between groups. The prevalence of nausea, vomiting, low grade fever and lower abdominal pain at enrollment was 67.1%, 40.3%, 31.8% and 16.6%, respectively. The mean systolic and diastolic blood pressure was 101.3 (9.2) mmHg and 62.7 (7.1) mmHg, respectively, with less than 1% hypertensive at baseline (Table 1). Effects of targeted and untargeted BEP versus MMS in pregnancy on these outcomes will be presented.

CONCLUSIONS

RESULTS of this study will inform whether targeted and untargeted fortified BEP supplementation in pregnancy reduces the risk of pregnancy-related morbidities and hypertension among pregnant women in rural Bangladesh.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP22_09

LONGITUDINAL TRENDS IN ULTRA-PROCESSED FOOD CONSUMPTION ACROSS EATING OCCASIONS IN CHILEAN CHILDREN AND ADOLESCENTS

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BACKGROUND AND OBJECTIVES

Ultra-processed foods (UPFs), traditionally represented by products such as confectionery, soft drinks, and salty snacks, have expanded in variety and availability, potentially displacing traditional foods during meals (1). This study aimed to analyze trends in UPF consumption during meal and snack occasions among Chilean children and adolescents over a seven-year period.

METHODS

We analyzed longitudinal data from 872 children and 841 adolescents (mean age at baseline: 4.9±0.5 and 13.8±0.4 years, respectively), with at least two dietary assessments collected annually between 2016 and 2023 (average number of measures: 4.5 for children and 3.2 for adolescents). Food consumption was recorded using 24-hour dietary recalls (2), and foods and beverages were classified according to the NOVA food system (3). Eating occasions were categorized as meals (breakfast, lunch, dinner) and snacks (snack, teatime, beverage break) based on participant reports (mothers reported for children). We assessed changes in the contribution of UPF and the proportion and amounts of UPF consumed during meals over time using mixed linear regression models adjusted for sex, age in months, parental education, nutritional status, and total caloric intake. Given the longitudinal nature of the study and the growth of participants, we used margins to perform descriptive analyses, presenting adjusted means for UPF consumption considering the covariates.

RESULTS

The adjusted mean caloric proportion of UPF decreased in children, from 49.2% in 2016 to 40.2% in 2023 (p-trend<0.001), but remained stable in adolescents (42.7% in 2016 to 41.7% in 2022, p-trend=0.531). Among children, this decrease was attributed to reduced UPF intake during snacks (from 384 to 314 g, p<0.001; from 503 to 402 kcal, p<0.001) with stable UPF consumption in meals (p>0.05). Conversely, in adolescents, we observed a reduction in calories, though not in grams, of UPF during snacks (566 to 509kcal; p=0.005; 406 to 432g, p=0.249) and an increase in UPF consumption during main meals (282 to 339kcal; p<0.001; 300 to 413g, p<0.001).

CONCLUSIONS

While the decrease in ultra-processed food consumption as snacks is promising, the observed increase in UPF consumption during mealtimes among adolescents raises concerns and warrants further investigation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 23 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP23_01

CONSUMPTION OF ORGANIC FOODS DURING PREGNANCY AND NEURODEVELOPMENTAL SCORES UP TO 6 YEARS IN A FRENCH BIRTH COHORT

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BACKGROUND AND OBJECTIVES

Consumption of organic foods may limit exposure to neurotoxic pesticides. The objective of this work was to analyse the relationship between the consumption of organic foods during pregnancy and infancy and child cognitive development up to 6 years of age.

METHODS

Analyses included 12,098 children from a French nationwide birth cohort. The consumption of organic foods was assessed through a single item reporting the frequency of from “never” to “always or almost always”, retrospectively at delivery for the pregnancy period, and monthly during the infant complementary feeding period. Child cognitive development was assessed using the Child Development Inventory (CDI) at 1, 3.5, and 5.5 years; the MacArthur-Bates Communicative Development Inventory at 2 years; and the Picture Similarities test from the British Ability Scale at 3.5 years. School performance, considering math and reading dimensions, was evaluated at 4 and 6 years. Associations between organic food consumption and neurodevelopmental scores were evaluated using linear or logistic regressions, adjusting for main confounders, including maternal socioeconomic status, migration, depression, parity, diet quality, and learning difficulties during childhood.

RESULTS

The consumption of organic foods during pregnancy was positively associated with CDI scores at 1 and 3.5 years, negatively with the risk of developmental delay at 5.5 years, positively with language at 2 years and reading performance at 4 and 6 years. RESULTS remained similar after adjusting for breastfeeding. Findings were less consistent when organic foods during complementary feeding was considered, mainly for the positive association for the reading performances at 4 and 6 years which was not statistically significant anymore.

CONCLUSIONS

These RESULTS suggest that frequent consumption of organic food during pregnancy, rather than during complementary feeding, may be beneficial for cognitive development, independent of maternal diet quality. Further studies are needed to confirm these findings and should use more detailed exposure level of organic food consumption.

CONFLICTS OF INTERESTS

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OAP23_03

BALANCED ENERGY PROTEIN SUPPLEMENTATION IN PREGNANCY AND HEMOGLOBIN AND ANEMIA IN THE THIRD TRIMESTER IN A CLUSTER RANDOMIZED CONTROLLED TRIAL IN RURAL BANGLADESH

Kaniz Ayesha Fahmida[1]; Hasmot Ali,[1]; Eleonor Zavala,[2]; Andrew Thorne-Lyman[2]; Rezwanul Haque[1]; Lee Shu Fune Wu[2]; Hasan Mahmud Sujan[1]; Shahnaz Parvin[1]; Towfida Siddiqua[1]; Diwakar Mohan[2]; Daniel Erchick,[2]; Parul Christian[2]
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BACKGROUND AND OBJECTIVES

Anemia in pregnancy remains a public health challenge in low-resource countries like Bangladesh, contributing to adverse maternal and neonatal outcomes. Fortified balanced energy protein (BEP) supplementation, which combines daily multiple micronutrients (MMS) with additional energy (~400 kcal) and protein (~15g), has been identified as a potential strategy for improving maternal nutrition and birth outcomes. Our aim is to evaluate the effect of fortified BEP, with and without targeting, compared to MMS as control using the UNIMMAP formulation (both containing 30 mg of iron), on hemoglobin (Hb) level and anemia prevalence among pregnant women in rural Bangladesh, in a cluster-randomized controlled trial assessing the effects of BEP targeting strategies on birth outcomes.

METHODS

The TARGET-BEP study is a cluster randomized controlled trial is ongoing in rural northwestern Bangladesh. Married women of reproductive age 15-35 years underwent monthly pregnancy surveillance and were enrolled in the study at 12-14 weeks gestation. Based on their cluster allocation, they were assigned to the following supplementation groups: MMS (control, arm-1); BEP (arm-2); BEP for women with pre-pregnancy body mass index (BMI) <18.5 kg/m2 and MMS for others (arm-3); BEP for women with pre-pregnancy BMI<18.5 kg/m2 and inadequate gestational weight gain switched to BEP from MMS and MMS for others (arm-4). Hb level was measured at enrollment and in late pregnancy by trained workers using capillary blood draw and HemoCue Hb-301 machine. Anemia was defined as Hb<110 g/L. Continuous Hb level will be analyzed using linear regression and prevalence of anemia will be analyzed using log-binomial regression, both with generalized estimating equations to adjust for the trial design in comparing the intervention groups to the control group.

RESULTS

A total of 3390 pregnancies were enrolled in the trial from October, 2022 to August, 2024. Baseline characteristics including maternal age, parity, and nutritional status did not differ by groups. The mean (SD) gestational age at enrollment was 9.9 (3.6) weeks. At enrollment the mean (SD) Hb concentration was 116 (11.7) g/L and 27.4% were anemic with no differences by arm. Effects of targeted and untargeted BEP compared to MMS in pregnancy on anemia in late pregnancy will be presented.

CONCLUSIONS

RESULTS will inform if targeted and untargeted fortified BEP supplementation compared to MMS reduces the risk of third trimester anemia among pregnant women in rural Bangladesh.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP23_04

IMPACT OF MATERNAL NUTRITIONAL INTERVENTIONS ON HUMAN MILK COMPOSITION: INSIGHTS FROM THE IMIC CONSORTIUM FROM BURKINA FASO, PAKISTAN AND TANZANIA

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BACKGROUND AND OBJECTIVES

Despite the critical importance of human milk (HM) for infant health and development, little is known about how maternal nutritional interventions affect its composition. The International Milk Composition (IMiC) Consortium analyzed HM samples from three randomized controlled trials testing different nutritional interventions: balanced energy-protein supplementation (BEP) during pregnancy and/or lactation in Burkina Faso (MISAME-III) and Pakistan (VITAL-LW), and nicotinamide supplementation during lactation in Tanzania (ELICIT). VITAL-LW and ELICIT included antibiotic interventions. The CHILD cohort (Canada), which did not involve any intervention, served as a reference for comparison.

Objective: To present findings on the impact of maternal nutritional interventions on HM composition across diverse settings and stages of lactation, and across a range of milk -omic measures.

METHODS

Data were analyzed to assess the effects of nutritional interventions on individual and combined measures of HM composition from the three IMiC inbterventional trials trials. These include macronutrients (fat, protein, carbohydraites), micronutrients (vitamins, minerals) bioactives (immunoglobuins, oligosaccharides, cytokines, immune cells) and microbiota using metabolomics, metagenomics, proteomics. A total of 1,940 HM samples, representing diverse settings and stages of lactation, were included in the analysis.

RESULTS

BEP and nicotinamide interventions significantly impacted B-vitamin concentrations in HM. Postnatal BEP supplementation affected HM composition more substantially than prenatal BEP, particularly influencing triglycerides, with a complex effect on composition over time. The effects were most pronounced in settings with higher maternal undernutrition (Pakistan vs. Burkina Faso). BEP interventions affected total protein, fat, and energy in Vital-LW, but not MISAME-III, possibly because the population was more undernourished. Nicotinamide supplementation in ELICIT primarily affected B-vitamins and the metabolome, serving as a positive control.

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CONCLUSIONS

These findings provide novel insights into how maternal nutritional interventions modify HM composition, highlighting the importance of optimizing the design and timing of such interventions to better support lactating mothers and their infants, especially in resource-limited settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP23_05

NAUNEHAL; Integrated Maternal, Neonatal and Child Nutrition, Health and Immunization Interventions in Conflict-Affected Areas of Pakistan: A Mixed-METHODS Quasi-experimental Study

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BACKGROUND AND OBJECTIVES

Pakistan's ongoing struggle to improve health indicators has been challenged by political and economic instability compounded by conflict. Rising insecurity has impeded delivery of nutrition and health interventions, especially in the provinces of Balochistan (BN) and Khyber Pakhtunkhwa (KP) (1). The 'Naunehal' research project tested integrated strategies to improve coverage of maternal & child nutrition & health services in insecure areas.

METHODS

Intervention strategies adopted were; community mobilization, information sessons on maternal nutrition and infant & young child feeding (IYCF), outreach teams offering nutrition, health and immunization services, and private health care provider engagement for IYCF counselling and immunization. This mixed-METHODS quasi-experimental study was implemented in three union councils (UCs), Kharotabad (BN), Bhana Mari (KP) and Bakhmal Ahmedzai (KP) with baseline and endline surveys, between March 2021-May 2022. For each intervention UC, a control UC of comparable size, population and coverage indicators was identified, where routine care was available. Each survey covered ~450, randomly selected households per UC, with at least one child under-five. Quantitative data collected from caregivers covered demographics, nutrition & WASH practices, care-seeking, and immunization, while qualitative data from FGDs and interviews captured community, health worker and stakeholder perspectives. Coverage was calculated overall and by UC, with mean & percentage point differences estimated using mixed effects linear regression, adjusted for survey design and sampling weights.

RESULTS

At endline, fully immunized children significantly increased (19.0% difference, (10.4%-27.7%),$p<0.0001$) in intervention UCs, while early initiation of breastfeeding (7.3%, $p=0.3426$), exclusive breastfeeding (5.3%,$p=0.5621$), and minimum dietary diversity (9.8%,$p=0.0727$) showed non-significant increases. Handwashing with soap before food preparation & feeding improved significantly ($p<0.0001$). Qualitative data indicated that while nutrition especially IYCF knowledge improved, translation into practice was impeded by systemic social, cultural, and structural barriers in these complex settings.

CONCLUSIONS

This low-cost integrated strategy of community mobilization and outreach services successfully reduced gaps in immunization coverage but had limited impact on nutrition and IYCF behaviors. A potential scale-up of this integrated intervention with added multisectoral components could be a promising nutrition and health strategy in complex contexts.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP23_07

ULTRA-PROCESSED FOODS AND CARDIOMETABOLIC RISK AMONG MALAYSIAN ADOLESCENTS: INSIGHTS FROM MALAYSIAN HEALTH AND ADOLESCENTS LONGITUDINAL RESEARCH TEAM STUDY (THE MYHEART STUDY)

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BACKGROUND AND OBJECTIVES

The rising consumption of ultra-processed foods (UPFs) globally has been linked to poor dietary quality and increased non-communicable disease risks. Adolescents, who may take these foods due to its convenience face heightened vulnerability, yet limited data exist on UPF intake among Malaysian adolescents. This study aimed to evaluate the relationship between UPF consumption and cardiometabolic risk among 17-year-old schoolchildren in Malaysia, using data from the 2016 Malaysian Health and Adolescents Longitudinal Research Team Study (MyHeART).

METHODS

A cross-sectional analysis was conducted on 975, 17 years old adolescents. Dietary intake was assessed through a 7-day recall and classified using the NOVA system. UPF intake was expressed as a percentage of total energy intake and categorized into quartiles. Cardiometabolic risk scores, derived from blood pressure, lipid profile, fasting glucose, body-mass-index, waist circumference, and physical fitness score were dichotomized into low and high-risk categories.. Ethics approval was obtained from Ethics Committee of University of Malaya Medical Centre (ethical approval number-14-376-20486).

RESULTS

A quarter (25.3%) of participants consumed ≥35% of their total energy from UPFs which showed positive correlation with fat ($r = 0.47$, $p < 0.001$), sugar ($r = 0.22$, $p < 0.001$), and sodium intake ($r = 0.28$, $p < 0.001$). Female adolescents were 2.38 times more likely than males to report high UPF intake (aOR: 2.38, 95% CI: 1.69–3.36, $p < 0.001$). However, no significant association was found between UPF intake quartiles and cardiometabolic risk scores ($p > 0.05$).

CONCLUSIONS

While no direct link was observed between UPF intake and cardiometabolic risk, the substantial UPF consumption highlights a critical area for public health intervention. Promoting healthier dietary choices among Malaysian adolescents could mitigate future non-communicable disease risks.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP23_08

FACTORS ASSOCIATED WITH MATERNAL BODY COMPOSITION AND THE ASSOCIATION OF MATERNAL BODY COMPOSITION WITH CHILD ANTHROPOMETRIC OUTCOMES: FINDINGS FROM BANGLADESH

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BACKGROUND AND OBJECTIVES

Maternal body composition (MBC) is a critical determinant of child health, influencing growth and developmental outcomes. In this study, we aimed to (i) identify factors associated with MBC; and (2) explore the relationship between MBC and child anthropometric outcomes, including weight-for-age (WAZ), height-for-age (HAZ), and body-mass-index (BMI)-for-age.

METHODS

A cross-sectional study was conducted among n=3621 women of reproductive age (14-49 years) and their children (0-59 months) in rural, non-slum urban, and slum areas of Bangladesh. MBC was assessed using bioelectrical impedance analysis, measuring fat mass (FM), fat-free mass (FFM), and body fat percentage. Anthropometric measurements of children, including weight, height, and body mass index (BMI), were converted into z-scores based on WHO growth standards. Data on socio-demographic variables, and dietary diversity were collected via structured questionnaires. Multivariable regression models were used to identify factors associated with MBC and linear regression models were used to explore the association of MBC with child growth indicators.

RESULTS

Key factors associated with MBC included age, wealth quintile, educational status, and food security. Women aged 30–39 years (AOR = 5.61) and 40–49 years (AOR = 8.22) were significantly more likely to have high fat mass compared to those under 20 years ($p < 0.001$). Women in the richest quintile had higher odds of high fat mass (AOR of 1.63, $p < 0.001$) compared to the women in the poorest quintile. Food insecurity, particularly mild food insecurity, was inversely associated with high fat mass (AOR = 0.81, $p = 0.086$). Maternal height was strongly associated with child HAZ scores across age groups (e.g., regression coefficient = 0.064, $p < 0.05$, overall), while maternal fat-free mass was positively correlated with child WAZ scores, particularly for children aged 24–35 months (coefficient = 0.064, $p < 0.05$). Maternal weight was significantly associated with child WHZ scores (e.g., coefficient = 0.020, $p < 0.05$, overall), with stronger effects observed in specific age groups such as 18–23 months and 24–35 months.

CONCLUSIONS

MBC is influenced by modifiable factors and is a significant predictor of child growth outcomes in Bangladesh. Context-specific interventions focusing on improving both maternal and child nutrition are essential to improve maternal and child nutrition in resource-constrained settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 24 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP24_01

MATERNAL PRENATAL DIET MEDIATES EPIGENETIC PATHWAYS TO SHAPE INFANT COGNITION: THE BARWON INFANT STUDY PRE-BIRTH COHORT

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BACKGROUND AND OBJECTIVES

Dietary patterns during pregnancy influence the developing foetal brain, potentially through DNA methylation (DNAm), a suggested molecular mechanism with long-lasting effects. Here we tested the relationship between maternal diet, DNAm profile in cord blood and neurodevelopmental outcomes at age 2 in the Barwon Infant Study (N = 1,074, mediation analysis N=562) in Victoria, Australia.

METHODS

We explored mediation of dietary-neurodevelopment outcomes by DNAm at birth. Maternal diet was assessed using a food frequency questionnaire at 28 weeks of gestation. DNAm was measured with the Infinium MethylationEPIC array. Neurodevelopmental outcomes, assessed using the Bayley-III scales, revealed that wholefoods diet was associated with improved child cognition and language (Gogos et al., 2024). Subtle changes across many pathways that may influence child cognition and language development were explored using an advanced epigenetic network approach, specifically Weighted Gene Co-expression Network Analysis.

RESULTS

We identified a DNAm module that associated with prenatal wholefoods diet and child's cognition and language. This module mediated the relationship between a wholefoods dietary pattern and increased child cognition (indirect effect p = 0.016, proportion mediated = 13%) and receptive language development (indirect effect p = 0.03, proportion mediated = 8%). Pathway enrichment analysis revealed that this module is linked to the RHO GTPase pathway, with the hub gene, MED13L, a candidate gene for cognitive and intellectual disorders involving language deficits. Validation of the key findings is currently being undertaken in another cohort.

CONCLUSIONS

This research supports the importance of maternal diet in promoting optimal child neurodevelopment, mediated through epigenetic pathways. It highlights the potential for tailoring nutritional interventions to target the epigenetic control of genes in specific pathways to enhance neurodevelopmental outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP24_02

METABOLOMIC SIGNATURE OF A SUSTAINABLE BRAIN-HEALTHY DIET IN OLDER PERSONS

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BACKGROUND AND OBJECTIVES

The Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diet, a sustainable diet developed to promote brain health, has been linked to reduced cognitive decline. However, the biological pathways underlying this association remain unclear. Developing a panel of objective biomarkers for adherence to this diet could give novel insights on such mechanisms and might help to identify target populations for clinical trials or prevention programs aimed at lowering cognitive aging through nutritional strategies. To address this challenge, metabolomics, including biomarkers of both external exposures and endogenous metabolism, is a valuable tool. The objective of this study was to characterize a blood metabolomic signature of adherence to the MIND diet and evaluate its prospective association with cognitive trajectories in older adults from the general population.

METHODS

We leveraged data from the French Three-City cohort, that included individuals aged ≥65 years in 1999. Two independent nested case-control samples were defined contrasting participants with higher versus lower 12-year cognitive decline trajectories: a discovery (n=418) and a validation sample (n=420). A targeted metabolomic analysis allowed to quantify 154 diet-related metabolites in plasma at study baseline. We first analyzed the 344 participants from the first sample who answered a comprehensive dietary survey to identify, with a penalized regression approach (LASSO), a signature of metabolites linked to greater MIND diet adherence. We then leveraged the full discovery and validation samples to evaluate associations between the metabolomic signature and cognitive decline.

RESULTS

Eight metabolites were selected in the metabolomic signature of the MIND diet; three metabolites were associated with greater adherence (3-HHA, 5-HIAA and betaine, mainly phenolic acids and amino acid derivatives, derived from fruits and vegetables intake), and five metabolites with lower adherence (1-methylhistidine, cyclo(L-leucyl-L-prolyl), tartaric acid, Myristoyl-carnitine and DHEA-S, derived from red meat, coffee, wine or endogenously produced). The MIND metabolomic signature was significantly associated with lower odds of cognitive decline in the discovery sample. RESULTS were in the same direction, although not statistically significant, in the validation sample.

CONCLUSIONS

This study highlights a potential metabolomic signature of the MIND diet to support brain health at the molecular level and may provide an objective measure of adherence to a brain-healthy diet for cognitive decline prevention.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP24_03

AI-POWERED THE CLASSIFICATION OF NOVA FOOD PROCESSING: EXPLORING TAIWANESE FOODS WITH NATIONALLY REPRESENTATIVE DATA

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BACKGROUND AND OBJECTIVES

Tools for classifying food processing levels can assist the public in choosing healthier foods. Although studies have developed machine learning models for NOVA classification, challenges persist in categorizing complex foods, particularity in Asian regions. Large Language Models (LLMs) demonstrate powerful cross-domain capabilities and have been applied to various healthcare tasks. This study evaluates the accuracy of Claude 3.5 and GPT-4o in determining NOVA classifications for commonly consumed Taiwanese foods.

METHODS

The 2013-2016 Nutrition and Health Survey in Taiwan (NAHSIT) provided nationally representative dietary data collected through 24-hour dietary recalls. Food items were classified in to four NOVA categories: **Unprocessed or minimally processed foods, Processed culinary ingredients, Processed foods, Ultra-processed foods (UPFs).** The top 200 most frequently consumed items from each group (800 items in total) were selected as the test sample. The evaluation involved two rounds: the first assessed the accuracy of both LLMs without any prior references, while the second evaluated them after providing NOVA-related literature as calibration guidance.

RESULTS

Claude 3.5 outperformed GPT-4o overall, achieving an accuracy rate of 77.88%, compared to GPT-4o's 63.38%. For **processed foods** and **UPFs**, Claude 3.5 performed notably better, achieving accuracy rates of 73.25% and 97.75% respectively, compared to GPT-4o's 33.50% and 69.50%. However, for **unprocessed or minimally processed foods**, GPT-4o achieved slightly better accuracy (85.25%) than Claude 3.5 (79.75%). Chi-square tests revealed statistically significant differences ($p < 0.001$) between the accuracy rates of two LLMs. Indicating distinct performance variance in NOVA classification.

CONCLUSIONS

LLMs demonstrate potential in classifying food processing levels, particularly for complex foods items. Claude 3.5 outperformed GPT-4o overall, with exceptional performance in identifying UPFs. These findings highlight the potential of LLMs in food classification systems, offering AI-based initial assessments for professional validation. Such tools could support nutrition education and assist the public in choosing healthier foods. Future research should expand datasets and refine prompts with updated literature to improve accuracy, particularly for minimally processed foods.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP24_04

MODELLING THE HEALTH, EQUITY, AND COST-EFFECTIVENESS IMPACTS OF FOOD TAXES AND SUBSIDIES IN AUSTRALIA

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BACKGROUND AND OBJECTIVES

The World Health Organization recommends food taxes and subsidies as part of a suite of strategies to address non-communicable diseases (NCDs). This study aimed to estimate the dietary, health, equity, and economic impacts of two fiscal food policies in Australia: (i) a 20% tax on less healthy foods (i.e., sugar-sweetened beverages, confectionery, snackfoods, biscuits, pastries, ice cream, and processed meat) and (ii) a 20% subsidy for fruits and vegetables.

METHODS

For each policy, we assumed a 100% pass-through rate and used nationally representative dietary intake and consumer purchasing data to estimate the population-level dietary impacts. We used a proportional multi-state lifetable-based model to translate the effects on fruit and vegetable intake and body mass (via energy intake) into changes in the incidence of seven diet-related noncommunicable diseases and the associated health-adjusted life years (HALYs) for the 2020 Australian population. Cost-effectiveness was assessed from an extended healthcare perspective, which included costs for policy implementation (assumed to equal 2% of tax revenue or subsidy costs, respectively), and total health care costs (i.e., costs for modelled diseases and other healthcare expenditures). Analyses were stratified by socio-economic quintile, and health-effects were attributed to individual food categories.

RESULTS

Over a 25-year period, a tax on less healthy foods could lower average daily per capita energy intake by ~400 kJ (i.e., 96 kcal), avert ~79,000 NCD deaths, produce ~750,000 HALYs, promote health equity (i.e., 26% of HALYs accruing among lowest socio-economic quintile), and be cost-saving (about -$11 billion in net costs). Approximately one-tenth of these potential gains would be attributable to taxing sugar-sweetened beverages. The subsidy for fruits and vegetables could increase daily per capita fruit and vegetable intake (i.e., ~28g, and ~29g per capita per day, respectively), prevent ~8,000 NCD deaths, generate ~33,000 HALYs, promote health equity (i.e., 24% of HALYs accruing in the poorest quintile), and be cost-effective (~$31,000 incremental cost per HALY gained).

CONCLUSIONS

Our study supports the use of taxes and subsidies as equitable and cost-effective - or even cost-saving - strategies to improve diets, prevent diet-related NCDs, save lives, and reduce health disparities in Australia.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP24_05

EXPLORING FACTORS ASSOCIATED WITH DIET QUALITY AMONG SCHOOLCHILDREN IN RURAL CAMBODIA

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BACKGROUND AND OBJECTIVES

Cambodia faces a double burden of communicable diseases and non-communicable diseases (NCDs), with NCDs accounting for 64% of all deaths in Cambodia. There is a growing trend of children consuming more ultra-processed foods and foods high in fat, salt, and sugar, but few studies have documented dietary patterns among school children. This study aims to evaluate children's diet quality in four provinces in Cambodia and identify socio-demographic factors associated with dietary choices to identify future interventions to prevent overweight and obesity.

METHODS

This analysis uses data from a cross-sectional survey conducted in 2024, encompassing 691 schoolchildren aged 6-11 years across four rural provinces: Takeo, Kampot, Kampong Speu, and Kampong Thom. Diet quality was measured using the Diet Quality Questionnaire (DQQ). The outcomes of interest were the Global Dietary Recommendation (GDR-Score), NCD-Protect Score, NCD-Risk Score, minimum dietary diversity, All-5 recommended foods, and individual healthy and ultra-processed foods. Socio-demographic factors, including child sex and age and caregiver's education, marital status, and wealth quintile, were included in bivariate and multivariate logistic regression analyses.

RESULTS

The average GDR score was 9.51, the average NCD-Risk Score was 2.21, and the average NCD-Protect Score was 2.73. Among the sampled children, approximately 63.24% had minimum food diversity, and 16% achieved All-5 recommended food groups. However, only 9% had any Vitamin A-rich fruits and 54% consumed dark green leafy vegetables. Among ultra-processed foods, 41% consumed sweet beverages, 33% consumed salty or fried snacks, and 16% consumed fast food and instant noodles. Sociodemographic characteristics did not vary between children with GDR >=10 (meeting half of the WHO recommendation for a healthy diet) vs. GDR<10.

CONCLUSIONS

The study's findings show that while, on average, schoolchildren in rural Cambodia are close to meeting half of the WHO recommendation for a healthy diet, there are opportunities to enhance diets further. Programs should promote the consumption of vitamin A-rich fruits and dark green leafy vegetables and employ a variety of approaches to discourage the consumption of ultra-processed food such as sweet beverages, salty or fried food, and fast food, including noodles. A limitation of this study is that the DQQ has not been validated for the 6-11 age group, which should be considered when interpreting the RESULTS.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP24_06

What is a snack? Types of snacks and why parents in Southern Thailand give them to their children: a mixed METHODS study

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BACKGROUND AND OBJECTIVES

Snacks contribute 15-30% of children's daily energy intake globally(1) raising concerns about unhealthy eating and obesity(2). However, snack definitions vary(3). We aim to explore 1) how parents in urban and rural areas of Thailand's southernmost border provinces (SBPs) define snacks, 2) what types of snacks are consumed by children and reasons for giving snacks.

METHODS

Four focus groups (n=10/each) with parents of children aged 3-5y living in urban and rural areas of SBPs were recruited for semi-structured interviews. Parents were asked: What is a snack? Why and when do you give snacks to your child?. Thematic analysis(4) was used to synthesise qualitative findings with NVivo 14. The International Complementary Feeding and Eating Tool (ICFET)(5) was used to survey 279 parents attending nurseries in SBPs for frequency of consumption and reasons for giving snacks. Scores for favourite snack categories (commercial, traditional, sweet, savoury) and reasons (scales 1-5) were compared between urban and rural settings using SPSS V28.

RESULTS

Qualitative findings identified five themes of snack definitions: 1) A supplementary food; 2) foods containing monosodium glutamate (MSG) or 'Tua Pong Bejing'; 3) Not rice; 4) Commercially produced snack foods; 5) Foods given for emotional control and comfort. Parents lack consensus regarding strategies about when to offer snacks. Commercially produced snacks were preferred by over 80% of young children in both urban and rural areas, while traditionally made snacks were the least favoured (<20%). More rural children preferred sweet snacks (80%) compared to urban children (55%). Parents of urban children more often reported giving snacks because of child boredom [Mean(SD) (2.79(1.03) vs (2.51(0.93)] rural, (P=0.051) and at school [(3.07(1.09) vs (2.56(0.98)] rural, (P=0.031). Rural children were more influenced by advertised snacks [(2.96(1.01) vs (2.73(1.11)] urban, (P=0.068) and peers [(2.49(0.95)) vs (2.23(1.04)] urban, (P=0.030).

CONCLUSIONS

Snack definitions are highly subjective and varied. Parents predominantly viewed snacks as foods other than rice, or commercially produced snacks, flavoured with MSG. Commercial, cultural and social norms are shaping children's snacking behaviour in Thailand's SBPs, in rural as well as urban areas.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP24_07

ANTENATAL MULTIPLE MICRONUTRIENT VERSUS IRON-FOLIC ACID SUPPLEMENTATION: OUTCOMES OF AN IMPLEMENTATION TRIAL WITHIN UNRWA HEALTH SYSTEM SERVING PALESTINE REFUGEES IN JORDAN

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BACKGROUND AND OBJECTIVES

Maternal anemia and micronutrient deficiencies (MNDs) are common in Palestine refugees.1-2 Multiple micronutrient supplementation (MMS) can reduce MNDs and adverse pregnancy outcomes.3-5 Since 2020, UNWRA, serving ~90,000 Palestine refugee pregnant women annually,6 has conducted implementation research, per WHO guidelines,7 to guide policy on replacing iron-folic acid (IFA) with MMS in ANC. The study objective was to compare implementation outcomes of MMS vs IFA delivery within UNRWA ANC system in Jordan.

METHODS

After a six-month MMS pilot in 2large clinics,8 a 10-month implementation trial was conducted whereby 13 clinics (2 pilot plus 11 randomized) were assigned for midwives to issue 180-ct bottles of UNIMMAP MMS9 at pregnancy registration; another 12 clinics were randomized to IFA standard-of-care whereby physicians prescribed folic acid (FA, 0.4 mg) in the 1st trimester and IFA (100 mg & 0.4 mg) thereafter, both in 10-ct blister packs. Coverage was assessed at registration. At up to 7 follow-up visits, histories of side effects and adherence, validated by weighing bottles, were assessed. Acceptability was assessed by anonymously interviewing mothers at 6 larger clinics in each group. Hemoglobin distributions and anemia, routinely assessed at registration and mid-pregnancy, were compared by clinic-assignment. Data were deidentified, abstracted from the Agency's eHealth system and analyzed, with relative risks (RR) adjusted for gestational age and design effect by GEE. UNRWA Research Review Board and Johns Hopkins IRB provided ethical approvals.

RESULTS

Throughout March-December 2023, 9754 and 5574 women registered in MMS and IFA clinics. Coverage per protocol at registration was 94% for MMS, 79% for FA, and 86% for IFA. Up to 7th follow-up visits, in MMS vs IFA recipients, 8-13% vs 16-28% reported constipation ($p<0.0001$), 82-84% vs 74-82% reported excellent ($\geq$90%) adherence, and 5-6% vs 10-17% reported poor (<70%) adherence. In exit interviews, 52% vs 41% reported improved appetite, 65% vs 59% mentioned feeling healthier and 51% vs 41% noted having more energy (all $p<0.04$). In 4222 and 2361 1st-2nd trimester registrants, in MMS vs IFA clinics, with Hb$\geq$10 g/dL (UNRWA treatment threshold), the RR of mid-pregnancy moderate-to-severe anemia (Hb<10 g/dL) was 0.66 (95% CI: 0.49-0.90), favoring MMS.

CONCLUSIONS

MMS is feasibly implemented as a standard of care within the UNRWA ANC system, evident by superior coverage, adherence, acceptability and effectiveness in anemia prevention.

CONFLICTS OF INTERESTS

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OAP24_08

GESTATIONAL WEIGHT GAIN PATTERNS AND DISTRIBUTION IN FIVE LOW- AND MIDDLE-INCOME COUNTRIES ACROSS AFRICA AND ASIA

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BACKGROUND AND OBJECTIVES

Adequate gestational weight gain (GWG) is a crucial factor in ensuring a healthy pregnancy. However, there is limited population-based data from low- and middle-income countries (LMICs) to inform evidence-based guidelines. We aimed to assess the prevalence and trends in GWG stratified by early-pregnancy body mass index (BMI) using data from a multi-site cohort study in five LMICs across Asia and Africa

METHODS

We analyzed GWG data from the ongoing Pregnancy Risk, Infant Surveillance, and Measurement Alliance (PRISMA) open cohort study. Participant pre-pregnancy data were classified into BMI groups using weight taken at or before 9 weeks gestation or imputed using a mixed-effects restricted cubic spline mode if weight was assessed between 10 - 20 weeks gestation. We calculated total GWG and GWG adequacy based on participants' early pregnancy BMI using the Institute of Medicine (IOM) guidelines. Demographic, clinical and lifestyle characteristics were stratified by early-pregnancy BMI groups and IOM adequacy levels. Additionally, latent class trajectory modeling for GWG was used to identify patterns of GWG and group pregnant women into IOM categories based on these patterns.

RESULTS

Out of 5,134 pregnant women, 17% were underweight (BMI <18.5 kg/m2), 19% were overweight (25-29.9 kg/m2), and 10% were obese (≥30 kg/m2) prepregnancy. Mean gestational age at enrollment was 13±3.6 weeks. About one-third (37%) had inadequate gestational weight gain (I-GWG), while one-third (33%) had excessive gestational weight gain (E-GWG). Mean (SD) GWG among underweight, normal, overweight and obese women were 8.9±3.5, 8.3±3.5, 7.1±4.1, and 5.9±4.5 kg, respectively. The proportion of I-GWG was highest (54.8%) among women who were underweight at the start of pregnancy; the proportion of E-GWG was highest (54.6%) among women who were obese at the start of pregnancy. Among all births, 17% were classified as low birthweight, with 48% occurring in the I-GWG group and 22% in the E-GWG group, fetal loss before 20 weeks occurred in 1.4% of pregnancies overall, with 2.1% among E-GWG and 1.8% among I-GWG. No fetal losses were observed among those with adequate gestational weight gain.

CONCLUSIONS

Inadequate gestational weight gain is common for women underweight and normal weight at the start of pregnancy. Both I-GWG and E-GWG lead to adverse pregnancy outcomes. Given that the elimination of all forms of malnutrition remains a global priority, focused and timely interventions during pregnancy should be prioritized.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP24_09

Impact of a French social marketing campaign to increase parental support and physical activity in adolescents aged 11-14 years: RESULTS from a longitudinal study

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BACKGROUND AND OBJECTIVES

Due to the lower prevalence of teenagers who reach physical activity guidelines, Santé Publique France launched in September 2022 a social marketing campaign targeting teenagers' parents with the aim to increase several forms of parental support (1- encouraging their teenagers to be physical activity, 2- being physical activity with them, and 3- helping them to find the sport they like).

Aims of this study were to evaluate the variations of 1) parental support' determinants, 2) parental support, and 3) teenagers' physical activity between before and after campaign.

METHODS

A prospective study was conducted on the Internet. A representative sample of 4,005 French parents was recruited and questioned before the campaign was broadcast (t0), in the month that followed (t1) and 10 months later (t2). Analyses were conducted on parents who responded at t1 and t2 (N=2,808 and N=2,173 respectively). The association between changes in the indicators and recognition of the campaign was assessed using Generalized Estimation Equation (GEE) adjusted models.

RESULTS

Overall, a significant difference in the variation of self-efficacy for helping their teenager to find the sport he/she loves was observed at T1 between parents who did and did not recall the campaign ($p<0.05$), more specifically among girls (p-value=0.03) and parents with low socio-professional status ($\beta=0.06$, $p=0.02$). Among those who recalled the campaign, a significant difference for the variation of encouragements was observed at T1 ($\beta=0.04$, p-value=0.04).

Among parents with an initial low level of positive attitude, those who recalled the campaign showed more frequently positive attitude for encouraging their teenager to be physically active (p-value=0.04 at T1 and p-value=0.0008 at T2), and for engaging in physical activity with their teenager (p-value=0.0009). They increased more their practice of physical activity with their teenager at T1 (p-value=0.0003). Among parents with a teenager with an initial low physical activity level, recognition of the campaign was associated with an increasing of physical activity during the week-end, frequency of active travel for going to school, of sport practiced in a club and of informal physical activities ($p<0.05$).

CONCLUSIONS

This evaluation shown positive and encouraging RESULTS for a first broadcast, sometimes maintained over the long term. In view of these promising RESULTS, the campaign was rebroadcasted in September 2023 and will be investigated using the same cohort of parents.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 26 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP26_02

COULD A BASIC INCOME IMPROVE DIET QUALITY AND REDUCE DIETARY INEQUITIES? AN AGENT-BASED COMPLEX SYSTEMS SIMULATION MODEL

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BACKGROUND AND OBJECTIVES

The inadequacies of current social protection policies in improving diet quality and reducing dietary inequities have renewed interest in a Basic Income (BI) to ensure all Canadians can afford a healthful diet. However, due to the challenges of conducting large, long-term, population-based randomized controlled trials, there are no data pertaining to the impact of different forms of a BI on diet quality and dietary inequities. We developed the first agent-based complex systems simulation model to investigate the effectiveness of 20 different forms of a BI on diet quality and dietary inequities among adults in Canada.

METHODS

Agents in our model are adults who are assigned an age, sex, ethnicity, household income, food budget, diet quality (Healthy Eating Food Index-2019 scores from 0-80; HEFI-2019), energy intake and food spending based on nationally representative data. At each bi-weekly time step, agents receive their regular income plus a BI (if eligible), calculate their new food budget, and incrementally adjust their food spending based on empirically-derived decision rules until it is within 10% of their new food budget. Agents' diet quality evolves in conjunction with incremental increases in food spending, leading to emergence of a new distribution of diet quality by income at the population level for each of the 20 forms of a BI. These 20 forms of a BI combine different BI models (universal, negative income tax, income top-up), benefit levels (low-income cut-off, low-income measure, market basket measure, living wage), and reduction rates (0-100%).

RESULTS

Different combinations of BI models, reduction rates and benefit levels did not meaningfully improve HEFI-2019 scores at a population level, with maximum improvements of 1.5 points. All BI models, reduction rates and benefit levels improved HEFI-2019 scores in the lowest income quintile by up to 4 points, which may be clinically meaningful. However, a universal BI, higher benefit levels and a 0% reduction rate also improved HEFI-2019 scores by up to 1.3 points in the middle and highest income quintiles.

CONCLUSIONS

A BI may not meaningfully improve diet quality at a population level in Canada, regardless of its design features. All forms of a BI may improve diet quality in the lowest income groups and may thereby reduce dietary inequities. However, a universal BI may be less effective in reducing dietary inequities because it also improves diet quality in higher income groups.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP26_03

NUT INTAKE, FUNCTIONAL LIMITATIONS, AND QUALITY OF LIFE IN OLDER ADULTS: FINDINGS FROM NHANES 2003-12

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BACKGROUND AND OBJECTIVES

Ageing is associated with functional limitations that can compromise quality of life (1, 2). Limited research suggests nut consumption may prevent or delay these limitations in older adults (3). This study aimed to determine associations between habitual nut intake, functional limitations, and quality of life in older adults.

METHODS

This cross-sectional study included data from 5,807 adults aged 60 years and older who participated in the U.S. National Health and Nutrition Examination Survey (NHANES) between 2003 and 2012. Nut intake was assessed using two 24-hour dietary recalls. Functional limitations were measured using the NHANES Physical Functioning Questionnaire (19 common daily life activities). Quality of life was evaluated using the standard four-question health-related quality of life (HRQOL-4) questionnaire. The HRQOL-4 comprises four questions focusing on the participant's general health status, number of physically unhealthy days, number of mentally unhealthy days, and number of days with activity limitations in the 30 days preceding the survey. Negative binomial regression and logistic regression were used to examine associations between nut intake and both functional limitations and quality of life.

RESULTS

Older adults who did not consume nuts (0 g/day; n=2579 [44.4%]) experienced a higher number and greater severity of functional limitations compared to those who consumed nuts (>0 g/day; n=3228 [55.6%]). After adjusting for age, sex, body mass index (BMI), ethnicity, household size, education, smoking status, history of cardiovascular disease (CVD) and type 2 diabetes mellitus (T2DM), non-protein energy, total protein intake, history of arthritis, and physical activity, nut consumers were estimated to have 14% fewer functional limitations (IRR = 0.86, 95% CI 0.76, 0.98, p=0.019) compared with non-consumers and lower severity of these limitations (β = -0.77, 95% CI -1.22, -0.32, p=0.001). Furthermore, nut consumers compared to non-consumers had a reduced odds of poor physical health (OR = 0.79, 95% CI 0.65, 0.96, p=0.020) and activity limitations (OR = 0.72, 95% CI 0.54, 0.95, p=0.023).

CONCLUSIONS

Older individuals who consume nuts are more likely to experience fewer functional limitations and fewer physically and mentally unhealthy days. Thus, the role of nuts consumption should be further investigated for its potential.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP26_07

IS THE BRASCORE, AN INDEX THAT MEASURES ADHERENCE TO THE DIETARY GUIDELINES FOR THE BRAZILIAN POPULATION, ASSOCIATED WITH A REDUCED RISK OF OVERWEIGHT AND OBESITY? FINDINGS FROM THE NUTRINET-BRASIL COHORT STUDY

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BACKGROUND AND OBJECTIVES

The Dietary Guidelines for the Brazilian Population (hereinafter referred to as the Dietary Guidelines) provide recommendations for a healthy and sustainable diet. They bring important conceptual innovations by pioneering using the Nova classification system as the basis for their recommendations. The BraScore was developed to assess the adherence to Dietary Guidelines. This study aims to assess the association between the BraScore and the incidence of overweight or obesity in the NutriNet-Brasil cohort study.

METHODS

Data from 21,930 participants who completed the two firsts dietary 24-hour recalls, were free of overweight or obesity at baseline, and had no missing on covariates were used. The tool employed for dietary data collection, Nova24h, specifically collects information on food processing. The BraScore was applied on food consumption data and includes 10 components, divided into three dimensions, with scores ranging from 0 to 100 points: *1. To be consumed:* legumes (0 – 15), fruits (0 – 10), vegetables (0 – 10), diversity (0 – 5); *2. To be limited:* eggs, fish, milk, and poultry (0 – 5), red meat (0 – 5), processed foods (0 – 5), table sugar (0 – 2.5), table salt (0 – 2.5); *3. To be avoided:* ultra-processed foods (0 – 40). Higher scores indicate greater adherence. New cases of overweight or obesity (≥25 kg/m²) were assessed over the follow-up period. Crude and adjusted (age, gender, education, asset score, race/skin colour, region of the country, physical activity) Cox proportional hazard ratio models were used.

RESULTS

There were 11,516 incident cases of overweight or obesity over 58,043.3 person-years during a median follow-up of 28.8 months. Adjusted models showed that a 10% increase in the BraScore was associated with 17% reduction in the risk of overweight or obesity (HR: 0.83, CI95% 0.82-0.84). According to the BraScore quintiles, the risk of overweight or obesity in the highest quintile was 48% lower compared to the lowest quintile (HR: 0.52, CI95% 0.49-0.55).

CONCLUSIONS

The analyses demonstrated that the BraScore is associated with overweight and obesity outcomes in the NutriNet-Brasil cohort study. This finding highlights the predictive validity of the index, which holds significant potential for use in epidemiological studies on Brazilian dietary patterns, adherence to dietary guidelines, and health outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP26_08

GLOBAL RESEARCH TRENDS IN SCHOOL FOOD ENVIRONMENT: A BIBLIOMETRIC ANALYSIS USING WEB OF SCIENCE AND VOSVIEWER

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BACKGROUND AND OBJECTIVES

The school food environment is vital in shaping healthier generations and fostering lifelong nutritious habits. This study used bibliometric analysis to explore and summarise publications on the school food environment, trace the field's evolution, and predict future research trends.

METHODS

Publications from the past three decades (1995–2024) were retrieved from the Web of Science (WoS) core collection using the search terms “food environment*” (Topic) and "school*" OR "universit*" (Topic). Only articles were analysed using VOSviewer. A thesaurus file was created to deduplicate terms and ensure consistency. VOSviewer generated bibliometric maps based on keyword co-occurrence, and the association strength method was applied to normalise link strength between items.

RESULTS

1,284 articles were retrieved, with 926 (72%) published in the last decade. The USA led in publications (616), nearly five times more than England, the second-leading country (137). In the keyword co-occurrence analysis, 199 of 3,494 keywords met the threshold of at least ten occurrences, forming six clusters. Central nodes included “food environment,” “obesity,” “children,” and “association” (occurrence weight = 616, 579, 236, and 193, respectively), highlighting established research areas. Conversely, keywords like “university students,” “mixed METHODS,” “neighbourhood deprivation,” and “acculturation” (occurrence weight = 12, 11, 11, and 10, respectively) showed fewer connections, representing emerging research areas that have not yet been extensively explored. Overlay visualisation revealed emerging themes in the last five years, including “food desert”, “food insecurity,” “disease,” and “ultra-processed food.”

CONCLUSIONS

Advancing this research field requires a more holistic and multidisciplinary approach, with qualitative research offering a promising avenue for further exploration.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP26_09

IDEAL CARDIOVASCULAR HEALTH AND COGNITIVE PERFORMANCE: PRELIMINARY FINDINGS FROM THE NORTHERN IRELAND COHORT OF LONGITUDINAL AGEING (NICOLA)

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BACKGROUND AND OBJECTIVES

Dementia is now the seventh leading cause of death worldwide [1]. Research suggests that over 40% of dementia cases can be prevented or delayed by addressing modifiable risk factors and improving cardiovascular health (CVH) [2]. Adherence to the American Heart Association Life's Essential 8 (LE8) metric for ideal CVH could be protective against cognitive impairment [3,4,5]. However, evidence is limited by the small number of studies conducted and variation in both CVH definition and cognitive measures. The objective was to investigate the cross-sectional association between CVH, as measured by the LE8 metric, and cognitive performance in older Northern Irish adults.

METHODS

The sample comprised of older adults without any pre-existing dementia or cardiovascular disease enrolled in the Northern Ireland Cohort for the Longitudinal Study of Ageing (NICOLA). The LE8 metric for CVH computed from four health behaviours (diet, physical activity, smoking status, sleep) and four clinical measures (body mass index, blood sugar, blood lipids, blood pressure) was applied to classify participants as high CVH (LE8 ≥ 80), moderate CVH (LE8 50 to 79), and low CVH (LE8 0 to 49). Global cognitive performance was assessed using the Mini-Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCA). Logistic models adjusted for age, sex, socio-economic status, educational attainment, were used to examine associations between the tertiles of CVH and cognitive performance.

RESULTS

A total of 2,352 participants (53% female) aged 64±8.9 years were studied, of whom 14.5%, 77% and 8.5% had low, moderate and high CVH respectively. Those with high CVH were more likely to be female, younger with healthy BMI and have better cognition. In adjusted models, a 5-point increase in the LE8 score was associated with a 0.07 (95% CI: 0.05-0.10) increase in MMSE, and a 0.12 (95% CI: 0.08-0.17) increase in MoCA score [both $p < 0.001$]. Participants with greatest adherence to LE8 were significantly less likely to have poor global cognitive function (≥1.5 SD below mean MoCA). Compared to low CVH, the adjusted odds ratio (95% confidence interval) for poor global cognition was 0.62 (0.41-0.93) for moderate CVH and 0.38 (0.16-0.95) for high CVH.

CONCLUSIONS

Better CVH, as measured by a higher LE8 score, was significantly associated with better cognitive performance amongst older Northern Irish adults. This suggests that LE8 recommendations may benefit both cardiovascular and cognitive health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 27 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP27_01

ASSOCIATIONS OF MATERNAL CARDIOVASCULAR HEALTH IN PREGNANCY WITH OFFSPRING NEURODEVELOPMENT WITHIN THE FIRST 5 YEARS: A PROSPECTIVE BIRTH COHORT STUDY

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BACKGROUND AND OBJECTIVES

The first 5 years of life are sensitive periods for neurodevelopment. So far, the effects of the combination metrics of cardiovascular health (CVH) during pregnancy on offspring's neurodevelopment in these crucial periods remain unknown.

METHODS

1007 mother-child pairs recruited from 2013 to 2016 in the Shanghai Birth Cohort were included in the study. The maternal CVH, including five metrics of BMI, blood pressure, blood glucose, sleep and smoking, was measured or collected during the second trimester. Each metric was divided into ideal, intermediate, and poor, and assigned 2, 1 and 0 points, respectively, yielding a total CVH score range of 0 to 10. The offspring neurodevelopment at 2-3 years and 4-5 years were evaluated by Bayley-III and WPPSI-IV, respectively. Scores in the lowest quartile for the Bayley-III scale and WPPSI-IV were defined as suboptimal development. Univariate linear, multivariate linear, and logistic regression were used to estimate associations between maternal gestational CVH and offspring neurodevelopment.

RESULTS

There was a correlation between the cognitive and language of Bayley-III scores at 2-3 years and the visual space index (VSI) and working memory index (WMI) of WPPSI-IV scores at 4-5 years (R = 0.23 and R = 0.22 for VSI, $p<0.001$; R= 0.14 and R =0.15 for WMI, $p<0.001$). After adjusting confounders, with a 1-point higher maternal CVH score, the scores of cognitive and language at 2-3 years were significantly increased by 1.63 [95% confidence interval (CI), 0.42-2.83, P = 0.008] and 0.84 (95%CI, 0.005-1.67, P=0.049), respectively. Similarly, the scores of VSI and WMI at 4-5 years were significantly increased by 0.92 (95%CI, 0.16-1.68, P = 0.018) and 0.71 (95%CI, 0.01–1.40, P = 0.047), respectively. The RESULTS of the logistic regression model with adjusted confounders showed that the risk of suboptimal cognitive development at 2-3 years was reduced by 0.84 (95%CI, 0.73-0.96, P = 0.013) with a 1-point higher maternal CVH score, and the risk of cognitive development in female and male offspring was decreased by 0.79 (95%CI, 0.66-0.96, P =0.017) and 0.83 (95%CI, 0.71-0.98, P =0.025), respectively.

CONCLUSIONS

Our study first proved that maternal CVH exposure in pregnancy has an enduring effect on offspring neurodevelopment in the first 5 years of life, and female offspring brain development was more sensitive to maternal CVH exposure during pregnancy. Maternal CVH metrics as an indicator may be applied to clinical practice to identify children at risk of neurodevelopment delay and then implement an early intervention.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP27_02

EFFECT OF MULTIPLE MICRONUTRIENT SUPPLEMENTATION AND IRON-FOLIC ACID SUPPLEMENTATION ON HEMOGLOBIN LEVELS OF PREGNANT WOMEN, FETAL GROWTH AND BIRTH OUTCOME: A RANDOMISED CONTROL TRIAL IN OGBOMOSO, NIGERIA

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BACKGROUND AND OBJECTIVES

Maternal nutrition is crucial for both mother and fetus (1,2), yet over 40% of pregnant women in low- and middle-income countries, including Nigeria, face micronutrient deficiencies like iron deficiency anemia, increasing risks of adverse birth outcomes (2,3). This study assessed the effects of multiple micronutrient (MMS) versus Iron-Folic Acid (IFA) supplementation on maternal hemoglobin and fetal growth.

METHODS

This double-blind, two-arm randomized controlled trial in Ogbomoso, Nigeria, recruited pregnant women at <= 24 weeks gestation. Participants were randomized to receive either IFA or MMS. Maternal hemoglobin, fetal weight (FW), femur length (FL), fetal abdominal circumference (FAC), and fetal head circumference (FHC), were assessed at baseline, four weeks, and delivery.

RESULTS

Table 1.0 Effect of MMS vs IFA on fetal growth

Study group	**Baseline FW (Kg)**	**4 weeks FW (Kg)**	**P value**
MMS group	1.64 ± 0.47	2.22 ± 0.57	0.0000
IFA group	1.38 ± 0.72	1.94 ± 0.98	0.001
	Baseline FHC (cm)	**4 weeks FHC (cm)**	**P value**
MMS group	28.32 ± 2.21	30.53 ± 2.21	0.0002
IFA group	28.39 ± 3.22	30.30 ± 2.26	0.06

Mothers were 29 years on average, fathers 36, with a parity of 2 and BMI of 28.14 ± 5.94. Most parents (51.72%) had secondary education, while 30% of mothers held higher degrees. Hemoglobin levels showed minimal changes, rising slightly in the IFA group (10.63 to 11.20 g/dL, p = 0.49) and remaining stable in the MMS group (10.79 to 10.89 g/dL, p = 0.82). The MMS group demonstrated significantly greater improvements in femur length (5.93 to 6.84 cm, p = 0.0000) and fetal head circumference (28.32 to 30.53 cm, p = 0.0002) compared to smaller changes in the IFA group.

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CONCLUSIONS

Hemoglobin levels showed minimal changes in both groups. MMS significantly improved fetal weight, abdominal circumference, femur length, and head circumference over four weeks compared to IFA. Future research should explore long-term impacts of MMS versus IFA on maternal and infant health, including cognitive and physical development.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP27_03

SOCIOECONOMIC INEQUALITIES IN THE ASSOCIATION BETWEEN DIET QUALITY AND INCIDENT CARDIOVASCULAR DISEASES

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BACKGROUND AND OBJECTIVES

Individuals with a lower socioeconomic position (SEP) consistently face higher risks of cardiovascular diseases (CVDs). Diet quality is crucial to the development of CVDs. Poor diet quality is more prevalent in low SEP populations, significantly increasing their CVD risk, which may partially explain the existing health inequalities. However, it remains unclear whether a socioeconomic difference exists in the association between diet quality and CVDs, and whether such difference may further contribute to health inequalities. Therefore, we aimed to evaluate how SEP modifies the associations between diet quality and incident CVDs.

METHODS

We analyzed data from 82,360 participants from the Dutch Lifelines Cohort (30-80 years, no CVDs at baseline). Incident CVD cases were identified by self-report questionnaires and electrocardiogram during follow-ups. Lifelines Diet Score – a diet quality indicator based on Dutch dietary guidelines – was calculated with a 110-item food frequency questionnaire. SEP was defined by education and income. Cox proportional hazards models were used to assess the associations of diet quality, SEP, and incident CVDs, adjusted for age, sex, employment, energy intake, BMI, alcohol intake, smoking, physical activity, sleep, social club participation, chronic stress, blood lipid profiles, hypertension, diabetes, and family history of CVDs. An interaction term between diet quality and SEP was further added test their interaction.

RESULTS

With a median follow-up of 7.4 years, 2827 (3.4%) non-fatal CVD cases were identified. Diet quality was associated with CVD risk: Quartile 1 (poorest diet quality) vs Q4 (best/ref) HR 1.18 (95%CI 1.05-1.32). Education (but not income) modifies the associations between diet quality and incident CVDs (P-interaction=0.019), indicating stronger associations in lower education groups. Stratified by education group, HRs (95%CIs) for incident CVDs comparing diet quality Q1(poorest) to Q4(best) were 1.26(1.06-1.51) in low, 1.22(1.01-1.46) in middle, and 0.93(0.72-1.20) in high education group. Analysis of a composite outcome of non-fatal CVD cases and all-cause mortality (considering fatal CVD cases) yielded similar RESULTS.

CONCLUSIONS

SEP modifies the associations between diet quality and incident CVDs, with (stronger) associations in low/middle education groups. This result shows that diet quality is associated with disproportionate harm in lower SEP populations. This difference in the association between diet quality and incident CVDs across SEP groups contributed to health inequalities. Improving diet quality may have substantial potential and should be prioritized as a fundamental strategy to reduce socioeconomic inequalities in CVD burden in the population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP27_04

FACTORS ASSOCIATED WITH PROLONGED USE OF DONOR HUMAN MILK AT DA NANG HOSPITAL FOR WOMEN AND CHILDREN IN VIETNAM

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BACKGROUND AND OBJECTIVES

Donor human milk (DHM) from a human milk bank (HMB) is used to feed low birthweight (LBW) and preterm infants as the 'first alternative' when mothers are unable to provide their own milk. However, misuse of DHM could compete with mothers' own milk and weaken efforts to support breastfeeding. This study aimed to determine factors behind prolonged DHM usage by infants during the first six years of operation in the first HMB in Vietnam.

METHODS

Data on the characteristics and use of DHM by infants were extracted from the web-based digital monitoring system of the Da Nang HMB from 1 February 2017 to 31 January 2023. Prolonged use of DHM was defined as four days or more in neonatal units and two days or more in postnatal wards. Associated factors included birthweight, gestational age, and mode of birth.

RESULTS

In the first six years, 25,420 infants received DHM from the Da Nang HMB, with 45.3% being female and 54.7% male, 70.0% born via cesarean section, and 77.2% full-term. In the neonatal units (n = 7001), the average duration of using DHM was 3-4 days, and 38.0% used it for ≥ 4 days. Compared to those weighing 1500-<2000g, the adjusted odds ratios (aORs) were 0.14 for <1000g, 0.78 for 1000-<1500g, and 0.67 for ≥2000g ($p < 0.01$). Compared to gestational ages of 32-<34 weeks, the aORs were 0.26 for <28 weeks, 0.97 for 28-<32 weeks, 0.71 for 34-<37 weeks, and 0.35 for ≥37 weeks ($p < 0.01$). In postnatal wards (n = 18,419), the average duration of using DHM was 1-2 days, with 53.1% using it for ≥2 days. Compared to normal weight and term infants (≥2500g & ≥37 weeks), the aORs were 1.25 for LBW-preterm (<2500g & <37 weeks), 1.17 for LBW-term (<2500g & ≥37 weeks), and 1.21 for normal weight-preterm (≥2500g & <37 weeks) ($p < 0.05$ for all). Prolonged use of DHM was positively associated with cesarean births in neonatal units (aOR of 2.24, $p < 0.01$) and postnatal wards (aOR of 1.44, $p < 0.01$).

CONCLUSIONS

DHM in this hospital is used briefly to bridge nutritional gaps and transition to mothers' milk and breastfeeding. However, factors like LBW, preterm births, and cesarean births are linked to prolonged DHM use. These findings suggest the need for targeted interventions to optimize DHM use and transition to mothers' milk. Healthcare providers should not promote DHM as a substitute for breastmilk but offer support to those at risk of prolonged use. Reducing unnecessary cesarean births should also be prioritized.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP27_05

VALIDATION OF THE POLISH VERSION OF THE ORTO-R AMONG UNIVERSITY STUDENTS: COMPARISON WITH THE OTHER SCALES ASSESSING ORTHOREXIC THOUGHTS AND BEHAVIORS

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BACKGROUND AND OBJECTIVES

The ORTO-15 questionnaire and its shortened versions have been used most frequently in studies conducted over the past two decades on orthorexia nervosa (ON). Due to repeated criticism of their psychometric properties, a new version of ORTO-15 was developed, namely ORTO-R. The study's objectives were to confirm the factor structure of the Polish version of the ORTO-R, assess its internal consistency, provide evidence of validity, and compare it with other scales for assessing ON thoughts and behaviors.

METHODS

A cross-sectional quantitative study was conducted in 2021 among 478 university students. Eighteen universities from fourteen provinces in Poland participated in the study. The computer-assisted web interview (CAWI) technique was utilized to study with the Google Forms application. Participants were asked to complete the ORTO-R, the ORTO-15 and its shortened versions (ORTO-12, -11, -9, and -7), the Düsseldorf Orthorexia Scale (PL-DOS), the Three-Factor Eating Questionnaire (TFEQ-13), and the Mindful Eating Scale (MES).

RESULTS

The factor structure of the ORTO-R was confirmed, and the findings favor ORTO-R over the ORTO-15 regarding how the former was fitted to the data. Moreover, the ORTO-R was more internally consistent than the ORTO-15 and its shortened versions. The ORTO-15 and all its shortened versions correlated positively with awareness and act with awareness. Exclusively, the ORTO-R and the PL-DOS correlated negatively with awareness and act with awareness. The negative correlations were found between the ORTO-R, -9, PL-DOS, and acceptance. However, only for the ORTO-9, the correlation was weak (others were moderate). Only the ORTO-R correlated positively with cognitive restraint. Positive correlations were found between all used scales for assessing ON thoughts and behaviors and uncontrolled eating. However, only for ORTO-R and PL-DOS these correlations were moderate (others were weak). The ORTO-15, -11, and -7 correlated negatively with emotional eating, while the ORTO-R and the PL-DOS these correlations were positive. The findings support the argument that the ORTO-R was characterized by good convergent and criterion validity.

CONCLUSIONS

The ORTO-R is a valid and reliable scale to assess orthorexic thoughts and behaviors among Polish speakers. The ORTO-R better describes ON regarding eating behaviors than the original ORTO-15 and its shortened versions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP27_06

MULTIPLE MICRONUTRIENT SUPPLEMENTATION AND ITS IMPACT ON HUMAN MILK, SERUM SELENIUM AND INFANT GROWTH IN JOS, NIGERIA; A RANDOMISED CONTROL TRIAL

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BACKGROUND AND OBJECTIVES

Micronutrient deficiency which is commonly found among pregnant and lactating women. (1, 4) has significant deleterious impact on both the mother and child, especially in developing countries (2, 3). The study investigated the effect of Multiple Micronutrient Supplementation (MMS) on selenium levels in human milk and serum of lactating mothers' milk after 10 weeks of MMS supplementation.

METHODS

Sixty-six mother-infant pairs in Jos, Nigeria, were randomized to receive either MMS with 65 µg selenium or a placebo for 10 weeks. Breastmilk and serum samples were collected at baseline (≤5 days), week 6, and week 10. Maternal-infant data and selenium intake were assessed via a 24-hour dietary recall, with selenium levels analyzed using atomic absorption spectrophotometry and compared using descriptive and bivariate statistics ($P < 0.05$).

RESULTS

At baseline, mothers were aged 30.7±4.9 years (IG) and 29.0±5.6 years (CG), with weights of 72.6±10.7 kg and 69.2±10.4 kg, respectively. Infants weighed 3.1±0.4 kg in both groups. Selenium intake averaged 60.8±44.7 µg/day (IG) and 68.3±46.9 µg/day (CG), with 59% and 51% below the Estimated Average Requirement (EAR).

Impact of MMS on human milk and serum selenium

Serum/Human Milk Se	Intervention (µg/l)	Control (µg/l)	Total (µg/l)	P value
Serum baseline	185.1±23.3	184.5±23.4	184.7±23.2	0.93
6 weeks	101.1±4.7	103.9±4.8	102.6±4.9	0.03
10 weeks	84.9±2.7	83.2±1.7	84.1±2.4	0.02
Human milk baseline	223.2±16.5	214.29±14.4	220.2±16.1	0.16
10 weeks	129.8±5.0	129.1±6.3	129.5±5.6	0.70

At 6 weeks, stunting was observed in 9.38% of the control group but none in the intervention group ($p = 0.248$). Underweight and wasting were 4% and 24% in the intervention group versus 6.25% and 18.75% in the control group ($p > 0.05$). By 10 weeks, underweight rates were 3.7% (IG) and 3.45% (CG), while wasting rates were 36% (IG) and 31.03% (CG), with no significant differences ($p > 0.05$).

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CONCLUSIONS

Serum and human milk selenium levels declined significantly in both groups, with higher serum selenium at 10 weeks in the group on MMS ($p = 0.02$). Despite dietary selenium inadequacy, no significant differences in infant stunting, underweight, or wasting were observed. Longer MMS supplementation during lactation warrants further study.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP27_07

INTEGRATING PERSONALIZED NUTRITION AND SUSTAINABLE DIETARY PATTERNS: A LIFE CYCLE ASSESSMENT APPROACH TO ACHIEVING HEALTH AND ENVIRONMENTAL SUSTAINABILITY

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BACKGROUND AND OBJECTIVES

With growing environmental concerns and the rise of lifestyle-related health issues, there is a pressing need to transform food systems and re-evaluate dietary patterns to protect both human health and planetary sustainability. This study proposes an integrated approach that combines personalized nutrition with sustainable dietary patterns, utilizing life cycle assessment (LCA) to assess the environmental impacts of various diets. The goal is to promote diets that align with personal well-being while contributing to the Sustainable Development Goals (SDGs).

METHODS

This multidisciplinary approach includes:

1. **Life Cycle Assessment (LCA)**: Mapping the carbon, water, and land footprints of different diets worldwide.
2. **Literature Review**: Reviewing existing research on the environmental impacts of diets and the role of personalized nutrition.
3. **Fieldwork**: Collecting primary data on dietary practices, environmental impacts, and health outcomes.
4. **Personalized Nutrition Model**: Developing a model for tailoring dietary recommendations based on genetic, phenotypic, and behavioral factors, aligned with LCA insights.
5. **Policy Implications**: Exploring policy recommendations to guide stakeholders in adopting sustainable dietary practices.

RESULTS

Preliminary RESULTS show significant differences in the environmental impacts of various dietary patterns, with plant-based diets having lower footprints compared to animal-based diets. Early findings also suggest that personalized nutrition can improve adherence to sustainable diets by aligning individual health goals with environmental benefits.

CONCLUSIONS

This study highlights the potential of combining personalized nutrition with sustainable dietary patterns to promote both health and environmental sustainability. Further research into policy implications will help guide effective transitions to sustainable food systems aligned with the SDGs.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP27_08

PREGNANCY AND VITAMIN D INTERVENTION (PREDIN) – A RANDOMIZED DOUBLE-BLIND CONTROLLED TRIAL IN PREGNANT WOMEN AT HIGH RISK OF VITAMIN D DEFICIENCY

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BACKGROUND AND OBJECTIVES

One in ten pregnant women in Sweden has been found to be vitamin D deficient. Even so, a nationwide screening and vitamin D supplementation programme is not part of routine antenatal care. We aimed to evaluate the effects of vitamin D supplementation on vitamin D status in pregnant women at risk of vitamin D deficiency.

METHODS

The Pregnancy and Vitamin D Intervention (PREDIN) study is a three-arm, randomized, double-blind, controlled trial conducted in Gothenburg, Sweden, as part of routine antenatal care. Women (n=135) were recruited between April 2022 and February 2024. Screening for risk of vitamin D deficiency (25-hydroxyvitamin D, 25OHD <30 nmol/l) was done using a validated non-invasive screening tool consisting of five questions on vitamin D exposure in the first trimester. Based on the RESULTS from the screening tool, participants (n=99) at high risk of vitamin D deficiency (scores ≥15 points) were randomized to receive either usual antenatal care or daily supplementation with 20 or 40 µg/day of vitamin D3 throughout their pregnancy. The follow up visit was conducted in the third trimester. Background characteristics and blood samples for 25OHD analysis were collected at both the screening and follow up visit. The differences in maternal characteristics between the three study arms at baseline were tested by one-way ANOVA or chi-square test. The primary outcome is the difference between the three study arms in maternal 25OHD changes from the first to third trimester (will be analysed by liquid chromatography-mass spectrometry).

RESULTS

The primary outcome will be presented at the conference. Mean screening tool scores in the three arms were 28.3, 28.8, and 28.4 (p=0.973). Mean age was 30.7, 30.7, and 31.0 years (p=0.916), and mean BMI in first trimester was 26.4, 26.0, and 26.4 kg/m2 (p=0.977). Overall, 80% were born outside of Sweden, 40% had university level education, 28% were first-time mothers, and 48% reported use of vitamin D supplements at screening. There were no statistically significant differences between the three arms regarding continent of origin (p=0.458), education level (p=0.953), nulliparity (p=0.483), or use of vitamin D supplements at screening (p=0.932).

CONCLUSIONS

There were no statistically significant differences between the three study arms regarding maternal characteristics at baseline. The main RESULTS of the study will contribute to the evidence regarding the impact of vitamin D supplementation on 25OHD levels in pregnant women at risk of vitamin D deficiency.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP27_09

HEALTHY DIETS ARE ASSOCIATED WITH LOWER DEPRESSION, ANXIETY, AND STRESS IN LOW- AND MIDDLE-INCOME COUNTRIES: A META-ANALYSIS FROM A SYSTEMATIC EVIDENCE AND GAP MAP

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BACKGROUND AND OBJECTIVES

We aimed to examine the association between healthy diets and mental health (MH) in low- and middle-income countries (LMIC), because less is known about the interplay between diet and MH in LMIC compared to high income countries.

METHODS

We used a systematic Evidence and Gap Map (EGM) of peer-reviewed, English language studies (published 2000-2024; n»3055) to select studies for meta-analysis. We pooled effects from studies linking 'healthy' dietary patterns to depression, anxiety and stress. Comparable measures of 'Healthy' diets included adherence and adequacy, dietary patterns, diet diversity and diet quality indices. Random effects models with a Fisher r-to-z transformed correlation coefficient (Coeff.) were fitted for each MH group (depression, anxiety, and stress). We examined heterogeneity among studies, influential outliers and risk of bias.

RESULTS

84 studies from the EGM examined healthy diets against depression (n=71), anxiety (n=44), and stress (n=27). Most studies were cross-sectional (n=71), used factor analysis to ascertain dietary patterns (n=27), followed by diet indices (e.g., MedDiet; n=23), dietary quality (n=19), dietary diversity (n=15), and adherence measures (n=2). Most studies were from upper middle-income countries (n=69), and Asia (n=70). We found that healthy diets were consistently associated with less depression (Coeff. -0.14 (95% CI: -0.16 to -0.11), despite high heterogeneity (Coeff. ranging from -0.70 to 0.10). Healthy diets were also associated with lower anxiety (Coeff -0.12, 95% CI: -0.15 to -0.09), as well as lower stress (Coeff -0.12, 95% CI: -0.15 to -0.08; Coeff. range of studies: -0.43 to 0.08). Even though RESULTS were heterogeneous, they were not considered influential to the overall RESULTS. There was no observed publication bias or small study bias.

CONCLUSIONS

Healthy diets are linked to less depression, anxiety, and stress. These first-ever pooled estimates highlight evidence gaps in low-income countries outside of Asia. They can inform intervention gaps such as multiple marginalizations that heighten health risks, and furthermore encourage multisectoral policies and programs that improve both diet quality and mental health.

CONFLICTS OF INTERESTS

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OAP 31 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP31_01

COSTS OF MANAGING MALNUTRITION IN INFANTS UNDER 6-MONTHS (MAMI) IN ETHIOPIA: A COST-CONSEQUENCE ANALYSIS OF RANDOMISED CONTROL TRIAL DATA

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BACKGROUND AND OBJECTIVES

Malnutrition is a major global health concern, particularly in infants aged under 6-months (infants u6m) (1, 2). The Management of small, nutritionally At-risk Infants u6m and their Mothers Care Pathway (MAMI-CP) is a behavioural tool which aligns with 2023 WHO malnutrition guidelines. It helps healthcare workers better identify, counsel and care for malnourished infants. To support future international rollout of the MAMI-CP, our project aims to provide evidence around economic evaluation and programme implementation costs (3).

METHODS

We conducted a cost-consequence analysis alongside a randomised control trial in Ethiopia using a disaggregated societal perspective (including health services and household perspectives) to determine the cost of MAMI-CP per child over a 6-month period. Sensitivity analysis was performed using a best- and worst-case scenario framework. Lifetime societal costs were estimated using the Cost of Not Breastfeeding Tool to assess the long-term impacts of improved breastfeeding.

RESULTS

The cost of MAMI-CP to society is approximately US$135.80 per child (best- and worst-case scenarios: US$12.49; US$718.84), with health services contributing US$99.27 (US$6.12; US$644.44) and households contributing US$36.53 (US$6.37; US$74.40). This compares to the standard-of-care, which costs US$99.37 per child (US$7.23; US$503.55), comprising US$68.77 in health services (US$3.47; US$444.61) and US$30.60 in household costs (US$3.76; US$58.94). Higher costs in MAMI-CP are largely due to increase resource utilisation (increased clinic visits for counselling and support). Key benefits of MAMI-CP include improved exclusive breastfeeding rates, with mixed effects on anthropometry (improved mid-upper-arm circumference but no statistically significant change in other anthropometric measures; potentially different effects in subgroups). Long term, the intervention could reduce societal costs to the economy up to US$833,337,100 (US$6.43 per person) from improved breastfeeding.

CONCLUSIONS

While MAMI-CP incurs greater short-term costs than the standard-of-care, its potential health benefits, particularly in breastfeeding improvement, may justify these costs. Further research is needed to explore its scalability and long-term impacts.

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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP31_02

EFFECTS OF A TAILORED PROGRAMME TO SUPPORT FOOD COMPANIES TO REFORM NUTRITION POLICIES AND PRACTICES (REFORM): A MULTICENTRE, CLUSTER-RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Many governments rely on voluntary industry actions to improve population nutrition, including voluntary front-of-pack nutrition labelling, food advertising standards, and food reformulation programmes. Research has shown that food companies vary considerably in their policies and practices on nutrition. We aimed to determine if a tailored nutrition support programme for food companies improved their nutrition policies and practices compared with control companies who were not offered the programme.

METHODS

132 major packaged food/drink manufacturers (n=96) and fast-food companies (n=36) were randomly assigned (2:1 ratio) to a 12-month tailored support programme or to the control arm (no intervention). The intervention programme was designed and delivered by public health academics and comprised regular meetings, tailored company reports, and resources and recommendations to encourage improved product composition through reformulation, nutrition labelling (e.g., adoption of Health Star Rating [HSR]) labels), responsible marketing, and improved nutrition policies and corporate sustainability reporting. The primary outcome was the nutrient profile (measured using HSR) of company food and drink products at 24 months. Secondary outcomes were the nutrient content (energy, sodium, total sugar, and saturated fat) of company products, display of HSR labels on packaged products, company nutrition-related policies and commitments, and engagement with the intervention.

RESULTS

88 eligible intervention companies (9,235 products at baseline) were invited to participate, of whom 21 accepted and were enrolled in the REFORM programme (delivered September 2021 to December 2022). 44 companies (3,551 products at baseline) were randomised to the control arm. At 24 months, the model-adjusted mean HSR of intervention company products was 2.58 compared to 2.68 for control companies, with no significant difference between groups (mean difference -0.10, 95% CI -0.40 to 0.21, p-value 0.53). A per protocol analysis of companies with no major protocol violation also found no significant difference (2.93 vs 2.64, mean difference 0.29, 95% CI -0.13 to 0.72, p-value 0.18). There were no significant differences between the intervention and control groups in secondary outcomes.

CONCLUSIONS

A 12-month tailored nutrition support for food companies did not improve the nutrient profile of company products.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP31_03

NUTRITIONAL EFFICACY OF READY-TO-USE THERAPEUTIC MEAL MADE FROM LOCAL INGREDIENTS FOR COMMUNITY MANAGEMENT OF ACUTE MALNUTRITION IN UNDER FIVE CHILDREN

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BACKGROUND AND OBJECTIVES

Ready-to-use therapeutic food (RUTF) is a specially formulated high protein and energy dense meal used to treat children over 6 months of age who are malnourished. The conventional imported RUTFs are often out of stock because of high cost. The aim of this study was to formulate RUTF with graded ratios of the locally sourced base ingredients – rice, soybean, ground nut, snail carrot, date palm, and vegetable oil.

METHODS

The WHO guideline and Pearson Square method for feed formulation were used in calculating the percentage each ingredient will contribute to the 3 experimental products. Rice, soybeans and groundnut served as the fixed ingredients supplying 15% protein; snail, carrot, date palm and vegetable oil were added to each formulation. Three products were formulated and coded RSG-RUTF-1, RSG-RUTF-2, and RSG-RUTF–3. The products were evaluated for energy and nutrient contents and sensory attributes using standard procedures. Data obtained were statistically analyzed using IBM-SPSS version 23 and presented in Tables as means and percentages.

RESULTS

The moisture content of the products ranged from 9.26 - 11.11%, protein 6.85 - 9.75%, fat 6.81 - 26.49%, crude fiber 2.39 - 2.79%, ash 0.99 - 1.07% and carbohydrate 50.22 - 71.01%. The vitamins A (1.14 -1.33mg), and E (20.20 – 20.27mg) and sodium (5.55 – 6.02mg) were within the recommended levels for RUTF, iron (0.68 – 0.85mg), potassium (16.22 – 24.24mg), copper (0.00 – 0.01mg), magnesium (4.27 – 5.22mg) and zinc (0.01 – 0.06mg) were slightly low. However, the energy content of the products ranged from 374Kcal in RSG-RUTF-2 to 478Kcal in RSG-RUTF-3 was adequate. There were significant ($p<0.05$) differences among the products for taste, texture and general acceptability. The RSG-RUTF-3 had the highest general acceptability score (7.17± 0.25).

CONCLUSIONS

The nutritive values of formulated RUTFs were within the standards recommended for complementary feeding as well as meet the culinary requirement of the local community. They compared favourably with other locally made RUTFs; therefore have high potential for being adopted for the management of SAM and CMAM in children.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP31_05

IMPACT OF LOCALLY MADE READY-TO USE THERAPEUTIC FOOD ON THE WEIGHT AND MID UPPER ARM CIRCUMFERENCE OF THE ACUTE MALNOURISHED CHILDREN ADMITTED IN THE PAEDIATRIC WARD OF A FEDERAL UNIVERSITY TEACHING HOSPITAL, IN ABAKALIKI, EBONYI STATE

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BACKGROUND AND OBJECTIVES

Imported conventional ready-to-use therapeutic foods (RUTFs) have been shown to be effective in the nutritional rehabilitation of malnourished children but shipping costs, delays, and donor fatigue result in periodic unavailability of supplies in the hospitals thereby undermining their effectiveness. The use of locally made RUTFs is therefore, being advocated for the rehabilitation of malnourished children in developing countries. The aim of the study was to determine the impact of RUTF made from local ingredients on weight and mid upper arm circumference (MUAC) status of moderate acute malnourished (MAM) children (6 –59 months) admitted in a federal university teaching hospital.

METHODS

Three RUTFs were formulated using the WHO guideline and Pearson Square method for feed formulation. The products which contained different ratios of the base ingredients - rice, soybean, and groundnut were coded RSG-RUFT-1, RSG-RUTF-2, and RSG-RUFT-3. Snail, date palm and vegetable oil were added to each formulation. The processing, chemical analysis, sensory evaluation, and ethical approval were carried out according to standard METHODS. Twenty children admitted in the paediatric ward of a federal university teaching hospital with MAM based on their MUAC measurements (11.5cm – 12.5cm) were randomly grouped into two groups of 10 subjects per group for the feeding trial. The weight and MUAC of the subjects were measured before and after the feeding trial using standard METHODS. The RUFT-3 (had better nutrient and sensory profiles than the other two formulated RUFTs) and a conventional imported RUTF (Plumpy nut) were fed the children for four weeks using the WHO ration guide. The Group 1 consumed conventional imported RUTF while Group consumed the formulated RUTF-3.

RESULTS

The Group 1 had 32.90% weight gain while Group 2 had 20.26%. The same trend was observed in the MUAC measurements; 14.98% and 11.63%, respectively. These differences were significant ($p < 0.05$).

CONCLUSIONS

The formulated RSG-3 which was prepared with local ingredients, was accepted the mothers/caregivers in all sensory attributes and it has the potentials of serving as alternative to the conventional imported RUTF if the protein content is increased.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP31_06

LONGITUDINAL GROWTH MODELS FOR INFANTS FROM THE MUMTA PREGNANT WOMEN TRIAL

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BACKGROUND AND OBJECTIVES

Maternal undernutrition is a major global contributor to low birth weight, small-for-gestational-age, and preterm births. This study aimed to investigate the impact of antenatal interventions on infant linear growth trajectories from birth to 12 months of age.

METHODS

Pregnant women (8–18.9 weeks gestational age (GA)) from the Mumta trial were randomly assigned (1:1:1:1) to one of four groups: control (standard antenatal care), Balanced Energy Protein supplementation (BEP), BEP plus Azithromycin (AZ), or BEP plus nicotinamide and choline (Nic/Chol). Broken-stick models approximated non-linear growth curves from birth to 12 months, while k-means clustering identified subjects with similar growth trajectories. Random effect models assessed the impact of interventions and covariates (maternal age, height, parity and mode of delivery) on growth outcomes. Analyses were conducted in R using relevant packages.

RESULTS

Pairwise comparisons of mean growth trajectories revealed that, compared to the control arm, the BEP+AZ arm exhibited higher mean WAZ scores from birth to 2 months and beyond 6 months, higher mean LAZ scores from birth to 6 months and beyond 11 months, and higher mean WLZ scores from birth to 2 months and beyond 7 months. The BEP+Nic/Chol arm demonstrated higher mean WAZ, LAZ, and WLZ scores at birth but not up to 12 months. Cluster analysis indicated that infants in the BEP+AZ arm had the highest membership in the thriving cluster across WAZ (control 70.4%, BEP+AZ 75.8%), WLZ (control 86.6%, BEP+ AZ 87.3%), and LAZ (Control 71.5%, BEP+AZ 75.8%) measures. Faltering growth, based on WAZ (Control 29.6%, BEP+AZ 24.1%) and LAZ (Control 28.3%, BEP+AZ 23.9%) trajectories, was lowest in the BEP+AZ arm, followed by the BEP+Nic/Chol arm. Mixed-effects modeling showed that infants in the BEP+AZ arm had a 17% reduced risk of underweight (95% CI 0.72-0.96) and 17% reduced risk of stunting (95% CI 0.69-0.90) compared to the control arm. Infants in the BEP+Nic/Chol arm had a 15% reduced risk of underweight (95% CI (0.75-0.97) vs control arm, only in unadjusted analyses (p = 0.018).

CONCLUSIONS

The combined effect of BEP and AZ on longitudinal growth trajectories was observed at birth, during the post-natal period, and in late infancy. In contrast, the combined effect of BEP with Nic/Chol was observed at birth but diminished by the one-year follow-up. Antenatal interventions, such as BEP supplementation and prophylactic AZ, may have the potential to support and sustain infant growth outcomes in low-resource settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP31_07

HOUSEHOLD USE OF IODINE-CONTAINING BOUILLON CUBES IMPROVES IODINE STATUS AMONG WOMEN AND CHILDREN IN NORTHERN GHANA: A SECONDARY OUTCOME ANALYSIS OF THE COMIT TRIAL

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BACKGROUND AND OBJECTIVES

Inadequate iodine status has severe negative consequences in women and children, including increased risk of hypothyroidism, impaired mental function, and goitre. Despite mandatory iodization of edible salt (MIES) in Ghana, a substantial proportion of households uses salt that is not iodized or adequately iodized. We aimed to evaluate the impact of household use of bouillon cubes containing iodine on iodine status among non-pregnant, non-lactating women of reproductive age (WRA) and preschool children (PSC) 2-5 y in northern Ghana.

METHODS

In this doubly-masked trial in the Kumbungu and Tolon districts, recruited participants underwent baseline assessments, and their households were randomly assigned to rations of bouillon cubes containing either (1) vitamin A, folic acid, vitamin B-12, iron, zinc and iodine, or (2) iodine only, with advice to use the study cubes in place of commercial cubes in typical cooking. Both types of bouillon provided an expected iodine (as potassium iodate) dose of 75 µg/d (30 µg/g, 2.5 g/d intake) or 50% of recommended dietary allowance (RDA) for WRA and 30 µg/d (30 µg/g, 1.0 g/d intake) or 33% RDA for PSC. Spot urine samples collected at baseline and after a 9-month intervention were analyzed for urinary iodine concentration (UIC) using the Sandell-Kolthoff method. We compared median UICs (µg/L) and the percentage of participants with UIC < 50 at each time point with World Health Organization (WHO) population median thresholds of UIC <100, 100–199, 200–299, and ≥300 reflecting deficient, adequate, slight risk of > adequate, and risk of adverse consequences, respectively, and goal of maintaining < 20% of samples with UIC < 50.

RESULTS

The analysis involved 1,005 WRA (mean age, 33 y) and 688 PSC (mean age, 3.4 y). Among WRA, median UIC (Q1, Q3) was 99.5 (55.3, 171.1) and 23.3% had UIC < 50 at baseline; both indicated a population with iodine deficiency. At endline, median UIC of WRA was 122 (71.4, 192) and only 14.6% had UIC < 50; both indicated a population with adequate iodine status. Among PSC, median UIC at baseline [109 (60.6, 193)] was within the WHO range for adequate iodine status, but 22.1% had UIC < 50 at baseline. At endline, median UIC was 135 (81.6, 241) and only 12.9% had UIC < 50; both indicated a population with adequate iodine status.

CONCLUSIONS

The baseline iodine status of WRA and PSC in the Kumbungu and Tolon districts was low despite MIES in Ghana. The intervention with iodine-containing bouillon cubes improved iodine status, but further research is needed to explore its potential role in supplying sufficient iodine in this and similar settings

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP31_08

DEFINING AND OPERATIONALISING FOOD KNOWLEDGE, NUTRITION KNOWLEDGE, NUTRITION LITERACY, AND FOOD LITERACY: A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES

Existing definitions of Food Literacy (FL) and Nutrition Literacy (NL) differ within the current scientific literature, and there is a lack of consistent definitions for Food Knowledge (FK) and Nutrition Knowledge (NK). These discrepancies complicate efforts to assess and improve nutrition-related competencies in educational settings. This scoping review aims to establish distinct definitions for these domains and to derive respective sets of indicators applicable to formal educational contexts.

METHODS

A scoping review will be conducted to identify and synthesise existing definitions for the four domains. Based on these findings, standardised definitions will be developed, and corresponding sets of indicators to operationalise assessments within these domains will be derived. These indicators will consider cognitive demand levels (Level 1: Reproduction of Knowledge, 2: Reorganisation and Transfer, 3: Reflection and Problem Solving) and will be derived from relevant literature, such as Bloom's Taxonomy.

RESULTS

Preliminary RESULTS indicated that FK solely establishes a theoretical knowledge and understanding of food-related concepts (e.g. sources, production, and cultural factors of foods), while NK includes a theoretical knowledge of nutrients and their roles in health. Conversely, NL translates FK and NK into practical skills (e.g. interpretation of nutrition labels, meal preparation) while FL builds on FK, NK, and NL, integrating a systemic perspective by considering cultural, social, and environmental factors. Building on these definitions, indicators operationalising assessment for each domain were derived (e.g. "*name* food types" for FK, "*describe* functions of nutrients" for NK, "*interpret* nutrition labels" for NL, "*reflect* and *evaluate* how dietary-related choices influence others" for FL).

CONCLUSIONS

This structured set of standardised definitions for essential nutrition-related domains supplemented by operationalising indicators will facilitate consistent categorisation and evaluation of studies focused on nutritional competencies in educational contexts such as schools. This scheme will assist in evaluating nutritional competencies among teachers and students, thereby advancing nutrition education.

CONFLICTS OF INTERESTS

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OAP 32 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP32_01

ANEMIA, IRON INTAKE, AND FERRITIN AMONG ADOLESCENTS WITH OBESITY

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BACKGROUND AND OBJECTIVES

Anemia is one of health consequences of obesity. With increasing rate of obesity with even younger age of onset, this raises health concerns about health burdens among those with obesity. Obesity can impact iron status through mechanisms such as chronic inflammation, altered iron absorption, and increased hepcidin levels. Obese adolescents may exhibit lower levels of iron stores, despite having higher body mass, due to disrupted iron homeostasis associated with adipose tissue inflammation. Additionally, the presence of comorbidities commonly seen in obesity, such as insulin resistance and metabolic syndrome, can further exacerbate the risk of anemia by affecting erythropoiesis and red blood cell production. The objective of this study is to investigate the rate of anemia among adolescents with obesity using hemoglobin levels, iron storage and intake of iron-rich dietary intake among these individuals.

METHODS

A cross-sectional study was conducted in 482 adolescents aged 14-18 years, out of which 231 were with obesity. Data on anthropometric measure and dietary intakes were collected. Blood samples were analysed for complete blood count. Out of 231, 84 adolescents had their plasma ferritin analysed for a marker of iron storage. Prevelance of anemia was calculated based on hemoglobin levels (cut off 13 g/dL for anemia in adolescents). Prevalence of low iron storage was calculated based on ferritin levels < 20 ng/mL. The association between iron-rich dietary intake was examined using a generalised linear model.

RESULTS

Prevalence of anemia was 13% (n=31/231) with an average hemoglobin levels of 15 g/dL. Despite this finding, iron intake among this population was low averaging at 9 mg/day. Daily recommendation for adolescents is between 11-15 mg/day. Furthermore, low ferritin levels was detected in 47/84 (56%). This shows that although anemia is clinically detected, iron storage which is the first sign of iron depletion starts to appear. Although not significant, this may be due to relatively low iron-rich food intake.

CONCLUSIONS

This study shows that although anemia was not of high prevalence among adolescents with obesity, trends of low iron-rich food intake and low iron storage measured by ferritin levels was evident. Further study is necessary to investigate other biomarkers of anemia other than hemoglobin that are reflective of iron metabolism disruption in adolescents with obesity.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP32_02

ULTRA-PROCESSED FOOD CONSUMPTION AND BMI, WEIGHT GAIN AND OVERWEIGHT IN YOUNG CHILDREN IN THE NETHERLANDS: THE GECKO DRENTHE BIRTH COHORT

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BACKGROUND AND OBJECTIVES

Ultra-processed foods (UPFs) are related to increased risk of overweight and obesity in adults and have received increasing attention in recent years. Since less is known about this association in children, this study aimed to assess the association between UPF consumption at age 3 years and the BMI, increase in BMI and overweight/obesity at age 10-11 years in Dutch children.

METHODS

Of 1091 children (50.2% male) from the Dutch GECKO Drenthe study, dietary intake was assessed using a validated 71-item Food Frequency Questionnaire (FFQ) at age 3 years. Food items were categorized according to the NOVA classification system and the proportion (weight ratio, %) of UPF (NOVA-4) in the total food weight per day was calculated. Height and weight were measured by trained nurses and used to calculate BMI Z-scores and change in BMI-z between 3 and 10/11 years of age, normalized for age and gender. Overweight/obesity was defined by IOTF criteria. Regression models were adjusted for potential confounders, including age, sex, total energy intake, BMI z-score at age 3 years, maternal factors (BMI, education level, smoking status) and the presence of siblings.

RESULTS

The mean ± SD UPF intake at age 3 years was 786 ± 310 g/d (52% of total weight of food intake). The intake of unprocessed and minimally processed foods, processed culinary ingredients, and processed foods accounted for 42%, 1%, and 5%, respectively, of total weight of food intake. The prevalence of children with overweight/obesity at 10/11 years was 16.2%. The top three UPF food categories consumed were sugary beverages, sugary dairy products, and carbohydrate-rich staple foods (including bread, cereal, fries, muesli and porridge). Children in the highest quartile of UPF consumption demonstrated a higher BMI z-score at age 10-11years ($\beta = 0.16$; 95% CI: 0.01 to 0.31; $P < 0.001$) and a greater increase in BMI z-scores from ages 3 to 10/11 years ($\beta = 0.16$; 95% CI: 0.01 to 0.31; $P < 0.001$) compared with those in the lowest quartile, independent of total energy intake and other confounders. No significant association was observed between UPF consumption and overweight status at age 10/11 years.

CONCLUSIONS

Higher UPF intake at age 3 years was associated with a greater increase in BMI z-scores and higher BMI z-scores at age 10/11 years. This study suggests that a high UPF intake in early childhood may contribute to long-term weight gain, emphasizing the importance of dietary habits in early life.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP32_03

ASSOCIATION BETWEEN IYCF PRACTICES AND INDICATORS OF GROWTH AND MICRONUTRIENT STATUS IN CHILDREN AGED 06-23 MONTHS: FINDINGS FROM COMPREHENSIVE NATIONAL NUTRITION SURVEY 2016-2018

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BACKGROUND AND OBJECTIVES

Inadequate Infant and Young Child Feeding (IYCF) practices are key factors contributing to undernutrition, particularly during the critical stages of early development. Addressing these practices is crucial for preventing adverse health outcomes. This study explores the relationship between Minimum Dietary Diversity (MDD), Minimum Acceptable Diet (MAD), and the nutritional status such as stunting, wasting and micronutrient status such as Anemia, Iron Deficiency and Zinc Deficiency of children aged 0-23 months.

METHODS

The study analyzed Comprehensive National Nutrition Survey (CNNS) 2016–2018 data, employing a multi-stage design with structured interviews, IYCF practices, anthropometric measurements, and biochemical indicators. Descriptive statistics were used to determine IYCF indicators, and the prevalence of stunting, wasting, and micronutrient deficiencies. The BRINDA approach accounted for inflammation in assessing iron and zinc deficiencies. Multivariate logistic regression, with adjusted odds ratios, explored the association between IYCF practices and the nutritional and micronutrient status of children aged 0–23 months, controlling for potential confounders.

RESULTS

The study revealed that only 24.9% of children met the MDD, and 44.4% followed the recommended minimum meal frequency. Additionally, only 12.3% of children met the criteria for MAD. Stunting was observed in 22.79% of the children, while 15.69% were affected by wasting. Anemia is the most prevalent condition, with a rate of 43.3%. Iron deficiency affected 48.33% of children, and zinc deficiency was present in 16.51%. Logistic regression analysis showed that meeting MDD was associated with a lower likelihood of stunting (AOR: 0.82, $p=0.002$) but did not show a significant link to wasting. Age was a strong predictor of stunting, especially in children aged 12-23 months (AOR: 3.18, $p<0.001$), while female children had lower odds of both stunting (AOR: 0.70, $p<0.001$) and wasting (AOR: 0.88, $p=0.045$). However, MDD and MAD was not significantly associated to any of the selected micronutrient deficiencies.

CONCLUSIONS

In conclusion, the study highlights the significance of dietary diversity and meal frequency in reducing stunting. Comprehensive interventions addressing socioeconomic inequalities, maternal education, and nutrient-based strategies are crucial. Empowering caregivers with knowledge and resources to provide diverse, nutrient-dense foods is essential for improving child nutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP32_04

DETERMINATION OF LIVER MARKERS OF CHICKEN EXPOSURE TO POLYCHLOROBIPHENYLS (PCBS) BY 1D AND 2D NMR-METABOLOMICS

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BACKGROUND AND OBJECTIVES
In order to enhance food safety surveillance, sector players must benefit high-throughput, low-cost screening METHODS to control critical points in the food chain. One of the approaches proposed by the ANR SENTINEL project consists of combining the discovery and identification of food chain contamination markers by "omics" techniques with targeted high-throughput and cost-effective techniques in order to easily and quickly measure these markers in animal tissues or fluids. To do this, based on a case study (exposure of chickens to ultra-trace levels of PCBs), we explored the potential of NMR spectroscopy to identify hepatic markers of exposure of chickens to ultra-trace levels of contaminants (here PCBs). To overcome the limitations of 1D NMR for the identification and quantification of biomarkers, the interest and performance of 2D NMR has been evaluated using several fast 2D sequences.
METHODS

Following a Bligh and Dyer extraction, aqueous and lipidic extracts of liver samples from chickens exposed to low doses of PCBs in the feed for 45 days (Aroclor 1260 2 µg/kg/day, 20 µg/kg/day, 100 µg/kg/day) were analyzed by 1D proton NMR and 2D NMR sequences on a 600 MHz NMR spectrometer. Multivariate statistical analyses (PCA and PLS-DA analyses) were performed on NMR data to differentiate control and exposed animals

RESULTS
Our preliminary RESULTS on one-dimensional proton NMR data showed different lipidic profiles between control animals and the three groups of exposed animals despite low exposure doses. For polar metabolites, we observed differences between control and treated animals only for the lowest exposition dose. Work is now in progress for the identification of discriminant metabolites. 2D NMR spectra showed an improved peak separation compared to 1D NMR spectra. The various 2D datasets are undergoing treatment for statistical analyses, and already show powerful capacities.
CONCLUSIONS
These preliminary RESULTS obtained by 1D NMR metabolomics are encouraging, notably by revealing lipidic metabolism disturbances despite very low doses of exposure to PCBs. The statistical analyses on the 2D NMR data will continue with the aim of highlighting additional discriminant metabolites. Our preliminary RESULTS already demonstrate the added-value of 2D NMR for improving metabolite separation and identification capabilities. Our innovative methodology paves the way to the development of new solutions for efficient food monitoring
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP32_05

EFFECTS OF EXOGENOUS NUCLEOTIDES SUPPLEMENTATION ON SYMPTOMS, RECOVERY, AND IMMUNE RESPONSE IN ELDERLY COVID-19 PATIENTS

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BACKGROUND AND OBJECTIVES

The COVID-19 pandemic exposed the vulnerability of the elderly to infections due to immunosenescence. Nucleotides(NTs), essential for immune modulation, may enhance recovery and resilience. This study examines their effects on symptoms, recovery, and immunity in elderly COVID-19 patients, offering insights for broader applications in aging populations.

METHODS

This study is a subgroup analysis of a randomized, double-blind, placebo-controlled trial conducted in Chengdu, China (Clinical Trial Registration No.: NCT05243108). Elderly participants aged 60–70 were randomly assigned in a 1:1 ratio to receive either nucleotides (1.2 g/day) or a placebo, based on a computer-generated randomization sequence. Elderly participants who contracted COVID-19 after 1.5 months of nucleotides or placebo supplementation were included. Acute-phase symptoms were assessed at infection onset, and recovery was evaluated 4 weeks post-infection. T lymphocyte subsets in peripheral blood were analyzed using flow cytometry, and serum cytokines (TNF-α, IL-6, and others) were measured using QAH-CUST chip technology.

RESULTS

A total of 56 elderly COVID-19 patients (27 in the nucleotides group, 29 in the placebo group) were included.（1）Acute Phase: Symptom prevalence (e.g., cough, fever, sore throat) and duration (8.11±4.27 vs 7.97±3.49 days) showed no significant differences between groups.（2）Recovery Phase: Persistent symptoms (e.g., night sweats, nasal congestion, cough) were less frequent in the nucleotide group (3.70%, 11.11%, 40.74%) compared to the placebo group (27.59%, 20.69%, 65.52%; P=0.015, P=0.055, P=0.063).（3） Immune Response:CD4+ T lymphocyte levels increased in the nucleotide group (2.01 ± 3.59) but decreased in the placebo group (-0.35 ± 4.35, P=0.031). CD8+ T lymphocytes declined more in the nucleotide group (-2.95 ± 2.94) than in the placebo group (-0.41 ± 3.12, P=0.003). Serum IL-6 and TNF-α levels were significantly lower in the nucleotide group (P=0.045, P=0.005).

CONCLUSIONS

Exogenous nucleotides supplementation enhances immune function and recovery in the elderly by reducing persistent symptoms, boosting CD4+ T lymphocytes, and lowering inflammatory cytokines. It shows potential as an immunonutrition strategy to support health and resilience against future infections.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP32_07

DIET QUALITY AND HEALTH AMONG FIRST NATIONS IN CANADA: INSIGHTS FROM THE HEALTHY EATING FOOD INDEX (HEFI-2019) AND CANADIAN HEALTHY EATING INDEX (C-HEI 2007)

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BACKGROUND AND OBJECTIVES

Diet quality is a key determinant of health, yet little is known about its relationship with health outcomes in First Nations communities, the largest group among Indigenous peoples in Canada, where historical and ongoing inequities have shaped dietary practices and influenced health outcomes with a sharp increase in chronic disease rates. This study evaluates diet quality using the Healthy Eating Food Index-2019 (HEFI-2019) and the Canadian Healthy Eating Index 2007 (C-HEI 2007) and explores associations with obesity, type 2 diabetes (T2D), and self-perceived health among First Nations adults.

METHODS

Data were drawn from the First Nations Food, Nutrition, and Environment Study (FNFNES), a 10-year community-based participatory research project encompassing dietary recalls, sociodemographic surveys, and health assessments of 6487 adults (19 years and older) from ninety-two First Nations communities across Canada. HEFI-2019 and C-HEI 2007 scores were calculated and analyzed for associations with health outcomes using regression models adjusted for demographic and lifestyle covariates.

RESULTS

Mean HEFI-2019 and C-HEI 2007 scores were 35/80 and 49/100, respectively, indicating suboptimal adherence to dietary guidelines compared to the Canadian population. Factors such as region, age, sex, education level, number of working people in the household, and smoking status significantly influenced diet quality. Traditional food consumption was significantly associated with improved diet quality, increasing scores by 5 points for both indices. Higher scores for both indices were significantly associated with increased odds of T2D, likely reflecting dietary improvements following diagnosis. No significant associations were found between diet quality and obesity or self-perceived health.

CONCLUSIONS

These findings underscore the complexity of diet quality's relationship with health outcomes, shaped by socioeconomic and structural factors. Traditional food consumption plays a pivotal role in enhancing diet quality among First Nations, reflecting its nutritional and cultural significance. While higher diet quality may follow a T2D diagnosis, culturally tailored interventions are essential to support traditional food systems, promote dietary practices, and advance health equity in Indigenous communities.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP32_09

EFFICACY OF ZINC BIOFORTIFIED RICE IN IMPROVING ZINC STATUS AMONG YOUNG NON-PREGNANT NON-LACTATING WOMEN IN RURAL BANGLADESH: A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Zinc biofortified rice (ZBR) can be a suitable approach for alleviating zinc status in Bangladesh, a country where zinc deficiency (ZD) is a public health problem. Habitual diet in Bangladesh is dominated by plant-source food with rice being the staple. Non-pregnant non-lactating (NPNL) women are more affected (57%) by ZD and bear more severe consequences owing to their reproductive life. A previous trial with ZBR among children failed to elicit any positive impact, mostly due to methodological and analytical limitations. Therefore, we decided to conduct a randomized controlled trial (RCT) among young NPNL women in rural Bangladesh with more robust methodologies to assess the efficacy of ZBR in increasing plasma zinc concentration (PZC) and improving morbidity.

METHODS

We are currently conducting a community-based, double-blind RCT among young NPNL women aged 20-29 years in the rural area of Birganj, Dinajpur, Bangladesh. We listed 3425 households in the study area and identified 359 eligible females; i.e. aged 20-29 years, neither pregnant nor lactating, apparently healthy, had not consumed micronutrient supplementation in the preceding three months and not a recipient of rice supply through social safety net program. From this sampling frame, 200 women were selected and assigned to either one of ZBR (BRRI-100 variety) or conventional rice (CR, BRRI-29 variety) arms by simple random sampling. The enrolled participants would receive a supply of raw rice for their whole family for a duration of two months. Data and venous blood samples are collected before and after intervention. Outcomes of interest are PZC and self-reported morbidity during the intervention period. Participants' compliance to the intervention is monitored every three days using pictorial cards and standard serving bowls. Habitual dietary intake of various nutrients will be estimated by a validated 7-day semi-quantitative food frequency questionnaire (SQ-FFQ) during baseline and endline surveys. The trial has been registered at ISRCTN with the registration number ISRCTN83005630.

RESULTS

Currently, we are conducting the end-line survey of the recruited 197 participants (A=98, B=99). The RESULTS of the final analysis will be presented during the conference presentation

CONCLUSIONS

Given our robust methodology, the RESULTS of this study will provide conclusive evidence regarding the efficacy of zinc-biofortified rice in improving zinc status among NPNL women in rural Bangladesh.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 35 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP35_02

ROAD MAP FOR INTEGRATING SPECIALIZED LACTATION COUNSELING SERVICES INTO THE JORDANIAN HEALTH SYSTEM

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BACKGROUND AND OBJECTIVES

The rate of exclusive breastfeeding (EBF) in Jordan has remained stagnant for the past 20 years. At 24%, it is one of the lowest rates globally. Persistent barriers to EBF in Jordan include traditional practices and norms and lack of institutionalized quality lactation counseling services to support pregnant and lactating women (PLW). Evidence shows that programs which provide support through lactation counselors (LCs) are effective in improving breastfeeding initiation, duration and rates of EBF. In response to this, the USAID funded Community Health and Nutrition (CHN) Activity developed and implemented a national Lactation Counselors Certification Program (LCCP) to create a cadre of LCs integrated within the health care system.

METHODS

CHN designed a national LCCP responsive to Jordan's needs and priorities. The process included revisions to the International Board-Certified Lactation Counsellors (IBCLC) program, the Academy of Lactation Policy and Practice programs, and regional initiatives. The program collaborated with the Ministry of Health, the Health Care Accreditation Council, and other national experts. Design of the certification pathway built on localized best practices for health care professionals to ensure integration of LC services across the health care system with a focus on strong linkages with the community and long-term sustainability. The LCCP comprises a capacity building program, including classroom training with clinical practices and supervised on- the -job practicum across the continuum of care and practical tools to mentor, supervise and document learnings.

RESULTS

The first national LCCP was launched in 2022. As of December 2024, 83 LCs were certified and have provided services to more than 8,000 PLW across Jordan. To ensure sustainability of this program, CHN advocated with the National Medical Councils securing the LCCP the maximum number of continuous professional development hours required for professional relicensing. Additionally, CHN partnered with a private insurance company to integrate LC services within their medical service package.

CONCLUSIONS

Investing in the design and adaptive roll out of a dynamic LCCP for the first time in Jordan ensures PLW can access affordable quality lactation counselling support via public and private health care systems with linkages to the community, aiming to improve future breastfeeding and nutrition outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP35_03

SYSTEMATIC REVIEW ASSESSING THE IMPACT OF PRENATAL MULTIPLE MICRONUTRIENT SUPPLEMENTATION VS IRON AND FOLIC ACID SUPPLEMENTATION ON INFANTS' SIZE AT BIRTH AND SUBSEQUENT GROWTH THROUGH 2 YEARS OF AGE

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BACKGROUND AND OBJECTIVES

While antenatal multiple micronutrient supplements (MMS) have been shown to improve pregnancy outcomes compared to iron and folic acid supplements (IFA), their impact on infant growth up to 2 years of age remains unclear. We performed a systematic review of trials comparing antenatal MMS vs IFA, evaluating their impact on infants' anthropometric outcomes at birth, three, six, 12, 18, and 24 months of age.

METHODS

We included trials from a Cochrane review along with new studies found through systematic searches in three databases. We calculated pooled effect estimates (with 95% CI) using a generic inverse variance method, applying both fixed and random effects. We conducted subgroup analyses comparing trials with supplementation in pregnancy vs. pregnancy and postpartum, and trials with lower (≤ 11.9%) vs higher prevalence (>11.9%) rates of low birthweight (LBW). We performed additional sensitivity analyses limited to the 16 trials included in the 2020 WHO recommendation. PROSPERO registration number: CRD42024551864.

RESULTS

19 trials were included. Compared with IFA, MMS led to significantly greater length and weight from birth to six months, larger head circumference (HC) from birth to 12 months, and a greater mid-upper arm circumference (MUAC) at birth. Infants of mothers taking MMS vs IFA were significantly longer at birth (mean difference: 0.05 cm, 95% CI 0.02 to 0.08) and showed higher length-for-age Z-scores (LAZ) at birth (0.09, 0.06 to 0.12), three (0.09, 0.06 to 0.12) and six-months (0.04, 0.01 to 0.07), but not in subsequent follow-ups. MMS also resulted in significantly higher weight-for-age Z-scores and HC-for-age Z-scores from birth to six months, and higher weight-for-length Z-scores and MUAC-for-age-Z scores up to three months. MMS lowered the risk of stunting (RR 0.86, 95% CI 0.82 to 0.91), underweight (0.86, 0.81 to 0.90), small HC (0.84, 0.79 to 0.90), and low MUAC (0.90, 0.82 to 0.99) at 3 months, and reduced the risk of wasting (0.90, 0.85 to 0.96) at birth. For some outcomes, the effects of MMS vs IFA were greater among trials that continued supplementation post birth and those conducted in settings with higher prevalence of LBW. RESULTS were similar in the sensitivity analyses.
CONCLUSIONS

Antenatal MMS supplementation improved infant anthropometric outcomes at birth and during the first six months, but not thereafter. These findings further support the benefits of MMS beyond birth-related outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP35_04

HEME IRON FROM RED MEAT IS ASSOCIATED WITH FUNCTIONAL INTESTINAL DISORDERS IN THE FRENCH NUTRINET-SANTÉ COHORT

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BACKGROUND AND OBJECTIVES

Food-related intestinal disorders are common, especially in patients with irritable bowel syndrome (IBS), for whom exclusion diets may be proposed as part of symptom management. Although a particular attention has been paid to the relationship between the consumption of red meat and colorectal cancer, its role in functional intestinal disorders and abdominal pain is unknown. Heme iron contained in red meat was indeed shown to catalyze the peroxidation of dietary polyunsaturated lipids in the gut lumen, leading to the formation of reactive aldehydes, associated to colorectal cancer promotion in rodent1, but also activating pain signaling pathways2. Our objective was to investigate the association between red meat consumption and the risk to encounter functional intestinal disorders.

METHODS

Participants (n=77,128, mean age: 44.5 years, 77.7% women) were adults from the French prospective cohort NutriNet-Santé (2009-2022). Meat consumption (overall and by types) was assessed through repeated 24h dietary records every 6 months (at least 3 in the first 2 years of follow-up). Iron (total and heme iron) intake from meat was derived from the NutriNet-Santé food composition table. Functional intestinal disorders such as IBS or constipation in the past 12 months were self-reported every year in a general health questionnaire. Associations between sex-specific quintiles of intakes for red meat, poultry or heme iron from red meat, and functional intestinal disorders was analyzed using multi-adjusted Cox models.

RESULTS

Of 77,128 participants, 4,868 (6.31%) reported functional intestinal disorders during follow-up. After adjustments on potential confounding factors. Analyses by meat subtypes revealed differences according to heme iron content: higher red meat consumption was associated with more functional intestinal disorders (HR Q5 vs Q1 = 1.15, 95% CI 1.036-1.274), while such association was not observed for poultry (HR Q5 vs Q1 = 1.03, 95% CI 0.94-1.14). According to our mechanistic hypothesis, a higher intake of heme iron from red meat was also associated with more functional intestinal disorders (HR Q5 vs Q1 = 1.15, 95% CI 1.04-1.27).

CONCLUSIONS

This study suggested that consuming heme-rich meat may be associated with more functional intestinal disorders. These RESULTS should be further confirmed using Rome criteria, which would enable to target abdominal pain more specifically. Pre-clinical experiments are also needed to assess the mechanistic hypothesis of the heme-induced lipid peroxidation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP35_05

EFFECT OF FORTIFIED BALANCED ENERGY-PROTEIN SUPPLEMENTATION DURING PREGNANCY AND LACTATION ON INFANT NEURODEVELOPMENT: A COMMUNITY-BASED RANDOMIZED CONTROLLED TRIAL IN RURAL NEPAL

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BACKGROUND AND OBJECTIVES

Few studies have examined the effect of balanced energy–protein (BEP) supplementation in pregnancy and/or lactation on infant neurodevelopment. We examined the effect of a fortified BEP supplement during pregnancy and lactation on infant neurodevelopment at 6 months of age.

METHODS

The Maternal Infant Nutrition Trial (MINT) is a 2x2 factorial, unblinded, household randomized efficacy trial conducted in Sarlahi District, Nepal (1). Between November 2021 and August 2023, pregnant women (n=1944) were enrolled in early pregnancy and randomized to receive a daily multiple-micronutrient fortified BEP supplement or no supplement (standard of care with iron folic acid) from 14 weeks' gestation to the pregnancy outcome. After delivery, households with at least one live birth were randomized to receive fortified BEP supplement or no supplementation to 6 months postpartum. In a sub-study of this trial, we selected the first 100 infants in each intervention group of the postpartum phase for a neurodevelopment assessment (pregnancy supplementation only, postpartum supplementation only, both, and neither). At 6 months, infants underwent assessment for cognitive, motor, language and socioemotional performance using the Bayley Scales of Infant and Toddler Development (4th edition). Generalized linear models were used to calculate the mean difference for each of the four neurodevelopment outcome domains.

RESULTS

Baseline characteristics of participants were similar across the four trial groups. Compared to the pregnancy no supplementation group, infants born to mothers who received pregnancy supplementation did not differ in their cognitive standard score (mean difference [MD]: 2.0, 95% CI: -0.29 to 4.29), language standard score (MD: 1.23, 95% CI: -0.16 to 2.63), motor standard score (MD: 0.98, 95% CI: -1.41 to 3.36), and socioemotional standard score (MD: -2.35, 95% CI: -5.27 to 0.57). The mean standard scores for children born to mothers who received postpartum supplementation compared to those who did not were also similar for all four domains. The final regression model comparing each supplementation group to the no supplementation group showed a higher mean standard score of 2.12 (95% CI: 0.16 to 4.08) for the language domain in infants born to mothers who received supplements in both pregnancy and postpartum period but no other significant differences.

CONCLUSIONS

BEP supplementation did not improve neurodevelopment at 6 months of age except for the language domain. Evaluation of children's neurodevelopment at a later age is warranted.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP35_07

INCREASING UPTAKE OF NUTRITION PRACTICES ACROSS THE LIFE CYCLE: FOSTERING A SOCIAL MOVEMENT FOR TRANSFORMATIVE, COMMUNITY-LED CHANGE

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BACKGROUND AND OBJECTIVES

Jordan faces a dual burden of overweight/ obesity and undernutrition. Maternal, infant and young child nutrition (MIYCN) practices affect both undernutrition and overweight/ obesity outcomes. Despite substantial attention, MIYCN behavioral indicators in Jordan have remained persistently below national and global targets (e.g., 24% of children <6 months are exclusively breastfed (EBF) and 27% of children 6-23 months consume a minimum acceptable diet). In response, the USAID funded Community Health and Nutrition (CHN) Activity seeks to foster a social movement to accelerate maternal, child, and family nutrition outcomes. The Activity uses a systems approach that empowers communities as champions of their own health.

METHODS

CHN's social movement aims to create an enabling environment for MIYCN practices and support women and families to demand quality services to support their nutrition needs throughout the life cycle. The social movement is guided by an SBC strategy, informed by findings from a literature review and formative research conducted. The SBC approaches and activities implemented have sought to reach and engage audiences across the life cycle, focusing on pregnant and lactating women, parents of children under the age of 2, and influencers, using multiple reinforcing channels: mass media to shift knowledge, attitudes, norms; peer support groups, community dialogue and mixed media to enhance skills, provide social support, promote positive attitudes and norms, and strengthen community-to-facility connections.

RESULTS

Between 2022 and 2024, CHN's community level SBC activities implemented in partnership with CBOs and primary health care level health committees reached more than 41,000 community members. CHN's two mass media campaigns each achieved national reach exceeding 10 million. Additionally, community champions promoted for MIYCN support in their communities resulting in establishment of breastfeeding rooms and implementing youth led initiatives.

CONCLUSIONS

SBC interventions in global nutrition programming have long focused on addressing individual-level behaviors and determinants and have minimally considered importance of social change in achieving nutrition objectives. Jordan CHN's experience provides a valuable case study, demonstrating how community-driven SBC programming can be designed and delivered to support a larger social movement for transformative change in nutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP35_08

EFFECT OF QUINTUPLY-FORTIFIED SALT ON MICRONUTRIENT STATUS OF NON-PREGNANT WOMEN OF REPRODUCTIVE AGE IN PUNJAB, INDIA

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BACKGROUND AND OBJECTIVES

The burden of multiple micronutrient deficiencies among women in South Asia remains unacceptably high. In India, salt may be an attractive fortification vehicle, as 94% of households consume iodized salt. Recent advancements in technology have enabled the production of quintuply-fortified salt (Q5S) with iron, zinc, folic acid, vitamin B12, and iodine. This study evaluated the effect of the novel Q5S on the micronutrient status of non-pregnant women of reproductive age (NPWRA) in Punjab, India.

METHODS

In this double-blind, randomized, controlled community-based trial, 998 NPWRA were randomized to receive i) Q5S with iron as encapsulated ferrous fumarate, zinc, vitamin B12, folic acid, and iodine (eFF-Q5S); ii) Q5S with iron as encapsulated ferric pyrophosphate plus ethylenediaminetetraacetic acid, and the same micronutrients (eFePP-Q5S), or iii) iodized salt (IS). Biomarkers of micronutrient status were assessed at enrollment, 6 m, and 12 m. The effect of the intervention was assessed using inverse-probability of censoring weighted regression models adjusting for baseline biomarker concentration.

RESULTS

At enrollment, the prevalence of anemia (hemoglobin <12 g/dL), iron deficiency (inflammation-adjusted ferritin <15 ug/L), hypozincemia (serum zinc <70 ug/dL), vitamin B12 insufficiency (serum B12 <221 pmol/L), and folate insufficiency (red blood cell folate <748 nmol/L) across all participants were 47.9%, 59.7%, 27.0%, 61.5%, and 69.7%, respectively. Salt utilization during the follow-up period was 6.0 ± 2.3 g/adult female equivalent/per day. At 6 m, the odds of zinc deficiency (OR: 0.49; 95% CI, 0.30, 0.80), $p < 0.05$), vitamin B12 insufficiency (OR: 0.20; 95% CI, 0.13, 0.31), $p < 0.001$), and folate insufficiency (OR: 0.14; 95% CI, 0.09, 0.21), $p < 0.001$) were 51%, 80% and 86% lower in the eFF-Q5S vs. IS group. At 12 m, the odds of vitamin B12 and folate insufficiency were 86% and 82% lower in the eFF-Q5S vs. IS group. Participants in the eFePP-Q5S group demonstrated similar reductions in the odds of vitamin B12 and folate insufficiency in comparison to the IS group. There was a non-significant reduction in the odds of iron deficiency in the eFF-Q5S and eFePP-Q5S vs. IS group at 6 m and 12 m.

CONCLUSIONS

Quintuply-fortified salt improved the zinc, vitamin B12, and folate status of NPWRA in Punjab. There is a need to evaluate the impact of salt fortification interventions in other nutritionally vulnerable populations.

CONFLICTS OF INTERESTS

Kenneth H Brown is a part-time consultant to the Bill and Melinda Gates Foundation but had no role in the evaluation or funding decision for the current grant.

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OAP35_09

CALIBRATING THE COSTS AND BENEFITS OF REPLACING IRON-FOLIC ACID WITH MULTIPLE MICRONUTRIENT SUPPLEMENTS IN 25 LOW- AND MIDDLE-INCOME COUNTRIES

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BACKGROUND AND OBJECTIVES

While antenatal multiple micronutrient supplements (MMS) have been shown to improve pregnancy outcomes compared to iron and folic acid supplements (IFA), costs remain a concern for achieving scale and sustainability. We calculated the costs and benefits of transitioning from preventive IFA to MMS in the 25 low- and middle-income countries (LMIC) with the greatest burden of low birthweight (LBW), under different costing scenarios.

METHODS

We generated new data on the costs of: both supplements transition associated with moving from IFA to MMS; and the associated complementing activities that strengthen the provision of antenatal care (ANC).

We modeled two coverage scenarios: (1) Replacing IFA with MMS at existing levels of IFA coverage (180 tablets per woman); and (2) Providing MMS at a level of coverage equivalent to the percentage of women who have at least one ANC visit (ANC1+).

Benefits were calculated as the additional number of LBW, stillbirths, and female neonate deaths averted. We calculated the cost of a LBW averted as the total cost of replacing IFA with MMS divided by the number of LBW averted. We compared this against the discounted present value of averting a LBW. We did so for nine scenarios based on different assumptions of cost estimates and levels of coverage using a seven year time horizon (two transition years and five implementation years).

RESULTS

Costs ranged from $235.6 million, or $33.6 million/year to $1399.9 million, or $200 million/year. These amounts are equivalent to 0.7 and 5.7 percent of current global spending on nutrition. Over five years of implementation:

(1) when IFA is replaced with IFA, 3,514,594 LBW, 186,369 stillbirths and 218,914 female neonate deaths are averted;

(2) when coverage is set at ANC1+, 7,272,320 LBW, 473,471 stillbirths and 541,591 female neonate deaths are averted.

Replacing IFA with MMS generates a minimum of $1.335 billion in economic benefits; providing coverage at the level of ANC1+ generates $2.763 billion in economic benefits.

CONCLUSIONS

Replacing antenatal IFA with MMS has large health and economic benefits. The cost of doing so is a small fraction of current global spending on nutrition. These findings further support the case for shifting from the provision of IFA to MMS for pregnant women in LMIC.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 37 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP37_01

MULTIPLE NUTRIENT SHORTFALLS ACROSS THE LIFESPAN: THE SILENT HEALTH CRISIS IN DEVELOPED NATIONS

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BACKGROUND AND OBJECTIVES

Poor diet, including an overconsumption of nutrients of concern and an underconsumption of essential nutrients, is a leading cause of disease in developed nations. To improve diet quality and prevent diet-related disease, we identified the nutrients with inadequate intakes and those with the greatest association with preventing health outcomes in the United States, Australia and New Zealand across the lifespan.

METHODS

We developed a five-step process to identify the priority nutrients in each country: 1. Determine the demographic groups (age and sex); 2. Identify the health priorities based on nationally representative data; 3. Assess the nutrients consumed at insufficient levels via the most recent nutrition surveys and scientific literature; 4. Identify the associations between nutrients and health priorities using systematic review evidence; and 5. Identify the priority nutrients (for each demographic group) using a quantitative scoring matrix based on steps 2-4. Priority nutrient intake levels were compared against intakes required to reduce disease risk and the recommended dietary targets for each country.

RESULTS

Up to 22 essential nutrients were consumed below recommended levels, with four identified as the highest priority and showing high similarity between countries: vitamin D, calcium, magnesium, and dietary fiber. Nutrient shortfalls were most prevalent in older adults, teenagers, and pregnant and lactating women. Comparing priority nutrient intake levels with current requirements indicated that higher vitamin D and calcium intake could benefit health.

CONCLUSIONS

The extent of nutritional inadequacies in developed countries is high and contributes to the disease burden. Nutrient prioritization is an important part of the strategy to address this burden sustainably. The findings highlight the nutrients that must be prioritized in public health policies for nutritious and sustainable diets.

CONFLICTS OF INTERESTS
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OAP37_02

CONCURRENT OVERNUTRITION AND ANEMIA IN ADOLESCENT GIRLS IN INDONESIA : INDONESIA BASIC HEALTH SURVEY

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BACKGROUND AND OBJECTIVES

Indonesia is currently experiencing a triple burden of malnutrition that occurs simultaneously, two of which have the potential to occur in the female adolescent population, namely overweight/obesity, and anemia. The Indonesia Basic Health Survey shows an increased prevalence of overweight, obesity, and anemia in Indonesian adolescents from 2013 to 2018. This study aims to determine the concurrent overnutrition and anemia in adolescent girlis based on basic health survey in Indonesia.

METHODS
This research uses quantitative METHODS with a cross-sectional study design that is analytical and observational as the basis for this research. Data analysis used the chi-square test and multiple logistic regression which aims to analyze concurrent overnutrition and anemia in adolescent girls aged 13-18 years in Indonesia and related factors based on the 2018 Indonesia Basic Health Survey analysis.
RESULTS
The RESULTS of the study show that the variables area of residence (p=0.028) and consumption of soft drinks/carbonated drinks (p=0.049) were significantly related to concurrent overnutrition and anemia in adolescent girls. Based on the RESULTS of the multivariate analysis data obtained shows that the area of residence with a p-value of 0.007 AOR 0.520 (95% CI; 0.323-0.838) was the most influential variable on the concurrent overnutrition and anemia.
CONCLUSIONS

This study concludes that adolescent girls living in rural areas are more at risk of concurrent overnutrition and anemia in Indonesia. Our recommendation is the need for equitable health development throughout Indonesia, especially in areas far from the center of the country.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP37_03

MATERNAL AWARENESS OF CHILD DEVELOPMENT AND GROWTH OUTCOMES IN THE MALIAN CONTEXT: USE OF THE AGES AND STAGES QUESTIONNAIRE

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BACKGROUND AND OBJECTIVES

Early childhood development (ECD) is the age-related attainment of key physical, cognitive, social-emotional and language skills, affecting individuals and societies, through academic, behavioural, and economic outcomes. Challenges exist in low- and middle-income countries (LMICs), with 52.9mil infants at risk of delay, worst in conflict-affected settings like Mali. Little research has considered the role of maternal awareness on outcomes which enables her to track nutrition, stimulation or seek help for delay. We investigated ECD/ASQ3 predictors and maternal awareness of ECD milestones in 6-36 month infants using the Ages and Stages Questionnaire v3 (ASQ-3), adapted for Mali with added interviewer observations.

METHODS

We analysed cross-sectional data from 6027 children in 120 socioeconomically deprived communities through structured caregiver interviews collected during a large RCT. We calculated z-scores for the 5-domains (C=communication, GM=gross motor, FM=fine motor, PS=problem solving, P-S=personal-social), analysed for discrepancies between maternal response and interviewer observation. Mixed-effects logistic regression explored risk factors/predictors 27 child, maternal and household domains, including factors such acute/chronic illness, disability, nutrition, growth, stool pathogens, sanitation/hygiene, vaccination, internally-displaced, and maternal empowerment.

RESULTS

Infants' mean z-scores for the total sample across the five domains were C=-0.25, GM:-0.49, FM:-1.39, PS:0.77 and P-S:-0.67. Positive factors for total ASQ3 were maternal empowerment (RR=0.27;95%CI0.06,0.48), meeting min-dietary requirement, and using soap, while stunting and breastfeeding were risk factors. Disagreements between mother and observer (mothers underestimating milestone achievements) varied across domains: C:159, GM:135, FM:219, PS:193 and P-S:91, highest in FM and PS with the lowest overall z-scores. Disagreements increased with increasing age (particularly after 10 months, infant crawling); urban residence, older, girl-child, women's empowerment were risk factors.

CONCLUSIONS

In LMICs such as Mali, mothers may not be appropriately engaging to understand or gauge ECD, with reduced scores for children - likely more significant in those with high risk factors. Discrepancies and lower scores were particularly in domains which require engagement. Findings bear weight for initiatives like WHO's Integrated Management of Neonatal and Childhood Illness (IMNCI) aiming to increase maternal awareness and engagement with child development.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP37_05

PARTICIPATORY WORKSHOPS TO IDENTIFY CHALLENGES AND SOLUTIONS IN IMPLEMENTING COMPREHENSIVE SCHOOL FOOD AND NUTRITION PROGRAMS IN KENYA

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BACKGROUND AND OBJECTIVES

While schools are important settings for implementing comprehensive school food and nutrition programs (SFNPs), the extent and challenges of implementing such programs are not well documented. We conducted participatory workshops with the school community to identify challenges and solutions in implementing SFNPs in Kenya.

METHODS

In 7 schools selected from 2 urban areas, 4 separate 'Challenge' workshops were conducted with teachers, students, parents and caterers/food vendors to identify the challenges they face with implementing SFNPs (n=28 workshops, 184 participants). At the end of the workshop, a voting game was used to select the 3 most important challenges for each school. Representatives of the teacher, student, parent, and caterer/food vendor groups were then invited to engage together in a 'solution' workshop (n=7 workshops, 60 participants) to address their top 3 challenges. A four-point matrix was used, in which the participants indicated the '**Idea'** (solution), '**Who'** should implement the solution (stakeholders), '**How'** it should be implemented (steps/processes) and '**What'** is needed for implementation (resources).

RESULTS

The school community raised many challenges, in particular related to i) Food provision, i.e. poor quality and diversity of meals, inadequate infrastructure for cooking/serving; ii) Water sanitation and hygiene, i.e. water shortage, insufficient handwashing stations and latrines, poor garbage systems; iii) School gardens, i.e. inadequate farming space and equipment, low diversity in production, poor attitudes and knowledge toward farming; iv) Food prices that are high and fluctuant; v) Food safety, i.e. poor knowledge and practices from food handlers and inadequate storage facilities; vi) Physical education, i.e. lack of skilled trainers, inadequate space and equipment, no motivation for physical activities. The school community proposed several solutions that could be implemented at government or school level, including: i) introduce taxes on unhealthy foods to fund infrastructure and SFNPs; ii) involve nutritionists and the school community, including parents and pupils, in developing school menus; iii) create school gardens and liaise with agricultural services for capacity building of students and school staff.

CONCLUSIONS

Strategies to address these challenges should be instituted for the benefit of both children and the school community. Further work is required to translate these ideas into feasible interventions, considering the perspectives of decision-makers, funders and implementers.

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OAP37_06

UNDERSTANDING WOMEN'S DECISION-MAKING AUTONOMY AND SELF-EFFICACY RELATED TO SEEKING AND ACCESSING VITAL HEALTH AND NUTRITION SERVICES IN CAMBODIA AND SENEGAL

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BACKGROUND AND OBJECTIVES

Health services that offer counseling for and access to prenatal supplements, optimal infant and child nutrition practices, acute malnutrition screening, and vitamin A supplementation for children under five are essential for improving maternal and child health in Asian and Sub-Sahara African settings. However, access to these services remains constrained due to contextual factors such as availability, accessibility, and affordability. While research has found women's empowerment and agency to be associated with positive health outcomes, structural inequalities and other gender-related barriers to these services are less understood. This study will investigate women's decision-making autonomy and self-efficacy, as well as the relationship between the two constructs and how they influence health-seeking behavior in Cambodia and Senegal as part of a larger research project that aims to understand the gender-related barriers to seeking access to and utilizing lifesaving health services in these contexts.

METHODS

Embedded within a larger multi-country program that aims to increase access to and improve quality of these services, baseline data will be collected via representative cross-sectional surveys with mothers of children under 5 years old across seven provinces in Cambodia (n=1,520) and five regions in Senegal (n=6,999) between November 2024 and May 2025. Indicators of women's agency and decision-making power include actual and preferred decision-making autonomy regarding accessing the five lifesaving interventions, perceived self-efficacy as a proxy of agency and key behavioral driver, and other indicators of women's autonomy. The items are inspired by the Real Accountability: Data Analysis for RESULTS (RADAR) and the Project-level Women's Empowerment in Agriculture (Pro-WEIA) questionnaires on women's empowerment, and the 8-item New Generalized Self-Efficacy Scale (GSES). Survey data will be analyzed using bivariate and regression analyses to describe decision-making autonomy, self-efficacy, and investigate the relationships between self-efficacy and women's decision-making power and health care-seeking behaviors. We will also explore variations in maternal autonomy and self-efficacy across the study settings.

RESULTS

Findings will be available by May 2025.

CONCLUSIONS

The study's findings will contribute to a better understanding of factors to consider in designing interventions to promote equitable healthcare access and improve maternal and child health and nutrition outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP37_07

NUTRITIONAL STATUS, PHYSICAL ACTIVITY, AND STRESS LEVELS AFFECT THE BODY FAT PERCENTAGE OF INDONESIAN SCHOOL TEACHERS

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BACKGROUND AND OBJECTIVES

The body fat percentage of Indonesian school teachers is influenced by three key factors: nutrition, physical activity, and stress levels. Consuming a balanced diet is essential for maintaining a healthy body. Engaging in regular exercise helps burn calories and build muscle, contributing to overall well-being. Elevated stress can alter bodily functions and affect eating habits, which in turn impacts body fat. By understanding these factors, we can identify ways to support teachers in leading healthier lives.

METHODS

The study was a cross-sectional study conducted on 146 elementary, middle and high school teachers in 6 schools in one district in Indonesia. Data collection was carried out using questionnaires and direct measurements for anthropometric tests. The measurement instruments used in this study were informed consent, GPAQ questionnaire for physical activity, DASH questionnaire for stress levels, Shoor board and scales for nutritional status, and BIA analysis for body fat percentage. Bivariate analysis was conducted to determine whether or not there was a relationship between variable.

RESULTS

Based on the characteristics of the respondents, most (48.6%) of elementary, junior high, and high school teachers who were respondents were aged between 30-49 years, dominated by female teachers (66.4%). Based on the body mass index value, as many as 90 respondents, or 61.6% had overweight nutritional status. 80.1% of teachers in this study had a high percentage of body fat. There is a relationship between nutritional status and physical activity ($p<0.05$) with the percentage of body fat of teachers who were the samples of this study.

CONCLUSIONS

There was a need to increase physical activity and implement a balanced nutritional diet for teachers in schools so that they had a normal body fat percentage and better teaching performance.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP37_08

THE MUSHROOMS ON THE MENU (MOM) STUDY: VITAMIN D MUSHROOMS (UV-EXPOSED) ARE A FEASIBLE AND ACCEPTABLE WAY TO INCREASE VITAMIN D INTAKE IN A RESIDENTIAL AGED CARE FACILITY

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BACKGROUND AND OBJECTIVES

Vitamin D deficiency is highly prevalent in residential aged care due to reduced skin synthesis and less time outdoors, and it is associated with poor health outcomes. Supplementation is variable and often suboptimal. Due to limited food sources, diet is frequently overlooked, yet vitamin D mushrooms can raise vitamin D levels in deficient individuals to the same level as a supplement.

METHODS

MOM was a 10-week prospective pre-post mixed METHODS study that evaluated the feasibility of adding vitamin D mushrooms to the menu of a residential aged care facility. During the 4-week baseline phase, residential care (RC) participants ordered meals from the standard food service menu, while independent living (IL) followed their usual diet. During a 4-week MOM phase, participants were instructed to order (RC) or prepare (IL) at least one mushroom meal containing 75g of commercially available UV-exposed Agaricus bisporus mushrooms daily (18 ug of vitamin D). In RC, 28 recipes were modified to include the mushrooms. RC participants chose one vitamin D mushroom meal from the lunch or dinner menu, and IL participants were instructed to prepare one vitamin D mushroom meal daily. The participants' daily intake of energy, macronutrients, total vitamin D, vitamin D2 and sodium on the standard menu versus MOM were estimated by plate wastage (RC) and via 24-hour recalls (IL). Qualitative data were collected during and post the MOM.

RESULTS

In RC, vitamin D menu provision during MOM increased by 180% compared to the standard menu (7.0ug vs 2.5 ug, $P<0.0001$), with not significant differences in energy and other nutreints. During MOM, vitamin D intake increased by 212% for RC(6.0 vs. 18.7 ug; $p<0.001$) and 740% for IL participants (8.7ug vs. 73.1ug; $p<0.0001$) compared to baseline, representing 125% and 1387% of the Australian vitamin D targets. Over 75% of participants rated the taste of the mushroom meals as good or excellent, enjoying them as both hero and complimentary ingredients. Over 75% of staff understood the health benefits of vitamin D mushrooms, an found the meals easy to prepare while highlighting a need for low-burden processes. Participants and staff supported the continued inclusion of MOM.

CONCLUSIONS

MOM is a well-accepted food-first approach that provides substantial vitamin D among aged care residents, exceeding daily targets. A food first appraoch to addressing vitamin D deficiency in aged care is feasible and accepted.

CONFLICTS OF INTERESTS

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OAP37_09

ADOLESCENT NUTRITION ANAEMIA REDUCTION PROGRAMS AND POTENTIAL BENEFITS TO TRANSITIONING TO WHO FORMULATION

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BACKGROUND AND OBJECTIVES

The World Health Organization (WHO) recommends Weekly Iron Folic Acid Supplementation (WIFAS) containing 60 mg elemental iron and 2.8 mg folic acid be provided to menstruating adolescents (10-19 yrs) and women (20-49 yrs) where anaemia is greater than 20%. It also aims to prevent neural tube defects (NTDs). The WHO recommended formulation was added to the WHO model list of essential medicines (EML) in 2023; however, many national adolescent nutrition programs continue to use a lower dose folic acid supplement (0.4mg folic acid) -the available formulation from maternal IFA programs, while navigating national EML procceses and a potential transition in formulation. With higher rates of unplanned pregnancies in adolescence, the increased dose of folic acid in the WHO formulation has potential for added benefits of reducing neural tube deffect (NTD) affected pregnancies. We estimated additional benefits of transitioning to the WHO WIFAS in 6 national programs.

METHODS

We used WIFAS coverage and adherence data from 2023 in government adolescent nutrition programs in Africa and Asia, supported by Nutrition International along with country specific adolescent fertility and birth rates, NTD rates, anaemia prevalences and effect sizes to model potential benefits. Using serum folate increase of 1.2 nmol/l per week (found during our previous RCT conducted with partners; Samson et. al. 2020) and the published effect sizes associated with similar changes in serum folate per week with folic acid fortification we modeled an estimate of 36% reduction in relative risk of NTD affected pregnancies and as aligned with current WHO guideline a 35% reduction in relative risk of anaemia.

RESULTS

Programs reached 4.3 million girls and we estimated averted 736,000 cases of anaemia and with a transition to the WHO formulation could have prevented 295 NTD affected pregnancies and the devastating consequences; however, some of the adolescent girls most likely to become pregnant may not access school-based WIFAS delivery.

CONCLUSIONS

Adolescent nutrition programs with the specific WHO recommended WIFAS have potential to advance anaemia reduction with their own unique formulation, while also preventing risk of NTDs in adolescent pregnancies. Programs require effective supply and procurement strategies and countries need local cost-benefit data to guide planning and decision making and to assess the potential impacts of transitioning from existing iron folic formulation to the WHO formulation with higher folic acid. Adolescent responsive health systems and social saftey nets are much needed to reach girls in vulnerable contexts.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 39 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP39_02

IMPROVING ACCESS TO QUALITY NUTRITION SERVICES AND INFRASTRUCTURE IN ECCD CENTRES: BRIDGING GAPS TO ENHANCE CHILD HEALTH AND LEARNING OUTCOMES

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BACKGROUND AND OBJECTIVES

Nutrition is a basic human right, one that should be fulfilled in accordance with the age and sex of the child, and this should be active during the crucial, first 1,000 days. The focus of this study (ECCD Assessment) was to identify gaps and opportunities for integrating nutrition education in early childhood care and development (ECCD) to enhance child nutrition and learning outcomes. Specifically, this study aimed at: a) evaluating the quality of infrastructure in ECCD centers to identify gaps affecting child development; b) examining service providers' certification, training, and nutrition knowledge to address human resource challenges; c) assessing the extent of multi-sectoral collaboration and its impact on nutrition practices; and d) analyzing nutritional practices, focusing on age-appropriate feeding and child growth monitoring.

METHODS

The assessment employed a quantitative survey, carried out in five regions of Tanzania (Katavi, Kigoma, Njombe, Rukwa, and Songwe), that examined 733 ECCD centers and included 3,350 participants, such as government officials, directors, and caregivers. The data collection process consisted of two phases: profiling centers through government records and conducting detailed digital surveys using Kobo Toolbox

RESULTS

The RESULTS showed low registration rates at 61%, inadequate infrastructure, with 23% of centers lacking teaching classrooms and having overcrowded sleeping areas, and challenges in human resources, as only 42% of the 1,846 service providers were certified, and fewer than 35% had basic knowledge or training in nutrition for infants and young children. Nutrition practices were found to be insufficient, with less than 35% of centers offering age-appropriate meals and only 2.3–4.3% having community health workers (CHWs) trained in child growth monitoring. Although 80% of centers worked with other sectors, only 15.4% involved nutrition officers, highlighting significant gaps in nutritional oversight.

CONCLUSIONS

It was the conclusion of the assessment that ECCD centres faces deficiencies in infrastructures, professional training of caregivers, and nutrition services. To address these deficiencies, a multifaceted approach is required, including addition of classrooms and sleeping facilities, enforcing dietary guidelines, certifying caregivers, and building the capacity of CHWs and caregivers, and engaging nutrition officers to improve child health and learning outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP39_03

EVALUATING AN ADAPTED HOME FOOD INVENTORY (HFI) DEVELOPED TO MEET THE CULTURAL NEEDS OF ENGLISH- AND SPANISH-SPEAKING POPULATIONS AND THOSE WITH LOW LITERACY

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BACKGROUND AND OBJECTIVES

Development of culturally-appropriate population-level interventions are critical to improve health equity. Yet, such research is stymied by the lack of specific, appropriate, and valid measurement tools for diverse populations. Few valid home food environment assessment tools exist, and none have been validated with large non-English speaking populations. In 2008, we developed and validated a Home Food Inventory (HFI) to assess healthfulness and obesity risk of home food environments using a checklist format. The HFI showed good reliability and construct validity and has been used extensively in the field. However, the original HFI is lengthy and was developed for English-speaking populations. Our goal was to develop home food environment assessment tools (paper and electronic) for use in English- and Spanish-speaking populations; this presentation includes validation findings related to that work.

METHODS

The HFI-Core (n=133 items) was developed via secondary data analysis of four other large studies that used the 2008 HFI. English and Spanish HFI-core versions were created and contextualized with advice from local and multicultural community members. Participants (n=77 English-speaking, 75 Spanish-speaking) assessed usability, satisfaction, criterion and construct validity (comparing HFI-Core scores and dietary intake from dietary recalls), and reliability.

RESULTS

Average completion time was 22 minutes, and 93% of participants were satisfied/very satisfied with the HFI-Core. Criterion validity was acceptable with Spearman correlations between staff and participant HFI-Core food categories (r=0.62 to 0.90; all p's <.05). Significant construct validity (r=0.22-0.27; all p's <.05) was shown comparing home vegetable availability with participant intake of vegetables and related nutrients and HFI-core fruit availability with intake of fruit and related nutrients. Positive and significant (p<.05) correlations were also shown for HFI Obesogenic Score and energy intake, HFI Sodium Score and sodium intake, and HFI Ultra-Processed Score and energy and sodium intake. Reliability of responses over 2-4 weeks was significant (r=0.49-0.80; p's<0.05).

CONCLUSIONS

Evaluation findings of the HFI-Core demonstrated reduced response burden, high participant satisfaction, criterion and construct validity, and reliability. The HFI-Core is the first validated instrument in our new toolkit and it sets the stage for next steps to advance behavioral nutrition METHODS to address the persistent health inequities.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP39_04

EXPLORING FACILITATORS AND BARRIERS TO SCHOOL FOOD PROGRAMS: PERCEPTIONS ON PROGRAM IMPLEMENTATION AND SUSTAINABILITY

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BACKGROUND AND OBJECTIVES

As Canada progresses toward its first-ever National School Food Program (NSFP), localized evidence is essential for fostering sustainable, equitable and resilient school food programs (SFPs). Addressing the existing fragmented patchwork of SFPs requires evidence-based insights accounting for regional diversity and global priorities. This study gathered insights from key informants (i.e., school level SFP coordinators) to understand the facilitators and barriers to SFP implementation and program sustainability across Ontario.

METHODS

Researchers collaborated with community partners and regional school boards to recruit SFP coordinators (i.e., food service managers, parent volunteers, school staff) from six public English school boards, representing diverse socio-economic backgrounds, cultural contexts, and geographic regions, and enabling a comprehensive exploration of local SFP practices on implementation and sustainability. Participants completed an online survey on SFP characteristics and operations, and were invited to a follow-up interview to discuss perceived facilitators and barriers in greater depth.

RESULTS

This study included 55 participants from 51 schools across six school boards, making it the most comprehensive exploration of Ontario's SFPs to date. Data collection comprised 54 surveys, 8 focus group interviews, and 22 individual interviews. Key barriers included insufficient funding, volunteerism, limited resources, and a lack of coordinated SFP networks (e.g., procurement, funding); while facilitators included strong school-level support, positive student impacts, and community engagement.This study highlighted that these facilitators and barriers not only influenced implementation success but also had an ongoing effect on the overall program sustainability.

CONCLUSIONS

SFPs represent an opportunity to establish healthy school food environments and enhance social safety nets, however, the current fragmented and resource-limited nature of Ontario's SFPs compromises their sustainability. Findings underscore the importance of addressing systemic barriers while leveraging local strengths to build resilient, equitable and sustainable SFPs. By emphasizing localized needs and capacities, these insights provide a foundation for the successful design and implementation of Canada's NSFP, contributing to global efforts to achieve sustainable food systems for children.

CONFLICTS OF INTERESTS

This research is a part of the Feeding Kids, Nourishing Minds project, which is funded by the Joannah and Brian Lawson Centre for Child Nutrition, University of Toronto and the unrestricted donation from the President's Choice Children's Charity. PCCC had no role or input in any aspect of the research project. The authors had no financial relationships with any organizations that might have an interest in the presented work in the previous five years; no other relationships or activities that could appear to have influenced the presented work.

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OAP39_05

ASSOCIATIONS OF TEA AND COFFEE CONSUMPTION WITH DYSMENORRHEA AMONG REPRODUCTIVE-AGE WOMEN IN BEIJING, CHINA

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BACKGROUND AND OBJECTIVES

With the rapid economic development and lifestyle changes in recent years, the consumption of tea and coffee has significantly increased among women in major cities in China. However, their impact on reproductive health, particularly menstrual health, remains unclear. This study aimed to examine the associations between tea and coffee consumption and dysmenorrhea among reproductive-age women.

METHODS

As part of the Multilevel Natural Population and Maternal Cohort Study, 1,247 women were recruited from 10 community health service centers in six districts of Beijing between September and November 2021. Beverage consumption, including coffee, brewed leaf tea, herbal tea, and milk tea, was assessed using a validated food frequency questionnaire (FFQ). Dysmenorrhea severity was evaluated using the Numeric Pain Rating Scale (NPRS). Multinomial logistic regression was used to assess associations between beverage consumption and dysmenorrhea.

RESULTS

Among the participants, 29.11%, 32.56%, 29.91%, and 20.69% regularly consumed coffee, brewed leaf tea, herbal tea, and milk tea, respectively (defined as more than 1 cup/bottle per day, 1 cup/bottle ≈ 300 mL). During menstruation, regular consumption rates decreased to 15.72%, 19.57%, 21.81%, and 15.08% for coffee, brewed leaf tea, herbal tea, and milk tea, respectively. During non-menstrual days, regular coffee consumption was associated with a higher prevalence of dysmenorrhea for mild dysmenorrhea (aOR = 1.97, 95% CI: 1.03–3.79) and moderate-to-severe dysmenorrhea (aOR = 3.27, 95% CI: 1.59–6.73). Regular brewed leaf tea and milk tea consumption were positively associated with moderate-to-severe dysmenorrhea (brewed leaf tea: aOR = 3.02, 95% CI: 1.31–6.96; milk tea: aOR = 2.91, 95% CI: 1.31–6.43). Occasional coffee consumption was also associated with moderate-to-severe dysmenorrhea (aOR = 2.19, 95% CI: 1.20–3.99), while occasional brewed leaf tea or milk tea consumption showed no association. No significant association was observed between herbal tea consumption and dysmenorrhea. During menstruation, only regular milk tea consumption was associated with moderate-to-severe dysmenorrhea (aOR = 2.48, 95% CI: 1.09–5.64); no associations were observed for other beverages.

CONCLUSIONS

Regular consumption of coffee and tea is associated with increased prevalence of dysmenorrhea among reproductive-age women, suggesting a potential influence of dietary habits on menstrual health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP39_07

THE SIGNIFICANT ROLE OF HEALTH CARE PROVIDERS IN PROMOTING PREGNANT WOMEN'S ADHERENCE IN TAKING MULTIPLE MICRONUTRIENT SUPPLEMENTS: INSIGHT FROM INDONESIA

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BACKGROUND AND OBJECTIVES

In 2021, Implementation Research (IR) was undertaken in 25 districts to inform efforts for scaling up multiple micronutrient supplements (MMS) within the context of antenatal care (ANC) in Indonesia. The IR began with formative research, which drew attention to the importance of healthcare providers (HCPs) as pivotal figures trusted by pregnant women (PW). The objective of this analysis was to further examine the role HCPs, particularly midwives, have in encouraging MMS adherence through counseling during ANC visits.

METHODS

This study utilized mixed METHODS longitudinal system trial in which all HCPs in the 25 districts were provided an online orientation on anemia, MMS, and communication training in certain areas, along with printed and electronic educational materials. At the study midpoint, nine focus group discussions (FGDs) were employed in a sub-set (n=3) of districts. In total, 75 midwives participated in the FGDs, which included detailed probing on their role in encouraging MMS adherence through ANC counseling. Transcriptions were organized into specific themes and presented in a matrix.

RESULTS

Midwives identified several factors impacting their ability to influence and encourage PW. Midwives reported that PW tended to be more engaged in MMS counseling during individual counseling sessions than they were in group counseling sessions, and PW experiencing their first pregnancies tend to ask more questions than those with previous pregnancies. Midwives spent more time (approximately 5-15 minutes) on counseling during the first MMS administration, as opposed to less than 5 minutes in subsequent counseling sessions. Other factors that limit the midwives' counseling include (1) the time PW spent on discussing complaints or side effects, (2) uncertainties among HCPs regarding the safety of MMS, (3) the lack of immediate solutions related to dealing with side effects, and (4) resistance or rejection from certain obstetricians who have not been adequately informed about MMS. Conversely, factors that enhance the counseling process consist of (1) communication training, (2) enthusiastic acceptance from PW, (3) support from family or community members, and (4) backing from obstetricians who have been thoroughly informed and have received additional socialization.

CONCLUSIONS

It is crucial to provide sufficient training about MMS to all ANC service providers, including midwives and obstetricians. Educating HCPs about the benefits and safety of MMS as well as how to address side effects and support PW to increase adherence is vital.

CONFLICTS OF INTERESTS

Kristen Hurley: Funding and Materials for the study described in this presentation were provided by the Kirk Humanitarian Foundation and Vitamin Angel Alliance. Dr. Hurley was also a paid consultant (technical advisor) to the Kirk Humanitarian Foundation and has received funding from Vitamin Angels to provide technical

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oversight to programs team. These arrangements have been reviewed and approved by the Johns Hopkins University in accordance with its conflict of interest policies.

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OAP39_08

MAPPING UNDISCLOSED FOOD ADDITIVES IN ULTRA-PROCESSED FOODS IN BRAZIL

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BACKGROUND AND OBJECTIVES

Ultra-processed foods (UPFs) consumption is linked to noncommunicable diseases. However, UPFs' ingredients and food additives (FAs) are not fully disclosed on labels, making the assessment of their health risks challenging. This study aimed to identify FAs not declared on food labels through an in-depth analysis of UPFs' ingredient lists and verify the degree of compliance of the information on FAs with current Brazilian food labelling legislation.

METHODS

Cross-sectional study using a sample of 3,438 UPFs commercialised in Brazil. Disclosed FAs and their technological functions and ingredients which were likely to contain undisclosed FAs were identified. The most common grouping patterns (i.e patterns across at least 50% of products per type) of disclosed FAs and technological functions of ingredients with simpler formulations were identified and attributed as undisclosed to ingredients with more complex formulations in which they were part of. For example, more than 50% of the food items of the ingredient vegetable fat contain antioxidant FAs INS 319 and INS 330, which were not declared on the ingredient list of more complex ingredients in which vegetable fat is part of, such as chocolate flavoured filling and chicken flavour bouillon cubes. Therefore, vegetable fat's FAs were attributed to these ingredients as undisclosed. The same procedure was performed for ingredients with ever-increasing degrees of complexity of their formulations and finally for the UPFs of the main sample. The most common grouping patterns of both disclosed and undisclosed FAs and technological functions were estimated by UPF's subgroups such as sweet cookies, soft drinks and pizzas. The compliance of the ingredient lists with the Brazilian food labelling legislation on FAs was verified.

RESULTS

A total of 91.1% of the UPFs contain 1 to 51 undisclosed FAs in the ingredient list; one in three FAs are undisclosed; and 22.2% of the ingredient lists did not comply with the food labelling legislation on FAs.

CONCLUSIONS

This study showed that the actual number of FAs present in UPFs sold in Brazilian supermarkets frequently outgrow those described in their ingredient lists due to the existence of a large number of undisclosed FAs, in great part associated with food ingredients which were also undisclosed—which is allowed by the Brazilian legislation. The RESULTS indicate the need for strengthening the Brazilian food labelling legislation on FAs to make transparent the use of these compounds and to provide more information to consumers to help them make better food choices.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 41 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP41_01

HAS UNDERWEIGHT INCREASED AMONG CHILDREN AND ADOLESCENTS DURING 2012-2019 AND DOES THE PREVALENCE DEPEND ON SOCIOECONOMIC CIRCUMSTANCES? A NATIONWIDE REGISTER-BASED STUDY FROM DENMARK

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BACKGROUND AND OBJECTIVES

Childhood underweight, indicated by low body mass index for age and sex, is associated with morbidity, mortality and poverty in low-income settings. However, it is largely overlooked in high-income countries, due to unequivocal focus on overweight. In this study, we investigated the development and socioeconomic characteristics of underweight among children and adolescents in Denmark during 2012-2019.

METHODS

We used nationwide register data on height and weight measured objectively in 461,041 Danish 6-7-year-olds and 365,312 Danish 14-15-year-olds during 2012-2019, covering 89% and 67% of all schoolchildren in these age groups. We calculated BMI z-scores and classified underweight using the International Obesity Task Force age- and sex-specific BMI cut-offs and linked these with data on parental education and household income.

RESULTS

The prevalence of underweight remained relatively stable at ~8.5% among 6-7-year-old girls during 2012-2019. Among 14-15-year-old girls, it was initially higher but decreased slightly (<1%-point) to 8.6% in 2019. Among boys, the prevalence increased from ~7% to just above 8% in both age groups during the period. Across all years, underweight was more common among 14-15-year-olds whose parents had long higher education (girls: 10.4%-12.1%; boys: 8.7%-10.2%) compared to primary school (girls: 5.6%-7.5%; boys: 6.1%-7.8%), with the most pronounced differences among girls. Similar, although smaller, differences were seen among 6-7-year-olds. Less distinct but comparable differences were found for income.

CONCLUSIONS

Underweight is prevalent, but has remained relatively stable during the 2010s among Danish children and adolescents. Unlike the pattern reported in low-income settings, and that seen for overweight, underweight is associated with socioeconomic advantage in this high-income setting.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP41_02

DO DANISH 6-9-YEAR-OLD CHILDREN ADHERE TO DIETARY GUIDELINES AND ARE THERE SOCIODEMOGRAPHIC DIFFERENCES? THE GENERATION HEALTHY KIDS STUDY

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BACKGROUND AND OBJECTIVES

The latest national Danish dietary survey, which was conducted more than 10 years ago, showed that children consumed too little fruit and vegetables and fish, and too much sugar and SFA. The survey showed considerable social disparities, but did not include children of non-Danish descendance or assess biomarkers of nutrient intake and status. We investigated dietary intake, adherence to the national food based dietary guidelines (FBDG) and Nordic Nutrition Recommendations, as well as nutritional status of 1094 Danish 6-9-year-old children and explored potential differences according to parental education, descendance, urbanization, sex and weight status. We focused on fruit & vegetables, fish, wholegrains, meat, dairy, SFA, added sugar, n-3 LCPUFA, and iron.

METHODS

The study is based on baseline data from a large school-based trial, Generation Healthy Kids. Parents completed an online background questionnaire, a fish FFQ and an online 3-day dietary record on behalf of their child. We collected fasting venous blood samples from the children for analysis of alkylresorcinols, n-3 LCPUFA, hemoglobin, and ferritin.

RESULTS

Mean age±SD was 7.8±0.6 years and 13% had overweight or obesity, equivalent to national numbers. Only 12%, 45% and 12% adhered to the FBDG for fruit & vegetables, wholegrains, and fish, of which they consumed (median (IQR)) 222 (137-326) g/d, 47 (28-70) g/d, and 14 (8-23) g/d, respectively. Only 17% adhered to the iron recommendation with an intake of 7.2±1.9 mg/d. Further, 86% and 67% of the children consumed too much meat and SFA, respectively, whereas the majority adhered to the guidelines for intake of dairy, sugar, dietary fibre, and vitamin D supplements. Long vs. short education was associated with higher intake of wholegrains and less meat, and rural vs. urban residence with lower intake of fruit & vegetables and higher intake of SFA and sugar, but also of wholegrains (all $P<0.05$). Non-Danish descendants had 28 (41;16) g/10 MJ lower intake of wholegrains, but also of sugar, than Danish descendants (both $P<0.001$). Boys consumed 58 (31;84) g/10 MJ less fruit & vegetables, but also less sugar and more wholegrains than girls ($P<0.01$). Weight status was not associated with the foods or nutrients investigated. Nutrient biomarkers will be presented at the conference.

CONCLUSIONS

Fulfilment of dietary guidelines still appears to be inadequate in many children in Denmark. The observed sociodemographic disparities are considerable and could guide future tailor-made interventions to promote healthy diets in schoolchildren.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP41_03

COMPARISON OF THE COSTS OF DIFFERENT STRATEGIES FOR THE DISTRIBUTION OF VITAMIN A; INSIGHTS FROM FOUR AFRICAN COUNTRIES DURING (JULY 2023 – JUNE 2024)

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BACKGROUND AND OBJECTIVES
Helen Keller has supported vitamin A supplementation (VAS) for children aged 6 to 59 months in several countries, aiming for 100% coverage with efficient implementation. Strategies include door-to-door campaigns, fixed and advanced METHODS, or a combination and routine distribution. This study compares the distribution costs of door-to-door with routine METHODS for the financial years July 2023 to June 2024.
METHODS

This analysis reviewed data from Cameroon and Mali (door-to-door) and Tanzania and Mozambique (routine) where Helen Keller supported vitamin A distribution from July 2023 to June 2024. Data was collected using internal tools:

1. Financial reports: Documentation of costs incurred by Helen Keller only

2. Programmatic reports: documenting coverage and the number of children supplemented

The data were analyzed using Excel to compare the cost per supplemented child by strategy type.

RESULTS

Despite higher costs per child in Tanzania (USD 0.35) and Mozambique (USD 0.48) due to significant training and policy development expenses, these countries achieve high coverage levels (119% and 83%). In contrast, costs in Mali and Cameroon are lower (USD 0.23 and USD 0.28) with coverage of 98% and 99%.

CONCLUSIONS

Door-to-door campaigns were the most cost-effective, while routine VAS offered higher coverage at higher costs in Tanzania and lower coverage in Mozambique. Although it is expensive at first, routine coverage can be as high as door-to-door coverage. Over time, the high costs of training and developing policy documents may come down. A better understanding of costs can help guide strategic choices for effective and sustainable distribution.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP41_04

OVEREATING AND ITS ASSOCIATIONS WITH CHANGE IN BMIZ DURING ADOLESCENCE

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BACKGROUND AND OBJECTIVES

Overeating is an eating behaviour, which refers to consuming food beyond nutritional needs or consuming large amounts of food in a short time. We studied whether preadolescents with parent-reported (PR) overeating, and self-reported (SR) overeating (with or without loss of control), exhibit different food consumption and meal patterns. Additionally, we studied how lifestyle factors predict short-term changes in BMIz during adolescence.

METHODS

This study included 5827 children with a mean age of 11.2 (SD 0.8) years from the Finnish Health in Teens (Fin-HIT) cohort. At baseline, the parent answered a question on child's tendency towards overeating. The children self-reported on overeating, hours of leisure-time physical activity per week, consumption frequency of sugary products, fast food, and fruits and vegetables. A regular meal pattern was defined as having breakfast and dinner every school day. Height and weight were measured at baseline and 2.7 years later at follow-up, and BMI z-scores were calculated (IOTF reference). We used a general linear model with change in BMIz from baseline to follow-up as outcome.

RESULTS

The proportion of children with PR overeating was 9.3%, SR overeating 4.2%, and both eating behaviours 0.8%. PR overeating was more common in boys, while SR overeating in girls. Children with SR overeating ate more frequently sugary products and fast food (11.0 and 2.8 times per week, respectively) than children with PR overeating (7.8; 1.9) or than children with no overeating (8.8; 2.1), but fruit and vegetable consumption did not differ between the three groups. An irregular meal pattern was also more common in children with SR overeating than others. Children with SR overeating experienced 0.150 units (95% CI 0.073─0.227) and children with PR overeating 0.082 units (95% CI 0.028─0.135) bigger change in BMIz compared with children without overeating, after adjusting for age, physical activity and baseline BMIz. Besides eating behaviour, physical activity predicted change in BMIz (b=0.009 [95% CI 0.003─0.014]), but not food consumption or meal pattern.

CONCLUSIONS

SR overeating was the main predictor of change in BMIz during adolescence, compared with PR overeating, with physical activity also contributing, while food consumption and meal patterns showed no role. Interventions targeting overeating and physical activity should be implemented to improve adolescent weight management.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP41_05

FOLATE AND VITAMIN B12 STATUS, AND ANEMIA AMONG SENEGALESE ADOLESCENTS (10-19 YEARS): A NATIONAL CROSS-SECTIONAL SURVEY

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BACKGROUND AND OBJECTIVES

Folate and vitamin B12 deficiencies are widespread worldwide and constitute a risk factor of anemia which is a public health concern. In Senegal, the lack of recent data about anemia and its determinants, including folate and vitamin B12 deficiencies, among adolescents prevents the government from implementing adequate interventions to improve their nutritional status. The aim of this study is to determine the prevalence of folate and vitamin B12 deficiencies among Senegalese adolescents aged from 10 to 19 years.

METHODS

A quantitative, descriptive and analytical cross-sectional study was conducted at national level, area of residence, and five major ethno-cultural zones. A total of 2,193 adolescents were targeted in 2,260 households through a stratified three-stage sampling method. Socio-economic, socio-demographic, health and dietary patterns were collected using a questionnaire. Hemoglobin, serum folate and vitamin B12 were analyzed.

RESULTS

The median folate concentration was 22.3 µg/L [16-31,8 µg/L], and 2.8% of the adolescents had low serum folate (<10 nmol/L), with significant variations according to residence and wealth quintiles. Folate deficiency affected more significantly adolescents living in the southern areas (6.7%) and those of poorest households (5.5%). Only 1.8% of adolescents had low serum Vitamin B12 (<150 pmol/L). Vitamin B12 affected more adolescents 15-19 yrs old (15-19 yrs: 2.6% vs. 10-14 yrs: 1.2%; P=0.028), living in rural area (rural: 2.4% vs. urban: 0.8%; P=0.008) and in poorest households (poor: 6.3% vs. rich: 0.1%; P<0.001). Furthermore, 29.1% of the adolescents were anemic, with significant difference according to age group (10-14 years: 23.3% vs. 15-19 years: 30%). Folate deficiency was closely associated with vegetable consumption (OR=0.35; P=0.006) and household poverty (OR=10.8; P= 0.025) and is a major determinant of anemia in adolescents (OR = 2.20; P = 0.013).

CONCLUSIONS

Folate and vitamin B12 deficiencies are not public health issues among Senegalese adolescents (10-19 years). However, folate deficiency remains a risk factor of anemia and was closely linked to living conditions and dietary patterns in adolescents. Addressing these determinants could help to prevent anemia among Senegalese adolescents.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP41_06

VITAMIN D PROBIOTICS FORTIFICATION REDUCE LOW-BIRTH-WEIGHT PREGNANCY OUTCOME AMONG PREGNANT WOMEN

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BACKGROUND AND OBJECTIVES

Low birth weight remains a significant predictor of long-term health outcomes, morbidity, and early infant mortality. However, there is a paucity of data regarding the dietary consumption of vitamin D-rich foods by pregnant women and its impacts on birth weight. This study, therefore, investigated the effectiveness of vitamin D-fortified probiotic yogurt intake on low-birth-weight outcomes among pregnant women in Ghana.

METHODS

The study was a randomized single blinded controlled trial study that included 126 pregnant women aged 18 years and above without symptoms of UTI attending antenatal care at the Ejisu Government Hospital and Juaben Government Hospital in Ejisu-Juaben Municipality in the Ashanti Region, Ghana. Pregnant women were further divided into the Vitamin D probiotics fortified group (63) and the non-fortified group (63) and followed for 6 months. Blood samples were collected at baseline and end line for laboratory analyses and sociodemographic and clinical data. Statistical analyses were done in SPSS version 26.0 and R Language version 4.4.4 at $p < 0.05$ and a 95% confidence interval.

RESULTS

This study found 86.5% had inadequate dietary patterns and the prevalence of low-birth-weight was 11.5%. There was a significant association between gestational age ($p = 0.038$) and low birth weight pregnancy outcomes. Also, low-birth-weight was more predominant among women with inadequate dietary patterns (90.9% vs 9.1%; $p = 0.716$) than those with adequate dietary patterns, although not statistically significant. However, the Vitamin D probiotics fortified study group had significantly decreased low-birth-weight (3.8% vs 20.9%; $p = 0.0009$) compared to the non-fortified group. Additionally, at the end line, among pregnant women with normal weight birth outcomes, the fortified study group had significantly increased levels of Vitamin D ($p < 0.05$) and TAC ($p < 0.001$) compared to non-fortified group.

CONCLUSIONS

Ther is a high prevalence of inadequate dietary patterns (86.5%) and low birth weight (11.5%) among women in Ghana. However, interventions such as Vitamin D fortified-rich foods could serve as the best strategy to improve Vitamin D levels and better pregnancy outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP41_07

ASSOCIATION OF ORAL HEALTH AND NUTRITIONAL STATUS AMONG FILIPINO OLDER ADULTS

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BACKGROUND AND OBJECTIVES

Older adults comprised 8.5% of the Philippine population in 2020, projected to reach 19.6% by 2055, signaling a shift to an aging society. Poor oral health and malnutrition are key issues, with malnutrition linked to socio-demographic factors and food insecurity. This study aims to describe the prevalence of oral health problems and nutritional status among Filipino older adults, examine their relationship and identify influencing factors.

METHODS

Data were drawn from the Longitudinal Study on Health and Aging in the Philippines, a nationally representative cohort. Using a cross-sectional design, the study analyzed oral health factors, nutritional status using BMI, lifestyle behaviors through descriptive statistics and logistic regression.

RESULTS

Filipino older adults have low tooth retention, averaging seven original teeth. Undernutrition is associated with fewer teeth, poor appetite, inadequate protein intake, lower socioeconomic status and smoking. Denture use reduces undernutrition risk by 39.6%. Better oral health, wealth, and being female increase the odds of being overweight. Psychosocial factors and physical activity and non-smoking also affect nutritional outcomes.

CONCLUSIONS

Oral health influences nutritional status in older adults. Integrated oral and nutrition interventions are essential to promoting healthy aging, focusing on affordable dental care, nutrition support, and education.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP41_08

MEAL PLANNING TOOL: A POTENTIAL TOOL TO REDUCE MENTAL BURDEN AND PROMOTE HEALTHIER DIETS IN THE GENERAL POPULATION?

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BACKGROUND AND OBJECTIVES

Meal planning is one of the components of food literacy, which encompasses the knowledge, skills, and behaviours necessary to plan, select, prepare, and consume healthy foods. Although meal planning has been suggested as an efficient practice to overcome some barriers to healthy eating, data in the literature are still scarce on the impact on diet. Many studies has demonstrated the benefice of such strategy to help people with food restrictions related to specific diseases such as diabetes, but few have been performed in the general population. The aim of this study is to evaluate the use of a web-based meal planning tool, and the self-reported impact on meal organization, and diet quality.

METHODS

The meal planning tool is available online for free since 2013, with a new version available since July 2022. The later provides a 7 days meal plan consistent with food based dietary guidelines and including seasonal products. Users of the tool were invited via a recruitment pop-in to answer a web-based questionnaire, from the 3rd to the 13th of December 2024. Questions were about: individuals characteristics (sociodemographic, meal organization), use of the tool (history and frequency of using, functionalities…), satisfaction and self-reported impact on food habits and quality.

RESULTS

2,293 users answered the questionnaire (86% women, mean age: 49, 40% living with at least one children). 79% perceived thinking about and preparing the week's meals is a mental burden. Half of the sample were new users (first day of use), while the former users (N=1,054) was roughly divided in 2 between those using the tool for more than and less than a year. The main reasons for using the tool were: find recipes (61%), have a healthy diet (50%), manage meal organization (39%). Among the former users (N=1,054), 38% reported to follow the entire proposed meal plan, 26% to only follow certain days and 36% to only pick up some recipes. The main reported impacts were on food and cooking habits (facilitates day-to-day organization, decrease of the mental burden or stress related to food organization, increase motivation to cook) and diet quality (increase food variety and food quality). Positive impacts on specific food groups were also reported and, interestingly, users from less privileged socio-professional categories were more likely to declare an increase in fruits and vegetables consumption compared to other.

CONCLUSIONS

A web-based tool helping people to manage meal planning appears of interest to overcome barriers related to food preparation and promote healthy diet in the general population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP41_09

POSITIVE DEVIANCE HEARTH PROGRAM EVALUATION TO ASSESS IMPROVEMENTS IN UNDERWEIGHT AND MODERATE ACUTE MALNUTRITION IN CHILDREN 6-59 MONTHS OF AGE IN ZAMBIA

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BACKGROUND AND OBJECTIVES

Child malnutrition remains a major public health issue in Zambia, with 12% underweight and wasting reaching 8% in some provinces (GNR, 2020). World Vision Zambia is addressing this through the "Positive Deviance Hearth" (PDH) program (WVZ, 2021). PDH identifies "positive deviant" (PD), households with well-nourished children despite limited resources, and uses a formative research method called "Positive Deviant Inquiry" to identify what the PDs are doing to address the challenges contributing to malnutrition in the community (Pascale, 2010). These local solutions are designed into key messages related to feeding, caring, hygiene, and health-seeking behaviours. PDH rehabilitates underweight and moderate acute malnutrition (MAM) children without medical complications. Caregivers contribute local foods and cook a nutrient-dense meal that is fed to malnourished children as an extra meal for rehabilitation and they hear contextualized messages for 12-days.

METHODS

Data was collected using a mixed-METHODS approach using routine data by PDH volunteers in 9 districts. Children with Weight-for-Age Z-score (WAZ) <-1.0 and WAZ≥-2.0 and/or MAM (mid upper arm circumference (MUAC) <125mm and ≥115mm) without medical complications and who pass the appetite test were entered into PDH. Weight and MUAC measurements were taken on Day 1, 12, 30, and 90, with MUAC also measured at 6 and 12 months. Recovery from underweight was declared at Day 90 for children with WAZ≥-2.0 if admitted with WAZ<-2.0 or if children were admitted with WAZ<-1.0 and ≥-2.0, weight gain of ≥900g was the definition for recovery. Additionally, focus group discussions (FGDs) with 30 caregivers explored knowledge, attitudes, and practices gained through PDH.

RESULTS

In 2022-2023, 273 children were enrolled in PDH with a recovery rate of 77.3% (n=215) by Day 90. MAM prevalence dropped from 46.7% (n=172) on Day 1 to 7.5% (n=21) by Day 90 and 3.36% (n=4) by 6 months, and 0% at 1 year. Caregivers reported improved IYCF knowledge, cooking skills, and awareness of nutrient-dense local foods. Hearth sessions were valued for their practicality, cost-effectiveness, and positive impacts on both nutrition and community behavior.

CONCLUSIONS

PDH has significantly improved underweight, MAM rates, and caregiver practices, demonstrating the success of community-driven, food-based approaches in rehabilitating malnourished children. The program provides a model for scaling interventions across Zambia to achieve lasting health benefits.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 42 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP42_02

UPPER ARM LENGTH ALONG WITH MID- UPPER ARM CIRCUMFERENCE FOR WASTING DIAGNOSIS AND PREVALENCE ESTIMATION: SENSITIVITY AND SPECIFICITY IN 6–59-MONTHS-OLDCHILDREN

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BACKGROUND AND OBJECTIVES

Child wasting remains a significant global health challenge, necessitating timely detection for effective management. Our prior research demonstrated the potential of incorporating upper arm length (UAL) alongside mid-upper arm circumference (MUAC) to enhance the diagnosis and prevalence estimation of wasting. This study aimed to evaluate the reproducibility of this approach using data from a second cross-sectional survey in Mauritania.

METHODS

UAL and standard anthropometric measurements were collected during two separate nutritional surveys conducted in Mauritania. In the initial survey, children were grouped into three UAL categories (UALG1: ≤150 mm, UALG2: 151–180 mm, and UALG3: ≥181 mm). Receiver Operating Characteristic (ROC) curves were used to identify optimal MUAC cut-offs for each group, with weight-for-height Z-score (WHZ) as the reference standard. Wasting prevalence, sensitivity, and specificity were compared across diagnostic METHODS. Identical MUAC cut-offs were applied to the second survey to assess the repeatability of findings.

RESULTS

The first survey included 12,590 children, with wasting prevalence rates of 16.1% (WHZ <−2), 5.0% (MUAC <125 mm), and 12.5% (MUAC–UALG). The MUAC–UALG method increased sensitivity for wasting diagnosis from 17.98% (MUAC <125 mm) to 39.43%, albeit with a decrease in specificity from 97.49% to 92.71%. Comparatively, the MUAC-height Z-score method (MUAC <138 mm) yielded a sensitivity of 69.76% and specificity of 75.64%. RESULTS from the second survey, assessing the method's replicability, will be presented during the conference.

CONCLUSIONS

The integration of UAL into MUAC measurements enhances the diagnostic accuracy for child wasting and provides a more reliable estimate of prevalence. This approach shows promise for rapid nutritional assessments in emergency contexts. The replicability of these findings using data from the second survey will offer further insights into the method's robustness.

CONFLICTS OF INTERESTS

Mouhamed Barro worked for Nutrition S.A.S France, a nutritional supplement and Ready to use therapeutic food producer.

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OAP42_04

FOOD INSECURITY, PSYCHOSOCIAL HEALTH AND ACADEMIC AND/OR RESEARCH PROGRESSION AMONG THE SPANISH SUB-COHORT OF THE FINESCOP STUDY

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BACKGROUND AND OBJECTIVES

Food insecurity (FI) is associated with poorer mental health and academic outcomes among university students (Bruening et al., 2018). However, the specific pathways through which FI may affect academic performance remain underexplored (Raskind et al., 2019). For this reason, we examined whether psychosocial health mediates the association between FI and changes in academic and/or research progression (ARP) in a sample of university students.

METHODS

This study is part of the Food Insecurity among European University Students during the COVID-19 Pandemic (FINESCOP) project, an observational, cross-sectional investigation of students enrolled in European universities, which aimed to better understand the vulnerable and challenging situation that students were experiencing during the COVID-19 pandemic. This abstract presents part of the RESULTS registered at a Spanish university and includes socio-demographic and economic data, perceived stress (Remor, 2006), hope (Synder, 1996), ARP (Mahdy, 2020), and FI status (Ballard et al., 2013). A total of 422 students completed the survey, using the Qualtrics software (Provo, UT, USA). The recruitment and data collection were conducted between December 2021 and January 2022. Univariable analysis and binary logistic regressions adjusted by sociodemographic and economic characteristics, and field of education were applied. In addition, Sobel-Goodman tests were conducted to rigorously assess mediation.

RESULTS

Overall, 18.6% of university students were food insecure**.** FI was associated with a worsening ARP (OR 1.75, 95% CI 1.66−1.84, $p<0.001$) and with perceived stress (OR 1.05, 95% CI 1.04−1.06, $p<0.001$) and hope (OR 0.94, 95% CI 0.94−0.95, $p<0.001$). The indirect association of FI status on ARP (worsening), as mediated by psychosocial health, was significant (B 0.19, 95% CI 0.09−0.31, $p<0.05$). According to the mediation percentages, hope can explain 54.6% of the association between FI and ARP.

CONCLUSIONS

This study provides evidence that the experience of FI hinders ARP through its harmful consequences on psychosocial health (being hope a protective factor in this relationship). These findings highlight the need for support programs and institutional and governmental policies that strengthen protective factors in ensuring food security among university students.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP42_05

DIETARY EVOLUTION PROFILES AND THEIR VARIATION IN NUTRIENT INTAKE ADEQUACY

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BACKGROUND AND OBJECTIVES

Changes in dietary intake play a significant role in long-term health, and nutrient intake adequacy has been identified in the population. These patterns of change have shown significant transitions in plant and animal shares. The lower consumption of animal products known for their nutrient richness could endanger the nutritional status of these populations. Some transitions could thus be associated with deficiencies in certain nutrients and excessive consumption of other nutrients. Therefore, this study aimed to estimate the adequacy of nutrient intake for different dietary change profiles.

METHODS

Our study is based on data from a subsample of 17,187 individuals who completed at least two of the three food frequency surveys in 2014, 2018, and 2022. Food trajectory profiles were identified using the multi-trajectory modeling method based on factors from a Principal Component Analysis of consumption data adjusted for total energy intake. The adequacy of nutrient intakes for each profile and each frequency period was analyzed using the probabilistic method. Similarly, the PANDiet and SecDiet were calculated to obtain an overall view of nutritional adequacy and nutritional security.

RESULTS

Six dietary change profiles were identified in the population with varying initial diets and evolutions (Average, Traditional, Fast Food, Healthy, Aged/Vegetarian, Risky). The Healthy and Aged/Vegetarian profiles have the highest PANDiet, and the Risky and Fast Food profiles have the lowest PANDiet. Conversely, the Healthy profile has the lowest SecDiet. PANDiet and SecDiet scores vary similarly between profiles, with some stability across the population. The probability of inadequacy of bioavailable zinc intake increases for all profiles except for the Healthy profile, which has a bell-shaped curve. The probability of inadequacy of bioavailable iron intakes decreased significantly in 2018 but increased again across all profiles in 2022. The Health profile has the highest probability of inadequacy in vitamin B12 and the lowest probability of inadequacy in fiber, alpha-linolenic acid.

CONCLUSIONS

From the analysis of dietary change profiles, we report that the changes in nutrient adequacy are similar. However, the nutritional risk is different initially, depending on the profiles. Overall, two profiles (Health and Aged/Vegetarian) have a better quality nutrient profile. The analysis of recent changes in diet allows us to specify the nutritional risk and its evolution for different types of consumption profiles and understand its determinants.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP42_07

DETERMINANTS OF SCHOOLCHILDREN'S FOOD CHOICES IN TUNISIA AND LEBANON: A COMPARATIVE ANALYSIS USING A GAMIFIED CHOICE EXPERIMENT

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BACKGROUND AND OBJECTIVES

In the MENA region, school-aged children face a dual burden of malnutrition within rapidly transitioning food environments. Understanding the determinants of food choices in this population is essential to inform effective interventions to promote healthier eating behaviors. This study investigates how scenario attributes (peer/parental modeling, food placement, preparation time, and food price), alongside socioeconomic, behavioral, and contextual variables, determine schoolchildren's food choices in Tunisia and Lebanon.

METHODS

Using data from the School and community drivers of child diets in two Arab cities (SCALE) study, we examine 119,772 food choice occasions in Tunisia and 64,152 in Lebanon, collected from 2,441 and 2,065 schoolchildren, respectively, through a gamified choice experiment. The experiment simulated real-life food choice scenarios across various settings (home, school, and neighborhood) and nodes (breakfast, recess, lunch, snack, and dinner) where children were presented with nine food items categorized into three levels of healthiness (healthy, medium healthy, and unhealthy). We used population-averaged logit models with applied weights to estimate choice probabilities by scenario attributes. We used post-estimation analyses to explore the predicted probabilities of choosing specific food types across different covariate levels and constructed profiles combining significant covariates to assess their cumulative effects on the outcome.

RESULTS

Scenario attributes such as food placement and preparation time significantly influence food choices in both countries. Harder-to-reach unhealthy food items are less likely to be chosen compared to easy to reach unhealthy food items Lebanon (OR=0.65; 95% CI: 0.61–0.69) and Tunisia (OR=0.85; 95% CI: 0.81–0.89). Behavioral variables (nutrition knowledge, physical activity, diet diversity) and contextual factors (eating in front of screen, purchasing food in/outside school) also significantly altered food choice probabilities, with varied effects across contexts and food healthiness. Post-estimation analyses are underway to explore cumulative effects of these factors.

CONCLUSIONS

This analysis contributes to our understanding of the determinants of food choices among schoolchildren in Tunisia and Lebanon. It also provides insights for evidence-based recommendations for context-specific interventions aimed at addressing the key drivers of healthy food choices, ultimately improving childhood nutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP42_08

EXAMINING THE RELATIONSHIP BETWEEN DIET COSTS AND DIETARY INTAKES AMONG CANADIAN ADULTS

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BACKGROUND AND OBJECTIVES

Dietary risk factors including inadequate intakes of fibre, fruits, and vegetables, and excess sodium, processed meats, and caloric beverages, are leading causes of premature death and disability according to the Global Burden of Disease study (1). Diet costs have been shown to influence dietary adequacy (2-6). This is the first population-representative study to examine the relationship between diet costs and dietary adequacy among Canadian adults.

METHODS

Weighted cross-sectional data using a single 24-hour dietary recall from the 2015 Canadian Community Health Survey–Nutrition, Canada's most recent population-representative nutrition survey administered by the federal government, was analyzed. Energy density and gram weight of intakes of total fibre, sodium, fruits, vegetables, processed meats, and caloric beverages, were estimated for adults 19 and older in the ten provinces (n=12,268 weighted to represent 24.4 million Canadian adults). Food prices from the Canadian Consumer Price Index program were matched to intakes to estimate individual daily diet costs ($CAD/day). Multivariate linear regression was used to estimate significant associations ($p<0.05$) between tertiles of daily diet costs, and energy density and gram weight of intakes, while controlling for socio-demographic factors comprising independent influences on food expenditure and energy intake for the gram weight intakes. Sensitivity analyses examined the impact of energy adjustment in diet cost estimation.

RESULTS

Daily diet costs varied significantly, from an average of $4.9/day in the lowest tertile of diet cost to $16.5/day in the highest tertile. The tertile with the highest diet cost was comprised of a greater proportion of males (as compared to females) and those of higher household income (as compared to lower household income) as compared to the lowest tertile of diet cost. In the final adjusted model, those in the highest tertile of daily diet cost had significantly lower energy density (kcal/g) of the diet, but also, higher intakes (grams) of sodium and vegetables, as compared to those in the lowest tertile of diet cost. No significant differences were noted for caloric beverages, processed meats, fibre, and fruits, but some differences were noted within sociodemographic strata.

CONCLUSIONS

Higher diet costs were associated with both the consumption of foods that can reduce the burden of diet related diseases as well as those that exacerbate the burden. Continued monitoring and surveillance measures are needed to examine how consumers make food purchasing and consumption decisions within a given diet cost.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP42_09

DIFFERENCES IN HIGH QUALITY PROTEIN INTAKE, FISH AND PROCESSED MEAT BETWEEN ETHNIC MINORITIES IN THE UK IS NOT FULLY EXPLAINED BY SOCIOECONOMIC DISADVANTAGE – DATA FROM THE UK BIOBANK

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BACKGROUND AND OBJECTIVES

Ethnic minority groups in the UK (South Asian, black African, and Caribbean) face health disparities, poorer overall health, greater socioeconomic disadvantages, and higher levels of deprivation compared to the white British group1.Nutritional habits, including adequate intake of fish2 and high-quality protein3, as well as limiting processed meat intake4, play a key role in healthy ageing by helping to prevent age-related malnutrition and muscle loss. As part of a larger research study to improve nutritional health in older adults [TANGERINE: nuTritional heAlth aNd aGeing in oldER ethnIc miNoritiEs.(https://www.bournemouth.ac.uk/research/projects/tangerine)], this research aimed to identify key factors influencing high-quality protein intake for healthier ageing in ethnic minorities using data from UK Biobank5.

METHODS

We grouped high-quality protein foods (poultry, beef, pork, oily fish, non-oily fish, cheese) to estimate weekly consumption, and compared it to the recommended intake of 2-3 portions/day6. Logistic regression was used to assess the association between ethnic groups and meeting dietary recommendations, adjusting for age, sex, Townsend index, and household income. We repeated the analysis for fish intake, (≥2 portions/week7), and processed meat (≤2 portions/week8) intake.

RESULTS

The odds of meeting high-quality protein intake recommendations, was higher in African and Bangladeshi and lower in Indian and Pakistani, than the white group. Adjusted odds ratios (ORs) [95% CI] were: African 2.56 [0.88, 1.20], Bangladeshi 2.20 [1.31, 3.70], Indian 0.65 [0.55, 0.77], Pakistani 0.62 [0.46, 0.85], and Caribbean 1.03 [0.88, 1.20]. Compared to the white group, Indian (0.32 [0.30, 0.74]) and Pakistani (0.65 [0.56, 0.74]) had lower ORs of meeting weekly fish recommendations, while Caribbean, African, and Bangladeshi had higher ORs after full adjustment. For processed meat, all ethnic minority groups had lower ORs than the white group: Caribbean 0.58 [0.53, 0.63], African 0.56 [0.51, 0.62], Indian 0.35 [0.32, 0.38], Pakistani 0.50 [0.44, 0.57], and Bangladeshi 0.36 [0.24, 0.52].

CONCLUSIONS

The findings suggest differences in fish, processed meat and protein intake between different ethnic groups compared with the white majority group. There is a need for interventions addressing the ethnic-specific cultural and socioeconomic factors that influence dietary patterns to inform policies aimed at supporting healthy ageing in ethnic minorities. Project funded by a grant from the MRC/UKRI (MR/Y010752/1).

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 44 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP44_01

ASSOCIATIONS BETWEEN FAT-SOLUBLE VITAMIN AND MINERAL INTAKE AND DENTAL CARIES AMONG CHILDREN AND ADOLESCENTS IN THE UNITED STATES, NHANES 2011-2018

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BACKGROUND AND OBJECTIVES

Historic research shows that a diet rich in calcium, phosphorus, fat-soluble vitamins, and vitamin C, and low in phytates may help to prevent and arrest dental caries; yet current research on this topic is scarce. We examined associations of dietary intake of these nutrients with dental caries prevalence in youth.

METHODS

The study included 2,676 young children (1–5 years), 3,214 older children (6–11 years), and 3,701 adolescents (12–19 years.) from the National Health and Nutrition Examination Survey 2011–2018. Nutrient intake was ascertained via two 24-hour recalls. We assessed the number of decayed and/or filled teeth (DFT) among young children and decayed, missing, and/or filled teeth (DMFT) among older children and adolescents. We also assessed the presence of DFT or DMFT (yes/no). Covariate-adjusted survey-weighted negative binomial regression examined associations of nutrient quartiles with DFT or DMFT scores. We examined joint associations of nutrients with the probability of caries using the probit extension of Bayesian Kernel Machine Regression.

RESULTS

Dental caries prevalence among young children, older children and adolescents was 17.43%, 50.65%, and 56.25%, respectively. Mean (SD) DFT or DMFT scores were 0.82 (2.23) for young children, 2.08 (2.81) for older children and 2.51 (3.35) for adolescents. Higher phosphorus, vitamin A, and phytate intake was associated with fewer DFT among young children (IRR= 0.60, 95% CI: 0.37 to 0.95, $p = 0.03$; IRR= 0.52, 95% CI: 0.29 to 0.94, $p = 0.03$; and IRR= 0.37, 95% CI: 0.21 to 0.65, $p = 0.001$, respectively). Higher phosphorus and vitamin E intake was associated with fewer DMFT among older children (IRR = 0.58, 95% CI: 0.40 to 0.84, $p = 0.03$ and IRR = 0.73, 95% CI: 0.54 to 0.97, $p = 0.03$, respectively). For adolescents, higher phosphorus and vitamin K intake was associated with fewer DMFT (IRR = 0.72, 95% CI: 0.53 to 0.99, $p < 0.05$; IRR= 0.82, 95% CI: 0.67 to 1.00, $p = 0.05$, respectively). The nutrient mixture was associated with lower odds of DMFT. Nutrients at their 75th relative to 50th percentiles were associated with 0.87 (95% CrI: 0.81, 0.94) and 0.92 (95% CrI: 0.85, 0.99) lower odds of DMFT in older children and adolescents, respectively. Phosphorus and vitamin K contributed most to these associations.

CONCLUSIONS

Fat-soluble vitamins and phosphorus may have systemic dental benefits that warrant further investigation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP44_03

N–6 AND N–3 FATTY ACID INTAKES AND PROPORTIONS IN SERUM AMONG FINNISH CHILDREN ON VEGAN, VEGETARIAN AND OMNIVORE DIETS

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BACKGROUND AND OBJECTIVES

Vegan diets are rich in the essential fatty acids (EFA) linoleic (LA, 18:2n-6) and α-linolenic (ALA, 18:3n-3) acids, but the intake of long-chain (LC) n-3 fatty polyunsaturated fatty acids (PUFA) eicosapentaenoic (EPA, 20:5n–3) and docosahexaenoic (DHA, 22:6n–3) acids is negligble without supplementation. In the absence of preformed EPA and DHA, the individual is dependent on the conversion from ALA. Dietary LA to ALA -ratio may affect the conversion efficiency. We studied the intake and status of EFAs and their LC derivatives arachidonic acid (AA, 20:4n-6), EPA and DHA in Finnish children on vegan, vegetarian or omnivore diets.

METHODS
The cross-sectional MIRA2 study collected data in 2021–22 among daycare-aged (2–7 y) children and their caregivers. Three-day food records and fasting serum samples were obtained from 65 children (n= 25, 16 and 24 following vegan, vegetarian and omnivore diets, respectively). Serum total FAs (weight-%) were analyzed with gas-liquid chromatography. Differences between groups were tested with Wilcoxon signed-rank test with false discovery rate adjustments ($p<0.01$ for all present differences). RESULTS are given as median (25–75 percentiles).
RESULTS
Fat intakes were 32 % of energy (E%) in all groups. The intakes of LA [6.4 (5.8–7.5) vs. 3.9 (3.3–4.4) E%] and ALA [1.5 (1.3–1.9) vs. 1.0 (0.8–1.2) E%] were higher, and those of EPA [0 vs. 16.6 (7.5–92.5) mg/d] and DHA [0 vs. 58.0 (14.7–262.3) mg/d] lower in the vegan group than in the omnivore group, respectively. The LA to ALA intake ratios did not differ between the groups (medians 3.7 to 4.0). Serum FAs in the vegan group contained less saturated FAs and more PUFAs. The proportions of serum LA and ALA were higher [32.6 (31.3–33.5) and 1.2 (1.1–1.5) %] and DHA lower [1.5 (1.2–1.6) %] in the vegan group than in the omnivore group [29.5 (27.5–32.3), 0.9 (0.7–1.0) and 2.3 (1.8–2.6) %, respectively]. No differences in AA or EPA were seen. The serum ratio of n–6 to n–3 PUFA was higher in the vegan group [10.3 (9.4–11.4)] than in the omnivore group [8.0 (7.1-9.6)]. The vegetarian group RESULTS tended to fall between the vegan and omnivore groups.
CONCLUSIONS

The dietary intakes of LA and ALA were sufficient, and their dietary ratios were balanced in all groups. The higher intakes of LA and ALA from vegan diets was reflected in serum FAs. ALA may be efficiently converted to EPA in children following a vegan diet, but the serum DHA levels are low compared to children on omnivorous diets. Whether the serum DHA proportions reflect adequate status should be investigated further.

CONFLICTS OF INTERESTS
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OAP44_04

OPPOSING EFFECTS OF SELENIUM AND COPPER ON SARCOPENIA IN INSTITUTIONALIZED OLDER ADULTS

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BACKGROUND AND OBJECTIVES

Older adults are more susceptible to exposure to various toxic and essential metals, which play different roles in diseases, and nutritional status during the aging process. Deficiencies in essential elements have been associated with sarcopenia, cognitive decline, and loss of functionality. Selenium is well-regarded for enhancing muscle function, particularly due to its antioxidant properties. In addition, studies showed the impact of serum copper on muscle loss. Concomitant in this scenario, exposure to toxic elements is a risk factor for accelerated DNA methylation aging, worsening the predisposition for many diseases.

METHODS

A cross-sectional study was conducted with 149 institutionalized older adults living in Natal city, Brazil. Plasma Se, zinc (Zn), Cu, arsenic (As), cadmium (Cd), nickel (Ni), and lead (Pb) levels were analyzed by inductively coupled plasma mass spectrometry, ICP-MS. European Working Group diagnosed sarcopenia on Sarcopenia in Older People (adapted). The criteria used were based on the discrimination of reduced concentrations of muscle mass (assessment of calf perimeter), associated with a reduction in strength (handgrip test) and/or functionality (walking speed test). The Mann-Whitney test and logistic regression model were applied in statistical analysis.

RESULTS

Long-lived older adults were predominant in a sample of the study, being the majority of females and residents in non-profit nursing homes. Concerning anthropometric parameters, the participants were predominantly classified as underweight. Se plasma levels [(mean) (SD)] were 92.62 (30.2) µg/L and Cu plasma levels were 1403.00 (383.1). Higher plasma Se decreased the chance of sarcopenia (OR=0.975, 95%CI=0.956 to 0.994), while sarcopenia was more prominent through increased copper (OR=1.002, 95%CI=1.001–1.004). The other elements did not show significant associations between the variables tested.

CONCLUSIONS

Se status is positively associated with sarcopenia in older adults, and Cu showed harmful effects. The importance of nutritional supply with these elements in the older adult population is highlighted, aiming at improving muscle health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP44_05

COMPARISON OF INTRAVENOUS IRON SUCROSE AND FERROUS CARBOXYMALTOSE IN MANAGEMENT OF ANEMIA IN PREGNANCY: FINDINGS FROM THE PRISMA STUDY

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BACKGROUND AND OBJECTIVES

Iron deficiency anemia (IDA) is one of the most common causes of anemia, accounting for about half of the cases of anemia during pregnancy [1]. The National Nutrition survey from Pakistan reported that 21% of pregnant women had IDA, with a slightly higher proportion from rural as compared to urban areas [2]. Despite the higher efficacy and tolerance of intravenous (IV) iron compared to oral formulations, there is a lack of consensus about using as priority treatment of IDA in pregnant women. This study aimed to assess the effectiveness of intravenous iron sucrose (IS) as compared to ferrous carboxymaltose (FCM) in iron-deficient versus non-iron-deficient (non-IDA) pregnant women in the PRISMA cohort.

METHODS

This secondary analysis leverages data of pregnant women from PRISMA (Pregnancy Risk Infant Surveillance, and Measurement Alliance). All women who enrolled before August 2024 and received at least one dose of IS or FCM were included in the analysis. Anemia was categorized into mild, moderate, and severe using the World Health Organization classification of anemia in pregnancy by trimester [3]. Iron deficiency was defined as ferritin levels of 15 ng/ml. We used linear regression to compare the effects of FCM and IS treatment and evaluated potential effect modification by IDA status.

RESULTS

This analysis includes 439 women with IDA while 212 women had non-IDA. The mean gestational age in weeks for the first dose of iron was 27 (SD 7) and 28(SD 7) weeks respectively. Among those with IDA, 324 (74%) women received FCM while 115 (26%) received IS; in the non-IDA group, 169 (78%) women received FCM and 43 (22%) received IS. On average, participants treated with FCM had larger increases in hemoglobin after treatment (0.30g/dL) compared to those treated with IS after adjusting for pre-treatment hemoglobin; participants treated with FCM also had a 16-percentage point greater decrease in the prevalence of moderate to severe anemia over those treated with IS, adjusting for pre-treatment prevalence (Table 1). We found no significant difference in the effect of FCM vs. IS treatment by IDA status.

CONCLUSIONS

A single dose of IV iron significantly reduces moderate and severe anemia, with a more pronounced effect observed in those receiving FCM compared to those receiving IS. Given the high burden of anemia, recommendations regarding management using IV iron such as FCM need to be reconsidered for effective management of this condition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP44_06

DIETARY COMPOSITION IS RESPONSIBLE FOR LOW NUTRITIONAL QUALITY AND HIGH ENVIRONMENTAL FOOTPRINT OF FOODSERVICE IN GERMAN HEALTHCARE INSTITUTIONS

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BACKGROUND AND OBJECTIVES

Foodservice in healthcare settings substantially influences the health of patients and residents, and also contributes to institutions' environmental footprint. There is hardly any data on the current status of foodservice in healthcare institutions in terms of dietary quality and sustainability, hindering its recognition as an important field of action. This study aims to provide a comprehensive assessment of the healthiness, nutritional adequacy and the environmental footprint of foodservice in German healthcare institutions.

METHODS

Two hospitals and three nursing homes from different regions in Germany were included in the study. We collected meal plans and recipes to assess 1) the overall healthiness of food composition, using the Healthy Eating Index-2020, 2) adherence to the Planetary Health Diet (PHD), using the PHD Index and 3) the nutritional adequacy of food provision, using the German nutrient database. To assess the environmental footprint, annual food procurement data were matched with a life-cycle analysis database to assess 50 food groups´contribution to greenhouse gas emissions, land use, eutrophication and acidification potential, and water use.

RESULTS

The majority of calories served were from animal-source foods, refined grains and sugar, resulting in low scores in the Healthy Eating Index-2020 and low adherence to the PHD. Wholesome plant-based foods made up less than 20% of calories in all institutions. Meals were low in fiber and high in saturated fat and salt, and nutrient provision was consistently low for vitamin C, several B vitamins, potassium and magnesium. In addition, protein supply was insufficient in nursing homes. The environmental footprint of food procurement was largely driven by a few animal-source foods, namely red meat and dairy products. Almost two-thirds of procured protein was from animal-source foods, while legumes made up <1% of procurement.

CONCLUSIONS

Our study shows drastic shortfalls in dietary quality and sustainability of healthcare foodservice, highlighting an urgent need for action. Decision-makers need to prioritize and develop foodservice changes that address both individual and planetary health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP44_07

MENTAL HEALTH AND GESTATIONAL WEIGHT GAIN: A COMPARISON BETWEEN BRAZILIAN COHORTS

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BACKGROUND AND OBJECTIVES

The mental health of pregnant women is critical as it influences both maternal and neonatal outcomes. This study investigates the association between maternal mental health and gestational weight gain (GWG) in two Brazilian cohorts conducted in different periods.

METHODS

The Jundiaí cohort (1997-2000) included 875 pregnant women, while the Araraquara cohort (2017-2024) evaluated mental health of 556 pregnant women from 2017 to 2019. Maternal mental health was assessed using the General Health Questionnaire (GHQ), the State-Trait Anxiety Inventory (STAI), and the Perceived Stress Scale (PSS) during the first, second, and third trimesters. GWG was categorized as adequate, insufficient, or excessive based on Institute of Medicine guidelines. Statistical analysis included bivariate tests (Kruskal-Wallis, chi-square, or Fisher's exact test) and multinomial ordinal logistic regression to evaluate associations.

RESULTS

: In the Jundiaí cohort, high stress levels in the first trimester were associated with lower odds of insufficient GWG (adjusted OR for second quartile: 0.36, 95% CI: 0.18-0.71). In the second trimester, high anxiety levels (TAI ≥ 40) were associated with higher odds of insufficient GWG (adjusted OR: 1.76, 95% CI: 1.12-2.76). In the third trimester, high stress levels (PSS fourth quartile) were associated with higher odds of insufficient GWG (adjusted OR: 1.72, 95% CI: 1.02-2.91). In the Araraquara cohort, no significant associations between mental health and GWG were found.

CONCLUSIONS

Our findings highlight the importance of incorporating psychosocial support in prenatal care to improve maternal and neonatal outcomes. Variations in socioeconomic and temporal contexts may influence the relationship between mental health and GWG. Future research should explore the underlying mechanisms and develop interventions tailored to different socioeconomic and temporal contexts.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP44_08

DEVELOPMENT AND VALIDATION OF A FOOD FREQUENCY QUESTIONNAIRE TO ASSESS DIETARY IRON, FOLATE, AND VITAMIN B12 INTAKE IN WOMEN

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BACKGROUND AND OBJECTIVES

Micronutrient deficiencies, particularly those of iron, folate, and vitamin B12, remain a significant global public health concern, especially among women of reproductive age. Accurate assessment tools are crucial for evaluating dietary intake and identifying populations at risk. This study aimed to develop a food frequency questionnaire (FFQ) tailored to assess dietary intake of iron, folate, and vitamin B12 in women and to evaluate its validity and reliability.

METHODS

The validity was assessed using 24-hour dietary recalls and biochemical parameters, while reliability was tested through repeated applications. Initially, 445 non-pregnant women aged 19–50 participated, but 25 were excluded due to medical conditions affecting diet, adherence to specific diets (e.g., gluten-free, vegetarian, weight-loss), or incomplete surveys, leaving 420 participants. The questionnaire, including sections on general information, health status, 24-hour dietary recall, and dietary intake of the target nutrients, was administered face-to-face. Biochemical data from 100 participants were collected at Hacettepe University Family Medicine Clinics.

RESULTS

Correlations between the FFQ and dietary recalls showed significant relationships for iron ($p<0.001$) and folate ($p<0.001$), but not for vitamin B12 ($p=0.058$). Biochemical validation revealed significant correlations only for vitamin B12 intake and serum levels ($p=0.001$). Bland-Altman analysis supported the validity of B12 assessments ($p<0.001$).

Reliability testing demonstrated strong correlations between repeated FFQs for iron ($p<0.001$), folate ($p<0.001$), and vitamin B12 ($p<0.001$).

CONCLUSIONS

These findings suggest the FFQ is valid for assessing iron and folate intake through dietary recalls and reliable for all three nutrients. In conclusion, the developed FFQ is a practical and reliable tool for evaluating dietary intake of iron, folate, and vitamin B12 in women, with potential applications in nutritional research and public health interventions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP44_09

IMPACT OF A DIETARY GUIDELINES BOOKLET FOR PREGNANT MOTHERS ON THEIR NUTRITIONAL STATUS

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BACKGROUND AND OBJECTIVES

Despite the availability of several nutrition interventions, maternal nutritional problems remain public health concerns in Sri Lanka due to unhealthy dietary choices, highlighting the need to improve dietary awareness for pregnant mothers. This study aimed to evaluate the impact of a developed dietary guidelines booklet for pregnant mothers on their nutritional status.

METHODS

A developed dietary guidelines booklet for pregnant mothers includes appropriate food consumption, incorporating locally available and nutritious foods. The impact of the booklet was assessed through pre- and post-intervention assessments. Fifty-six pregnant mothers in their second trimester attending Maternal and Child Health (MCH) clinics in Pannala were recruited as the intervention group, while 56 pregnant mothers from Kuliyapitiya clinics were the control group. The intervention group received the developed dietary guideline booklet and explanations, while the control group received only routine nutrition information from MCH clinics. Baseline data on socio-demographics, nutrition knowledge, anthropometric measurements, biochemical parameters and dietary information were collected. At the last clinic visit, all the information except sociodemographic data was collected. Nutritional status was assessed based on pre-pregnancy body mass index (BMI), dietary intake of nutrients, and biochemical parameters, including urinary iodine, total protein, albumin, haemoglobin, and zinc. The nutrient intake of participants was identified using Food-Base 2000 software. Statistical analysis was performed using SPSS version 23.0 at $p < 0.05$ significance. At the end of the interventions, the differences within groups and between two groups were calculated using dependent and independent t-tests, respectively.

RESULTS

At baseline, there were no statistically significant differences in socio-demographic and nutritional status between the intervention and control groups ($p < 0.05$). A significant increase in the intake of micronutrients by mothers in the intervention group, such as iron ($p = 0.001$), iodine ($p = 0.036$), and folic acid ($p = 0.001$) compared to the control group. The biochemical parameter assessment, serum albumin ($p = 0.000$), urinary iodine ($p = 0.003$), and haemoglobin levels ($p = 0.007$) indicated that the intervention group had significant improvements in nutritional status as well.

CONCLUSIONS

The dietary guidelines booklet for pregnant mothers demonstrated its efficacy in positively impacting the nutritional status of pregnant mothers.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 45 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP45_01

HARMONISING POLICIES TO ADDRESS THE DOUBLE BURDEN OF MALNUTRITION: STAKEHOLDER INSIGHTS ON FOOD RETAIL IN SOUTHEAST ASIA

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BACKGROUND AND OBJECTIVES

Food retail policies play a pivotal role in shaping dietary behaviours and addressing the double burden of malnutrition, which contributes to rising rates of obesity and non-communicable diseases (NCDs). This study, as part of South East Asia Obesogenic Food Environment (SEAOFE) project, aims to identify facilitators and barriers in food retail policies and prioritise actions to improve access to affordable, healthy foods across Indonesia, Malaysia, the Philippines, and Thailand. This presentation will focus on findings from one of the participating Southeast Asian countries.

METHODS

A three-phase qualitative exploratory approach was adopted. Phase I involved document analysis of food-related policies from various ministries, focusing on sectors such as food, health, nutrition and retail. In Phase II, in-depth interviews were conducted with key stakeholders to assess implementation of food retail policies, using policy space analysis to identify facilitators and barriers. Phase III engaged stakeholders in deliberative workshop to prioritise policy recommendations based on concerns and feasibility of implementation. Thematic analysis was used to extract codes from policy documents, interviews, and workshops, focusing on facilitators, barriers, stakeholder concerns, decision-making processes, and implementation challenges.

RESULTS

In total, 41 food-related policy documents from 25 ministries were reviewed, highlighting areas such as food safety, health, hygiene, nutrition, and retail business operations. Key facilitators included cross-sector collaboration and regulatory development, while barriers involved gaps in food standards, enforcement coordination and limited consumer awareness. The deliberative workshop underscored the need for cross-sectoral collaboration, revealing both shared goals and diverging priorities among stakeholders. While all parties agreed on promoting affordability and consumer education, they differed in regulatory focus, market flexibility, and balancing interventions with market dynamics. Insights from Southeast Asian countries highlighted common challenges, such as regulatory ambiguities and market pressures, with strategies varying depending on local contexts.

CONCLUSIONS

These findings provide actionable guidance for future policy revisions to address the double burden of malnutrition in Southeast Asia and beyond.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP45_02

THE NATURE AND FREQUENCY OF FOOD AND BEVERAGE MARKETING ON KENYAN NATIONAL TELEVISION: A MIXED-METHOD ANALYSIS OF FOOD ADVERTISEMENTS, PARENT AND CHILDREN'S PERSPECTIVES

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BACKGROUND AND OBJECTIVES

Exposure of children and adolescents to unhealthy food through advertisements on television (TV) is associated with increased consumption of unhealthy foods and subsequently, overweight/obesity and diet related non-communicable diseases (NCDs). This study assessed the nature, frequency and exposure of children to food and beverage advertisements on TV and the perspectives of children/adolescents and parents on TV food advertisments.

METHODS

Mixed METHODS; nationally representative study, guided by the International Network for Food and Obesity / NCDs Research, Monitoring and Action Support (INFORMAS) protocol for monitoring food promotion. This entailed simultaneous recording of the three most popular national TV channels in Kenya for eight randomly selected days, 18 hours/day, over a three-month period in 2021-22. The NOVA classification was used to categorise foods advertised based on level of processing. The Kruskal Wallis test was used to compare the advertisement rates of the four NOVA food group advertisements by TV channels, peak times, recording day (weekday/weekend), and season (holiday/non-holiday).Focus group discussions (n=14) and in-depth interviews (n=29) were conducted with school children/adolescents (~9-18 years) and parents respectively in three counties, to explore their perspectives on TV food advertisements. Data were coded in NVIVO and analyzed thematically.

RESULTS

Of the 3700 advertisements recorded, about a third (36%, n=1316) comprised of food and beverages, 94.7% (n=1213) were ultra-processed foods (UPFs), with a mean rate of 2.8 ads/channel per hour, the majority (95.9%, n=557) were broadcast during peak hours (6.00am-9.00pm). The children vividly remembered some of the advertised foods, mainly brands related to UPFs. Most parents acknowledged that their children paid attention to food advertisements and sometimes requested for these foods/brands. Parents generally considered food advertising safe with no concerns about unhealthy food exposure to children.

CONCLUSIONS

Exposure of Kenyan children and adolescents to unhealthy foods through advertisements on national TV is high. These advertisements enhance recognition and recall of the food brands, while parental knowledge and concern about unhealthy food advertising is limited. Policies restricting advertising of unhealthy foods accompanied by a nutrition education campaign are urgently needed to limit unhealthy food exposure and consumption by children and adolescents, to address the increasing burden of overweight/obesity and NCDs

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OAP45_03

DEMOCRATISING NUTRITION INFORMATION AND EDUCATION: A NEW NATIONAL DIGITAL TOOLBOX TO FEED AUSTRALIAN CHILDREN UNDER THE AGE OF 5

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BACKGROUND AND OBJECTIVES

Access to and availability of evidence-based nutrition information for feeding young children is inequitable and varies in quality. Identifying evidence-based nutrition information is challenging for consumers as there are many competing sources of advice. The first 2000 days of life provides a window of opportunity for influencing health trajectory. Many groups are involved in food provision for children under the age of 5, including parents/carers, health, and education professionals. The challenge of this project was to deliver a novel digital solution.

The aim was to co-design a national open-access digital repository of evidence-based nutrition resources and education for parents/carers and health professionals and create a suite of new resources to fill evidence gaps to support food and nutrition for the under 5's.

METHODS

User-centred design underpinned all aspects of development. End-users of this digital repository were defined as parents or carers of children <5 years of age, and health and education professionals working with families of children <5 years of age. A scoping review of existing online resources was conducted to determine the resources available to host in the digital repository. All resources retrieved were subjected to quality assessment and the currency of information was reviewed by a team of paediatric dietitians prior to their addition to the digital repository. Over 170 hours of co-design panels were completed with end-users and contributed to all aspects of the project.

RESULTS

The co-design panels contributed to the design, brand identity, and content of the resulting 'Grow&Go Toolbox'. The Grow&Go Toolbox houses over 2000 open access nutrition resources, with an intuitive search engine that ensures users can locate resources that meet their needs or find a relevant health professional for support. A series of free professional development podcasts for Early Childhood Education and Care workers supports the nutrition literacy of those working in childcare settings. A unique 'Personalise a Resource' Suite provides templates and digital assets for health professionals to create tailored resources for their clients with consideration of location, food availability, culture, and specific needs.

CONCLUSIONS

Grow&Go Toolbox provides a trusted source of evidence-based nutrition information for young children across Australia. This consumer-friendly digital resource hub has the capability to evolve and expand to help health professionals access quality resources for their clients. In its first 12 weeks of operation (2024), over 3000 users were recorded.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP45_04

FORTIFIED BALANCED ENERGY–PROTEIN SUPPLEMENTATION DURING PREGNANCY AND MATERNAL GESTATIONAL WEIGHT GAIN: A COMMUNITY-BASED RANDOMIZED TRIAL IN SOUTHERN NEPAL

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BACKGROUND AND OBJECTIVES

To assess whether gestational weight gain (GWG) differed between supplemented and non-supplemented women in a randomized controlled trial of fortified balanced energy protein (BEP) supplementation in pregnancy in Sarlahi, Nepal.

METHODS

The Maternal Infant Nutrition Trial (MINT) is a 2X2 factorial, household randomized efficacy trial to assess the impact of fortified BEP supplementation during pregnancy and lactation on birth outcomes and infant growth. The present analysis focuses on the pregnancy period, where women were randomized to receive either daily fortified BEP (15 micronutrients at 1RDA, ~400 kcal, 14.5g protein) or no supplement, with all women receiving antenatal standard of care, from 14 weeks of gestation to pregnancy outcome. GWG (kg) and rate of GWG (kg/wk) were secondary outcomes and defined as change in weight from enrollment to third trimester (~32 weeks). GWG adequacy was calculated as the observed weight gain from enrollment to third trimester divided by the expected weight gain according to the Institute of Medicine (IOM) 2009 guidelines and expressed as a percentage. GWG adequacy was categorized as: severely inadequate <70%; inadequate <90%, adequate 90-125%; and excessive >125%. Continuous and binary outcomes were analyzed using linear regression and log-binomial or Poisson regression models with robust standard error, respectively, comparing the BEP group to the no supplement group. Mean differences and relative risk ratios with 95% confidence intervals are presented as measures of impact.

RESULTS

In total, 1944 pregnant women were enrolled with a mean±SD gestational age of 9.2±2.9 weeks, and data from 1550 participants with a singleton live birth were analyzed. Baseline characteristics were similar across groups, with mean age of 24.5±3.5 years, 20.5±3.2 kg/m2 mean BMI and 45.1% reporting no formal education. The combined mean GWG from enrollment to the third trimester was 7.1±3.0 kg with a rate of 0.33±0.14 kg/week, with no differences between groups. Overall, 31.7%, 53.4%, and 14.7% of participants experienced severely inadequate, inadequate, or excessive GWG, respectively. Mean GWG percent adequacy by early third trimester was suboptimal at 85.7%±38.0 and 90.4%±39.9 in the no supplement and supplemented groups, respectively, resulting in a 4.8% difference between groups (95CI: 0.87, 8.74).

CONCLUSIONS

Fortified BEP supplementation compared to no supplementation in pregnancy improved gestational weight gain adequacy among pregnant women in rural Nepal.

CONFLICTS OF INTERESTS
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OAP45_05

EFFICACY OF FOODS AND NUTRIENTS TO IMPROVE INDICATORS OF SLEEP QUALITY: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

Diet, physical activity and sleep are three lifestyle pillars for health. While the interactions of diet and physical activity have been well investigated and promoted those of diet and sleep have been less explained. There is growing recognition that poor sleep is becoming a threat to the public's health. The objective of this systematic review was to examine the effectiveness of macronutrients, foods, and dietary patterns on components of sleep quality amongst a general adult population.

METHODS

The review was registered in PROSPERO CRD42024589004. Literature searches were conducted in five databases: Medline, Embase, PsycInfo, Web of Science and Cochrane Library on August 26, 2024. The eligible population were adults aged 18-65 years but those with diagnosed sleep disorders or chronic disease were excluded. Interventions included macronutrients, foods, or dietary patterns of any duration compared to usual diet or comparator intervention. Sleep outcomes included sleep onset latency, sleep efficiency, total sleep time, wake after sleep onset, number of awakenings and subjective sleep quality. Both randomised and non-randomised controlled trial study designs were included. Risk of bias in studies was assessed using the ROB-2 and ROBINS-I tools from the Cochrane collaboration. Data were extracted and synthesised narratively. All steps of the review were conducted in duplicate with a third researcher consulted if consensus could not be reached.

RESULTS

From 11,618 articles located only 36 studies with a total of 1086 participants met the inclusion criteria. Two of 3 studies showed positive effects of high glycaemic index diets on sleep latency as did 2 of 8 studies examining high carbohydrate meals. Consuming breakfast regularly, Jerte Valley cherry products and whey protein with galacto-oligosaccharides significantly improved all sleep quality outcomes ($p < 0.05$). Findings for 2 studies of kiwifruit produced equivocal RESULTS and 3 of 4 studies of EPA, DHA and Atlantic salmon found no effects. Proposed mechanisms of action are via the tryptophan, serotonin, melatonin pathways. Findings for tryptophan supplements are equivocal but exogenous melatonin in foods improves sleep indicators.

CONCLUSIONS

Preliminary evidence highlights the potential effectiveness of some macronutrient, food and dietary pattern interventions as an approach to improve sleep. Further research to understand the underlying mechanisms by which diet influences different components of sleep quality are indicated.

CONFLICTS OF INTERESTS

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OAP45_06

DRIVERS AND SOLUTIONS TO UNHEALTHY FOOD CONSUMPTION BY ADOLESCENTS IN URBAN SLUMS IN KENYA: A QUALITATIVE PARTICIPATORY STUDY

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BACKGROUND AND OBJECTIVES

Ultra-processing foods (UPFs) are associated with negative health impacts including cardio-metabolic and mental health risks among adolescents. There is a dearth of evidence on UPF consumption in Sub-Saharan Africa. This study explored the perceptions, drivers, and potential solutions to UPF consumption among adolescents in urban slums, Kenya.

METHODS

Qualitative participatory research, through participatory photography (photovoice) group discussions with adolescents 10-19 years (n=102) and community dialogues with adults (n=62) in three major urban slums in Kenya. The photography and subsequent discussions focused on i) causes and solutions to undernutrition and overweight/obesity among adolescents, ii) foods commonly consumed by adolescents, in urban slums. Inductive, thematic analysis was undertaken, upon which emerging themes on perspectives, drivers and solutions to UPF consumption were identified.

RESULTS

UPF consumption emerged as a predominant theme on the causes of undernutrition and overweight/obesity and foods commonly consumed by adolescents. Adolescents described UPF as junk, oily, sugary or foods with chemicals, and associated UPF consumption with undernutrition, obesity, non-communicable diseases. They perceived UPF as modern, urban, classy, appealing to young people and minimally processed foods as boring, primitive, for older people, and those in rural areas. Individual-level drivers of UPF consumption were organoleptic attributes (taste/aroma), body size/shape, illicit drug use, convenience, adolescents' autonomy. Social environment drivers were peer-pressure and social status/aspirations. Physical environment drivers were UPF availability and accessibility in the slums. Education on healthy eating and adverse effects of consuming UPF, through existing structures was proposed as potential solution to UPF consumption

CONCLUSIONS

UPF were perceived as associated with poor nutrition and health, yet were preferred over unprocessed/minimally processed foods. Interventions to promote healthy diets beyond raising awareness are important, while address the underlying perceptions and drivers of UPF consumption at individual-level, and social and physical food environments.

CONFLICTS OF INTERESTS
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OAP45_07

MONITORING THE NUTRITION INFORMATION AVAILABILITY AND QUALITY OF CANADIAN RESTAURANT MENU ITEMS BETWEEN 2010 TO 2024

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BACKGROUND AND OBJECTIVES

The increasing frequency of eating out at restaurants, coupled with the poor nutritional quality of restaurant foods, makes menu items an important point of intervention for improving population diet and health. However, restaurant foods have been largely overlooked in nutrition policies and research in Canada, which has often been attributed to the lack of quality data for monitoring the out-of-home food environment. The objectives were to assess changes in (a) the availability of nutrition information and (b) the nutritional quality of restaurant menu items in Canada between 2010 to 2024.

METHODS

Nutrition information for menu items from restaurants with 20 or more locations (the typical cut-off for menu labelling policies) was collected at five time points (2010, 2013, 2016, 2020, and 2024). Proportion of eligible restaurants reporting nutrition information, the number of restaurants and menu items included in the Menu-Food Label Information and Price (Menu-FLIP) database, and the percent market share represented by the database were reported. Nutritional quality was assessed by comparing mean serving sizes, calories, and nutrients-of-concern across years.

RESULTS

Proportion of restaurants reporting nutrition information increased over time, with 49% in 2010, 70% in 2020, and 76% in 2024. Correspondingly, the sample sizes of the Menu-FLIP database grew, with a two-fold increase in restaurants and approximately five-fold increase in menu items. Percent market share represented also grew from 42% in 2016 to >75% in 2024. Mean calorie levels per serving fluctuated over time, ranging from 392 in 2010, 489 in 2013, 449 in 2016, 483 in 2020, and 427 in 2024 (preliminary). Sodium, sugars, and saturated fat levels consistently exceeded Canada's 'high in' thresholds (15% Daily Value) across all years.

CONCLUSIONS

This study highlights progress in the availability of nutrition information for restaurant menu items in Canada, and the expansion of the Menu-FLIP database to include a larger, more representative sample. However, the absence of standardized reporting guidelines for menu nutrition information poses challenges for longitudinal monitoring, policy development, and evaluation. Additionally, the persistently poor nutritional quality of menu items highlights the need for robust nutrition policies targeting the restaurant sector. These findings underscore the importance of working towards a healthier out-of-home food environment to better support informed consumer choices and population health.

CONFLICTS OF INTERESTS

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OAP45_08

ASSOCIATION OF NUTRIENT INTAKE AND GESTATIONAL WEIGHT GAIN WITH GUT MICROBIOTA COMPOSITION IN PREGNANT WOMEN FROM A RURAL SETTING IN A LOWER-MIDDLE-INCOME COUNTRY

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BACKGROUND AND OBJECTIVES

Maternal gut microbiota composition plays a critical role in perinatal outcomes, yet its relationship with nutrient intake and gestational weight gain remains underexplored in low-resource settings. This study assessed the associations of nutrient intake and gestational weight gain patterns with gut microbiota composition in pregnant women.

METHODS

The study included a subsample of 47 pregnant women from the IMNiM study (NCT04868669), who provided fecal samples at 24, 28, 32, and 36 weeks of gestation. DNA was isolated from the fecal samples and shotgun sequencing was conducted using NovaSeq 6000 platform. Gordon Lab Metagenomic Assembly Pipeline was used to construct metagenome-assembled genomes (MAGs) and abundance tables were used for downstream association analyses. Usual dietary intake was assessed via a 7-day quantitative food frequency questionnaire in the first trimester and at 36 weeks of gestation, with nutrient values derived using the Food Composition Table for Bangladesh. The weekly rate of weight gain during pregnancy was categorized following the Institute of Medicine 2009 guidelines.

RESULTS

The women had a mean (SD) age of 23.9 (4.6) years and a BMI of 20.9 (2.1) kg/m² in the first trimester, with 13 (27.7%) being nulliparous. Using the assembly pipeline, 936 MAGs were identified. Significant associations were observed between nutrient intake and specific gut microbiota species, such as *Roseburia* and *Lachnospira*, which metabolize fermentable carbohydrates and produce metabolites like butyrate and acetate, influencing glucose metabolism. Gestational weight gain was associated with dynamic changes in MAGs over the weeks of pregnancy. The relative abundance of MAGs corresponding to *Akkermansia muciniphila*, *Bifidobacterium longum*, and *Ruminococcus D bicirculans* increased in the optimal weight gain group, while the abundance of *Escherichia coli*, *Acetatifactor sp.*, and *Agathobacter rectalis* increased in the inadequate weight gain group. In contrast, the abundance of several species, including *Akkermansia muciniphila* and *Ruminococcus D bicirculans*, significantly decreased in the excessive weight gain group.

CONCLUSIONS

This study highlights the influence of nutrient intake and gestational weight gain on maternal gut microbiota composition, underscoring the importance of targeted nutritional counseling and dietary interventions to optimize pregnancy outcomes through microbiome modulation.

CONFLICTS OF INTERESTS
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OAP45_09

CHILDHOOD GROWTH STUNTING IS ASSOCIATED WITH HIGH LEAN TISSUE HYDRATION: ANALYSIS OF MULTI-COUNTRY DATABASE

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BACKGROUND AND OBJECTIVES

Poor growth early in life (i.e. linear growth restriction, LGR, or stunting) has been associated with an increased risk for several chronic illnesses. LGR is associated with metabolic conditions that may be a result of delayed or poor lean tissue development. The objective of this study was to determine the relationship between LGR and body composition compartments using a global database.

METHODS

Data used for this study were derived from the Doubly Labeled Water Global Database. LGR was assessed using a categorial variable based on the WHO cutoff of stunting (WHZ < -2.00) and height-for-age (HAZ) as a continuous variable. Children with HAZ < -4.00 or < 4.00 were excluded from the analyses. Body composition was determined using the deuterium dilution technique. Differences between groups were analyzed using independent t-tests and linear regression analysis was used to determine the relationship between LGR as a categorical or continuous variable, controlling for body composition.

RESULTS

A total of 2243 children were included in the main analyses with a mean age of 10.9 ± 4.4 years, height of 142.4 ± 24.8cm, weight of 42.0 ± 21kg, and HAZ of 0.20 ± 1.29. For body composition, the mean fat-free mass (FFM) and fat mass (FM) was 30.1 ± 14.8kg and 11.9 ± 9.0kg, respectively, and a mean total body water (TBW) of 1257 ± 607mol. Children with LGR, compared to those with normal height, had no difference in hydration, but significantly lower TBW 901 ± 331 mol v.1272 ± 611mol, FFM 21.6± 8.1kg v. 30.5 ± 15.0kg, and FM 8.6kg 9.5 v. 12.0 ± 8.9kg, respectively. Using linear regression, stunting and HAZ were both significantly associated with higher TBW compared to normal height children (b= 5.40, p=0.002) and (b= 2.52, p=0.005), controlling for FFM and FM.

CONCLUSIONS

The RESULTS of this secondary analysis of body composition in children with and without LGR indicate that growth restriction may inhibit normal lean tissue development. Given that lean tissue hydration decreases with age, it may be that growth deficits inhibit normal lean tissue development resulting in delayed tissue development. Improving the physiological understanding of how LGR influence health and disease later in life remains an important scientific and public health issue. Data for this study can be found at https://doubly-labelled-waterdatabase.iaea.org/home, hosted by the IAEA and generously supported by Taiyo Nippon Sanso and SERCON.

CONFLICTS OF INTERESTS

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OAP 46 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP46_01

HEALTHY AND SUSTAINABLE FOOD EDUCATION IN PRIMARY SCHOOLS: GLOBAL PERSPECTIVES FROM TEACHERS IN AUSTRALIA, SWEDEN AND THE UK

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BACKGROUND AND OBJECTIVES

Healthy and sustainable (HS) food behaviors are crucial for population and planetary health. Primary schools can instil HS food behaviors through education and the food environment, though little is known about actual food practices in primary schools. This study aimed to analyse current practices in HS food education and environments in Australian (AU), Swedish (SW) and UK primary schools and to compare cross-country practices.

METHODS

A cross-sectional survey (2022-2024) collected data about teacher perceptions (importance, self-efficacy) and practices (frequency, training, funding) about HS food education, and school food environments (food gardens, food waste systems, kitchens, lunchtime, policies). Cross-country analyses were conducted using chi-square and ANOVA tests ($p<0.05$).

RESULTS

Participants were 1110 primary school teachers (AU:37%, UK:37%, SW:26%). HS food education was considered equally important to all subjects except English (48%)/Swedish (46%) and Maths (48%). Teachers agreed this should be in the curriculum (89%) and reported high rates of self-efficacy to teach this. Swedish teachers were more likely trained to teach nutrition (SW:44%, UK:33%, AU:30%), to teach HS food education frequently (SW:40%, AU:30%, UK:20%) and to have funding for HS food activities (SW:37%, AU:30%, UK:23%) and training (SW:23%, AU:20%, UK:10%) (all $p<0.001$). Australian schools more likely had food gardens (AU:76%, UK:49%, SW:19%) and food waste systems (AU:56%, SW:29%, UK:25%) for teaching, whilst kitchens were more likely to be available in Swedish schools (SW:67%, AU:59%, UK:28%) (all $p<0.001$). UK schools allowed 33min (SD=14min) for students to eat lunch compared to 27min (SD=8min) and 18min (SD=13min) in Sweden and Australia respectively ($p<0.001$). Swedish schools more likely had policies in place about healthy food services (SW:59%, UK:49%, AU:29%), food sustainability (SW:54%, AU:15%, UK:9%) and food-related curricula (SW:53%, UK:49%, AU:29%) (all $p<0.001$).

CONCLUSIONS

Teachers value HS food education though the degree to which this is taught in primary schools may be impacted by factors such as inadequate training, funding or supportive environments. Differences in HS food education and environments may be explained by geographic and socio-cultural differences. Learnings from the countries analysed, including what supports or hinders HS food education and environments at school, can be used to

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strengthen the position of HS food practices in the primary school sector. This is a critical next step for public health research, policy and practice.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP46_02

IMPACT OF ADDING MILK TO A MICRONUTRIENT FORTIFIED BISCUIT SCHOOL FEEDING PROGRAM: AN EFFECTIVENESS TRIAL IN A PROTRACTED CONFLICT SETTING

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BACKGROUND AND OBJECTIVES

Half a billion children live in conflict-affected zones. Children are particularly vulnerable to conflict-related risks, including direct and indirect effects on mortality, morbidity, and malnutrition. Malnutrition during school-age can adversely affect health and human capital outcomes in the long-term. Little evidence exists on leveraging school feeding programs to improve children's outcomes during conflict. This study assessed the impact of adding milk to a micronutrient fortified high energy biscuits (HEB) school feeding program on children and caregivers' outcomes in Yemen.

METHODS

We conducted a longitudinal cluster-randomized controlled trial where 42 schools in Al Mukha district were randomized to: (1) control (21 schools), where children received daily 2 packets (100 grams) of HEB; or (2) milk (21 schools), where children received daily 2 packets (100 grams) of HEB plus a single use 120 ml carton of ultra-high temperature milk. We assessed impacts on children's (dietary diversity, school attendance, anthropometry, cognition, learning, and behaviour) and caregivers' (food security and mental health) outcomes using linear mixed effects models adjusting for clustering and looked at interactive effects by child age and sex. The trial was registered with ISRCTN (ISRCTN12225603).

RESULTS

The study included 1,285 children (49% girls, 51% boys) aged 9.3 years (SD 1.8) on average. The school milk intervention was delivered at high fidelity throughout the study period. Adding milk to the HEBs reduced the proportion of households experiencing severe or moderate food insecurity by 11 percentage points (pp) and the proportion of caregivers experiencing mental health problems by 3 pp. In children, the addition of milk reduced conduct problems (mean difference (MD) -0.52 (95% CI -0.97, -0.08)) and improved cognition (mean difference (MD) 1.00 (98% CI 0.40, 1.61)), literacy (MD 1.14 (95% CI 0.36, 1.92)), and numeracy (MD 1.06 (95% CI 0.46, 1.67)) scores. Effects were larger among girls than boys. There was no evidence of interaction by child age. We found no impacts on children's dietary diversity, school attendance, or anthropometry.

CONCLUSIONS

Adding a daily milk ration to a fortified HEB school feeding program improved household food security, caregiver mental health, and child behavior, cognition, and learning during conflict. Hybrid models to incrementally improve meal quality are feasible, acceptable, and lead to meaningful impacts. More research is needed on cost effectiveness and long-term benefits.

CONFLICTS OF INTERESTS

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OAP46_03

PATTERNS OF PERINATAL EXPOSURE TO POLYUNSATURATED FATTY ACIDS AND CHILD CARDIOMETABOLIC HEALTH IN A FRENCH MOTHER-CHILD COHORT STUDY

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BACKGROUND AND OBJECTIVES

Perinatal exposure to omega-3 and omega-6 polyunsaturated fatty acids (PUFAs) has been associated with child cardiometabolic health. However, findings from the literature are heterogeneous, potentially due to the variability in the type of biofluid used for PUFAs measurement, and the specific PUFAs examined. Our objectives were to overcome this gap by examining perinatal exposure to PUFAs using patterns derived from three biological biofluids (maternal blood, cord blood, and breast milk), and assess their association with child cardiometabolic health.

METHODS

This study was conducted in 1,140 mother-child pairs from a French cohort. Fatty acid levels in erythrocyte membranes were measured in maternal blood (collected at 24–28 weeks of gestation), cord blood, and colostrum using gas chromatography. Patterns of exposure were derived using principal component analysis of the 34 PUFA species identified in these biofluids. Clinical and biological examination at age 5–6 years provided data on clinical (heart rate, blood pressure), and fasting blood (glucose, insulin, leptin, cholesterol [total, HDL, LDL], triglycerides) parameters. Associations between PUFA exposure patterns and cardiometabolic factors were analysed using partial Pearson's correlations adjusted for confounders. Interactions with child sex were tested, and stratification was performed when significant (p-value<0.05).

RESULTS

Five patterns of perinatal exposure to PUFAs were identified explaining 51% of total variance in PUFA levels. Overall, these patterns were not associated with the child cardiometabolic parameters. However, Pattern 4, characterized by higher levels of linoleic acid (LA) and dihomo-gamma linolenic acid (DGLA) across all three biofluids, was associated with higher insulin resistance indices in girls only (Correlation coefficient r(Insulin) = 0.14, r(HOMA-IR) = 0.14; p-value<0.005).

CONCLUSIONS

Our integrative analysis of patterns of perinatal exposure to PUFAs suggested no overall impact on cardiometabolic health of children aged 5–6 years. The positive association found between the pattern characterised by higher levels of LA and DGLA and insulin resistance in girls only, needs replication in further epidemiological and mechanistic studies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP46_04

ASSOCIATION BETWEEN MATERNAL DIETARY GLYCEMIC INDEX DURING PREGNANCY AND CHILDREN'S NEURODEVELOPMENT: A CHINESE BIRTH COHORT STUDY

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BACKGROUND AND OBJECTIVES

A growing body of evidence suggests a role for dietary glycemic index (GI) during pregnancy in fetal development. However, the long-term impact of maternal GI on infant neurodevelopment remains insufficiently explored. We aim to examine this association among children at 36 months of age in a Chinese birth cohort.

METHODS

Pregnant women (>18 years of age) at 9-11 weeks' gestation were enrolled in the Nutrition in Pregnancy and Growth study while attending routine antenatal visits at a hospital in China. Children were followed up from birth to 36-month year of age. Maternal GI was derived from dietary data obtained from food frequency questionnaires. Children's neurodevelopment at 36-month-old was evaluated using the Bayley Scales of Infant and Toddler Development, third edition (BSID-III). Linear mixed effects regressions models adjusting for potential confounding factors were performed.

RESULTS

1890 women were enrolled between January 5, 2018, and March 31, 2022. Of the 1862 livebirths, 1065 (68%) children were included in the 36-month follow-up. Children of mothers who in the highest tertile of dietary GI during pregnancy had a 21% higher risk of developmental delay than those in the lowest tertile. Specifically, these children showed lower scores on the BSID-III across multiple domains, including receptive and expressive language, cognitive, fine motor, and gross motor.

CONCLUSIONS

The findings suggest that high GI during pregnancy is associated with neurodevelopment delay in children, highlighting the importance of maternal nutrition for long-term child developmental outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP46_05

CONTENT ANALYSIS OF OUT-OF-HOME (OOH) FOOD AND BEVERAGE ADVERTISEMENTS ALONG AN URBAN AVENUE

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BACKGROUND AND OBJECTIVES

Overnutrition is one of the most extensive global public health crises, driven significantly by food marketing. While many efforts have been made to examine and address the effects of food advertisements on the health and nutrition of individuals, out-of-home (OOH) advertising remains understudied, especially in the locale of this study. Thus, this study analyzed OOH food and beverage (F&B) advertising along an urban avenue, focusing on locational aspects, executional elements, extent, and content quality.

METHODS

Conducted in May-June 2024, this cross-sectional study gathered primary data through four on-site observations and photo and video documentation along the 24-kilometer urban avenue that traverses six municipalities and serves as a vital public transportation corridor. The data processing involved encoding advertisements observed along the avenue and classifying them as food or non-food. Then, food advertisements were coded based on size, placement, format, informational cues, and nutritional quality. The study followed and modified the coding from a global network that promotes healthy food environments.

RESULTS

The RESULTS of the study show that the avenue is a prime location for OOH advertising due to its highly urbanized and densely populated surroundings. Local government units along the avenue also face public health concerns because of the high prevalence of overnutrition, which is influenced by the food environment. Of an average of 1,694 advertisements identified, 567 (33%) were promoting food and beverages. Most OOH F&B ads were small (48%) to medium (44%) in size and placed along the roads (65%). The common formats were billboards (49%) and posters/banners (44%). The ads mainly appealed through sensory information (18.8%) and characteristics or images of users (16.57%). More than half of the advertised food products were non-core/unhealthy (63%), while 34% were miscellaneous, and 3% were core/healthy. The frequently promoted non-core products include sugar-sweetened drinks (33%), fast food (32%), and alcoholic beverages (15%).

CONCLUSIONS

The current OOH F&B advertising landscape along the avenue is an obesity-promoting environment. Given that commuters, employees, and pedestrians around the avenue are regular and intent audiences for F&B advertising, OOH advertising along the urban avenue may pose a significant risk to public health, underscoring policies and regulations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP46_06

WOMEN'S EMPOWERMENT AND NUTRITIONAL STATUS OF CHILDREN: NEW EVIDENCE FOR BANGLADESH

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BACKGROUND AND OBJECTIVES

This study examines aspects of women's empowerment related to the nutritional status of the under-five children in Bangladesh, including their age-appropriate diet intake and access to healthcare during acute respiratory tract infection (ARI).

METHODS

Three waves of data from the Bangladesh Demographic Health Survey (2011, 2014, 2017-18) were utilized to construct a survey-based women's empowerment index which consists of three latent variables: 1) social independence, 2) intrinsic agency, and 3) instrumental agency for measuring women's empowerment. Our sample contains married women aged 15-45 years, who were residing with their husbands, and had at least one under-five child. The height-for-age-z (HAZ), weight-for-age-z (WAZ) and weight-for-height-z (WHZ) scores were used to measure the nutritional status of children. A composite variable was created to measure age-appropriate food intake among these children. Descriptive, inferential statistical analyses, as well as generalized structural equation modeling were performed to develop pathways between the different concepts of women empowerment and the nutritional status of children. We analyzed data by using Stata version 17.0.

RESULTS

Women's social independence positively impacted HAZ [coefficient 0.22;95% CI (0.15,0.29)], WAZ [0.17;(0.11,0.23)], and WHZ [0.06;(0.02,0.09)] scores, age-appropriate food consumption [0.03;(0.02,0.04)], and healthcare access [0.03;(0.01,0.06)]. Intrinsic agency was associated with better WAZ score [0.02;(0.009,0.03)] and food consumption [0.74;(0.62,0.86)], while instrumental agency had a negative effect on food consumption [-0.0025;(-0.004, -0.0002)]. An age-appropriate diet significantly improved child nutrition. Seeking treatment from medical professionals at the onset of ARI improved HAZ [0.17;(0.07,0.27)], and WAZ [0.16;(0.08,0.25)] scores.

CONCLUSIONS

Maternal social independence and intrinsic agency enhance the nutritional status, food consumption, and healthcare access of under-five children in Bangladesh. This study highlights the importance of interventions targeting women's empowerment for sustainable improvements in child nutrition and health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP46_07

QUALITATIVE ANALYSIS OF DRIVERS INFLUENCING ADOLESCENTS' FRUIT AND VEGETABLE CHOICES IN SRI LANKA

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BACKGROUND AND OBJECTIVES

Low fruit and vegetable (F&V) consumption among adolescents poses significant health concerns. Understanding the factors influencing these dietary habits is crucial for developing interventions to enhance F&V intake in Sri Lanka. This study aimed to identify individual, social, physical, and macrosystem factors affecting F&V acquisition, preparation, and consumption behavior among Sri Lankan adolescents.

METHODS

Eighteen Focus Group Discussions (FGDs) were conducted with adolescents (both males and females) aged 14-16 years from secondary schools in selected districts reflecting sociodemographic diversity. Data were analyzed using NVivo 12 (QSR International Pty Ltd) software through deductive thematic analysis.

RESULTS

Parental beliefs influence adolescents' F&V choices, including cultural perceptions of F&V as "hot", "cold", "good," or "bad". Key influencing factors were personal preferences, family dynamics, availability, marketing, and media influence. Adolescents prioritize sensory aspects over nutrition in their choices and lacked awareness of F&V intake recommendations. Despite this, they demonstrated a good understanding of health benefits of consuming F&V. Suggestions to increase consumption of F&V included promoting culinary diversity, ensuring affordability and access to quality F&V and managing seasonal availability.

CONCLUSIONS

Adolescents' F&V choices are influenced by cultural beliefs, preferences, family, availability, and media. Addressing sensory priorities, improving access, and promoting diversity can enhance consumption, providing a basis for targeted interventions. Further quantitative and qualitative research across diverse consumer groups is needed to develop impactful strategies to promote F&V intake.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP46_08

JOINT ASSOCIATION OF FOOD INSECURITY AND OVERWEIGHT/OBESITY WITH HYPERTENSION AMONG WOMEN OF REPRODUCTIVE AGE (WRA)

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BACKGROUND AND OBJECTIVES

Food insecurity and obesity could coexist as consequences of economic and social disadvantage, rather than causally related. Among women of reproductive age (WRA), this 'double burden' may contribute to poor mental health, unhealthy lifestyles, and increased risk of hypertension and other chronic diseases. However, the cardiovascular risk implications of this 'double burden' remain understudied. We aimed to examine the joint association of food insecurity and overweight/obesity (OWT/OB) with hypertension among WRA of a middle-income country.

METHODS

Data came from a 2018-2019 cross-sectional national survey, collecting sociodemographic, nutritional and health information on women and households. Our analytic sample included 1538 women aged 15-49 years. Blood pressure was measured and classified as normotension, pre-hypertension and hypertension, according to standard protocols. Food security was assessed via the 8-item Food Insecurity Experience Scale and dichotomized (yes/no). Using measured weight and height, OWT/OB was classified as yes/no. The exposure was a 4-category cross-classification of food insecurity and OWT/OB. Multinomial logistic regression was used, adjusting for confounders.

RESULTS

Mean age was 30 years, with nearly 40% of the sample having elevated blood pressure (28% pre-hypertension/11% hypertension). About 44% experienced the 'double burden' of OWT/OB and food insecurity. Significant positive associations with pre-hypertension and hypertension were found for 'only OWT/OB' and 'double burden'. Women experiencing 'double burden' had 66% (OR=1.66 [1.05-2.62]) and 297% (OR=3.97 [1.53-10.30]) higher odds of pre-hypertension and hypertension, respectively, compared to those experiencing neither OWT/OB nor food insecurity.

CONCLUSIONS

Food insecurity alone may not independently increase hypertension risk, but its interaction with metabolic factors like OWT/OB could exacerbate cardiovascular risk. While OWT/OB alone had a stronger association with hypertension, the increased risk observed in the 'double burden' group, along with the high prevalence of elevated blood pressure in our sample, reinforces the need for targeted preventive health strategies. OWT/OB and its 'double burden' with food insecurity are associated with increased odds of hypertension. Future research should explore longitudinal trends to better understand causal pathways and design effective interventions for middle-income countries.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP46_09

USING AI TO EXTRACT AND ANALYSE INGREDIENT LISTS FROM PACKAGED FOODS AND BEVERAGES ACROSS EUROPE - A CASE STUDY USING FABLE ON THE PRESENCE OF SUGARS AND NON-SUGAR SWEETENING INGREDIENTS IN BREAKFAST CEREALS

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BACKGROUND AND OBJECTIVES

With the goal to support public monitoring of the nutritional quality of the food offer, the JRC developed the web-based tool FABLE (Food Beverages and Labels Explorer) [1]. FABLE aims to not only be a repository of data from labels of food and beverage products, but to also make sense of such data by providing visualisations and other insights of their analysis. The aim of this study was to explore the presence and content of sugars and non-sugar sweeteners (NSS) in breakfast cereals, across different European countries.

METHODS

A new procedure using artificial intelligence (Llama 3.70b instruct model) was developed to allow for the extraction of separate ingredients from ingredient lists of packaged food and beverages. A FABLE reference ingredient list was created for different ingredient classes. Data collected from the Joint Action Best-ReMaP across 19 countries were used to assess the use of specific ingredients in breakfast cereals. The second version of the WHO Europe Nutrient Profile Model was used to assess products' eligibility for marketing to children due to their sugar content.

RESULTS

For the overall breakfast cereals category (n=7451), the majority of the products (>70%) had listed an added or a free sugar as an ingredient; less than 2.5% of the products listed a NSS as an ingredient. Proportion of products having an added or free sugar ingredient varied among sub-categories, from about half of the products (i.e. 'other ready-to-eat cereals') to all products (i.e. all 'chocolate and caramel cereals' and 'filled cereals') having such ingredients.

The average sugar content per 100g of product was 15.9 g, ranging for the different sub-categories from 1.2 g to 28.7g / 100g of product (for 'cereals without added sugar' and 'filled cereals', respectively). Almost two-thirds of the products would not be eligible for marketing to children due to their high sugar content.

CONCLUSIONS

The extraction and analysis of the use of sugars and NSS from ingredient lists of packaged food and beverage products across Europe can give experts and the public better understanding of the food offer quality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

1. [1] https://food-labels-explorer.jrc.ec.europa.eu/en

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OAP 48 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP48_01

SOCIO-DEMOGRAPHIC DETERMINANTS OF DOUBLE BURDEN OF MALNUTRITION IN GUATEMALAN HOUSEHOLDS: EVIDENCE FROM THE EPIDEMIOLOGICAL HEALTH AND NUTRITION SURVEILLANCE SYSTEM (2013-2019)

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BACKGROUND AND OBJECTIVES

Guatemala is a case in point concerning double burden of malnutrition (DBM). To strengthen national programmes in Guatemala targeting DBM, it is important to identify the main drivers of DBM and the degree of overlap with drivers of its disaggregated forms. This study aimed to identify socio-demographic factors uniquely associated with households with DBM, and those shared with households with single forms of malnutrition in Guatemala.

METHODS

This cross-sectional study is a secondary data analysis of the Epidemiological Health and Nutrition Surveillance System 2013-2019. DBM was defined as the co-existence of a woman with overweight and a child with stunting within the same household. Households with single forms of malnutrition were those with a woman with overweight or a child with stunting. The unit of analysis was households with a mother-child pair. Descriptive statistics and multinomial logistic regression were applied.

RESULTS

Based on data from 3,622 households with a woman-child pair collected between 2013 and 2019, we found that one-fifth of households suffered from DBM without a significant change over the period examined. Over the same period, the prevalence of households with a child with stunting decreased from 26% to 23%, and the prevalence of households with a woman with overweight increased from 29% to 31%. Compared to households with neither condition, socio-demographic factors uniquely associated with DBM were middle-income (aOR: 1·81, 95%CI: 1·05-3·12) and women without health insurance (aOR:1·62, 95%CI: 1·00-2·62). Shared factors for households with DBM and households with a woman with overweight were Central region, women aged >25 years and children >18 months. For households with DBM and households with a child with stunting, shared factors were women's primary education and indigenous background. Women reporting no academic education, parity >3 and having children aged 18-36 months, were shared factors for households with DBM and households with single forms of malnutrition.

CONCLUSIONS

These findings represent context-specific opportunities to address various forms of malnutrition in Guatemala simultaneously. Decision-makers should consider these findings when formulating programmes to address malnutrition with a particular focus on health equity among the most vulnerable to DBM.

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CONFLICTS OF INTERESTS

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OAP48_02

ASSOCIATION BETWEEN JAPANESE DIET SCORE AND THE DEVELOPMENT OF CHRONIC KIDNEY DISEASE: THE OHASAMA STUDY

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BACKGROUND AND OBJECTIVES

Preventive interventions focusing on lifestyle, particularly healthy dietary choices, are recommended as an effective approach to control modifiable risk factors for chronic kidney disease (CKD). Although the association between dietary score and CKD has been investigated mainly in Western countries using DASH and Mediterranean diet, few studies have focused on the Japanese diet as food score. The aim of the present study is to examine the association between Japanese diet score (JDS) and the development of CKD.

METHODS

A total of 897 individuals without CKD (68% women; mean age, 59 years old) from Ohasama Town, Japan, were examined. CKD incidence was defined as the presence of proteinuria and/or an estimated glomerular filtration rate (eGFR) of <60 ml/min/1.73 m². The JDS was derived from the components of seven from a priori dietary patterns (beans and bean products, fishes and shellfishes, vegetables, Japanese pickles, fungi, seaweeds and fruits) based on the food frequency questionnaire. The total score ranged from 0 to 7, and participants were divided into quartiles based on scores (0-2, 3, 4-5 and 6-7), with the first quartile (0-2 points) as the REF. Multivariable hazard ratios (HRs) and 95% confidence intervals (CIs) for CKD incidence across each quartile were estimated using a Cox regression model adjusted for potential confounding variables.

RESULTS

During the average follow-up of 9.0 years, 128 CKD incidents were recorded. In women, the HRs (95% CIs) in the JDS score 4-5 and 6-7 groups were 0.40 (0.20–0.80) and 0.31 (0.13–0.71) for CKD incidence and 0.43 (0.20–0.94) and 0.39 (0.16–0.95) for eGFR of <60 ml/min/1.73 m², respectively. These associations were not observed in men.

CONCLUSIONS

Our findings suggest that a higher habitual intake of the Japanese food consisting of food combinations characterized by a Japanese diet may be associated with the reduced risk of CKD incidence in women.

CONFLICTS OF INTERESTS

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OAP48_04

RELATIONSHIP BETWEEN EXCLUSIVE BREASTFEEDING AND INFANT GROWTH: EARLY FINDINGS FROM A POPULATION-BASED COHORT STUDY IN SOUTHEAST ASIA AND SUB-SAHARAN AFRICA USING THE SMALL VULNERABLE NEWBORN FRAMEWORK

Savannah O'malley[1]; Jaime Marquis[1]; Irene Apewe Adjei[2]; Stephaney Gyaase[2]; Ellen Boamah-Kaali[2]; Victor Akelo[3]; Amna Khan[4]; Mutale Sampa[5]; Anne George Cherian[6]; Emily Smith[1]; Kwaku Asante Poku[2]; Prisma Research Working Group: Participating Investigators Of Mnh Study[1]
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BACKGROUND AND OBJECTIVES

No studies have yet examined the relationship between exclusive breastfeeding (EBF) and infant growth using the new “small vulnerable newborns” (SVN) conceptual framework: an umbrella term that includes preterm, small for gestational age (SGA), and low birthweight (LBW) newborns. Investigating this relationship across the various SVN phenotypes could enhance our understanding of their unique challenges, informing targeted interventions. We utilized data from a multi-country open cohort study to investigate the association between EBF and the growth trajectories of infants in the first six months of life.

METHODS

We conducted a secondary analysis of data from the ongoing Pregnancy Risk, Infant Surveillance, and Measurement Alliance (PRISMA) open cohort study in Ghana, India, Kenya, Pakistan, and Zambia. We evaluated the incidence of EBF at six weeks and six months, and conducted descriptive statistics to explore feeding patterns across SVN categories. Additionally, we computed weight-for-age z-scores (WAZ) at the same time points using INTERGROWTH standards and generated plots to compare growth trajectories between preterm and SGA subgroups. Analyses were stratified by birth SVN phenotype.

RESULTS

3,359 infants were included. Maternal-reported EBF prevalence was 95% at six weeks and dropped to 31% at six months. At six weeks, EBF was highest among term AGA infants (96%) and lowest among preterm SGA infants (88%). Of those non-EBF infants, term SGA infants were most likely to receive water (23%) while no preterm SGA infants received water or gruel/porridge. WAZ was higher among EBF infants at 6 weeks compared to non-EBF, particularly among term infants. By 200 days, WAZ trends converged for EBF and non-EBF preterm AGA infants; however, for term SGA and term AGA infants, WAZ remained higher among EBF infants as compared to non-EBF infants of the same phenotype.

CONCLUSIONS

Our findings suggest that the SVN framework is useful for understanding differences in early feeding practices and infant growth. Preterm SGA infants are less likely to be EBF, yet generally are taking only breastmilk and infant formula. While term AGA infants are more likely to be EBF, those not EBF are often exposed to inappropriate early feeding practices. WAZ trends indicate that EBF infants, particularly those who are term SGA or term AGA, tend to have higher growth scores compared to their non-EBF counterparts. These findings highlight a need for more comprehensive and inclusive support to ensure all infants receive appropriate nutrition in the first 6 months of life.

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CONFLICTS OF INTERESTS

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OAP48_05

EFFECTS OF FERRIC CARBOXYMALTOSE ON PICA AMONG PREGNANT ANEMIC WOMEN IN MALAWI

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BACKGROUND AND OBJECTIVES

Pica is the craving and consumption of non-food items, and includes the ingestion of earth (geophagy), raw starch (amylophagy), and ice (pagophagy). The prevalence of pica varies widely, but it is common in Sub-Saharan Africa, especially during pregnancy. Despite being ubiquitous, its etiology is not well understood. We leveraged the randomized trial of intravenous iron for anemia in Malawian pregnant women (REVAMP) to determine the effects of iron therapy in the second trimester, compared to standard-of-care oral iron, on pica behaviors among anemic pregnant women.

METHODS

The REVAMP trial was an open-label, individually randomized controlled trial, conducted in Blantyre and Zomba districts of Malawi. A total of 862 pregnant anemic women in their second trimester were randomized at baseline to receive either 1) a single dose of ferric carboxymaltose (FCM) (Vifor Pharma) at 20 mg/kg up to 1000mg or 2) standard-of-care oral iron (60 mg elemental iron twice daily for 90 days). Engagement in pica was assessed at baseline (i.e., during the second trimester) and 4 weeks thereafter by asking respondents about whether they had craved and consumed any of the following items in the past two weeks: earth (geophagy), unripe mango (amylophagy), raw rice (amylophagy), ice (pagophagy), ash, charcoal, or chalk. Venous blood samples were collected concurrently for hemoglobin and ferritin. A longitudinal Poisson model with a log-link was used to examine the treatment effect of FCM on the outcomes (i.e., any pica and types of pica).

RESULTS

At baseline, the prevalence of any pica was 71.7%, and geophagy was 31.9%. Hemoglobin and ferritin concentrations improved following FCM compared to standard-of-care and were lower among participants with geophagy (but not other types of pica) at baseline and 4 weeks post-randomization. From baseline to 4 weeks post-randomization, the prevalence of geophagy decreased more among women assigned to FCM compared to the standard-of-care (FCM: 33.5% to 12.9% vs standard-of-care: 30.4% to 22.3%, prevalence ratio=0.53 [95% CI 0.39–0.72], p<0.0001). There was no evidence of a treatment effect for overall pica, amylophagy, or pagophagy.

CONCLUSIONS

This study provides causal evidence that geophagy is reduced by improvements in iron status and anemia during pregnancy. Further research on the mechanisms through which iron deficiency drives pica and how different nutritional and behavioral therapies influence pica will further improve understanding of this complex phenomenon.

CONFLICTS OF INTERESTS
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OAP48_06

DIETARY INTAKE TRAJECTORIES FROM CHILDHOOD AND SUBSEQUENT HEALTH OUTCOMES: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

The vital role of early dietary intake in shaping later health has been widely acknowledged, but how changes in dietary intake from early life influence subsequent health outcomes remains unclear. This systematic review aimed to synthesize the literature that examined the associations between changes in dietary intake (i.e., trajectories) from childhood and subsequent health outcomes later in life.

METHODS

Electronic searches were conducted in PubMed, Embase, and ScienceDirect to gather literature from inception to May 2024. Longitudinal cohort studies investigating dietary intake trajectories from childhood and subsequent health outcomes were included. Reporting of the review followed PRISMA guidelines and study quality was assessed using the SIGN 50 checklist.

RESULTS

Fifteen studies were included. Of which, 13 reported significant associations between dietary intake trajectories (diet quality, dietary pattern or intake of specific nutrients) in childhood (n=9) or from childhood to adolescence(n=6) and subsequent dental, cardiometabolic, neurocognitive, liver or gut health outcomes from age 2 years up to age 31 years. A healthy dietary pattern trajectory during infancy was associated with a lower risk of dental caries, while a high or increasing sugar intake trajectory was linked to a higher risk of dental caries in early childhood. A poor diet quality or high discretionary food or red meat intake dietary pattern trajectory from childhood to adolescence was associated with increased obesity and cardiometabolic risks at adolescence and early adulthood. Moreover, a healthy dietary pattern trajectory was also linked to better neurocognitive development in childhood. Significant positive associations were also found between macronutrient intake trajectories (e.g., protein, carbohydrates, fibre) during infancy and better language and motor skills in early childhood. There was also evidence to support associations between high energy intake trajectory from early childhood to adolescence and poor liver health outcomes in adulthood, as was for carbohydrate intake from infancy to early adulthood and gut microbiota composition in early adulthood. No evidence of association was found between breakfast diet quality or fibre intake trajectory and obesity outcomes in early childhood.

CONCLUSIONS

Dietary intake trajectories from childhood have been associated with various health outcomes from early childhood to adulthood. Early dietary interventions from childhood are crucial for promoting lifelong health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP48_08

A mixed-METHODS assessment of the mother-child interaction during the STIMNUT intervention (psychosocial stimulation of severely malnourished children) in Koutiala, Mali

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BACKGROUND AND OBJECTIVES

In Mali, the prevalence of global acute malnutrition reached 11.5% in 2022, while severe acute malnutrition (SAM) was 2.1%, placing the country in a concerning situation overall (1). Mother-child interaction is often at risk when the mother or the child are severely malnourished. MSF implemented a brief psychosocial stimulation intervention targeting 36 children between 6–23-months of age with SAM in Koutiala, Mali, and their primary caregivers to enhance mother-child interaction, and support recovery from SAM.

METHODS

To assess mother-chid interaction, we conducted a mixed-METHODS study. We used an adapted version of the Parenting Interactions with Children: Checklist of Observations Linked to Outcomes (PICCOLO) tool pre- and post-intervention (2). Also, we administered 'Dusukasi' scale to assess a local perinatal depression-like syndrome for mothers, and we monitored the child's weight. For the quantitative part, we calculated Cohen's d effect sizes to assess changes (pre vs. post intervention) and used a bootstrap resampling approach (10,000 iterations) to estimate 95% confidence intervals, using quantitative data from the observations and caregivers' questionnaire. For the qualitative part, we analysed field notes and debrief sessions with the local study team, and in-depth interviews with caregivers.

RESULTS

PICCOLO scores indicated a large effect size (Cohen's d = 0.97, 95%CI: 0.55, 1.40), suggesting substantial improvement in mother-child interactions. Also, maternal perinatal depression decreased (Dusukasi tool Cohen's d = -0.69, 95%CI: -1.19, -0.22), and child's weight increased significantly (Cohen's d=1.61, 95%CI; 1.28, 2.12), with a mean gain of 880g post-intervention. Qualitative findings suggested stronger emotional bonds and interactions between mothers and children in all PICCOLO domains (affection, responsiveness, encouragement, teaching) at post-intervention. Participants noted an increased in self-confidence and autonomy towards the child, and decreased of sadness, and depressive emotions in themselves.

CONCLUSIONS

Integrating psychosocial stimulation into SAM treatment programs improved mother-child relationships, maternal mental health and supported the child's recovery. The PICCOLO tool was found contextually-appropriate to assess mother-child interaction in Koutiala. Although a validation of the tool is required, PICCOLO has the potential to facilitate the assessment of complex interactions among mothers and children, including when children suffer from SAM.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP48_09

A GIS-BASED MAPPING OF HEALTHY AND UNHEALTHY FOOD ACCESSIBILITY IN SRI LANKAN SCHOOL FOOD ENVIRONMENT

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BACKGROUND AND OBJECTIVES

The formative years of students are crucial for their growth and development, with schools playing an important role in meeting a significant portion of their daily nutritional needs. As a result, the school food environment greatly influences students' dietary habits, shaping their overall health and well-being. This study aimed to apply Geographic Information System (GIS) techniques to evaluate the availability, accessibility, and distribution of healthy and unhealthy food options both within school premises and surrounding areas.

METHODS

This study was carried out in the Negombo education zone in Western Province, Sri Lanka encompassing 30 purposively selected schools across three educational divisions. Food availability and accessibility within a 500-meter radius of each school were mapped and analyzed using ArcGIS software.

RESULTS

Among the 30 schools surveyed, 25 had operational canteens, and 14 maintained aesthetically pleasing and well-maintained school gardens. Within the 500-meter radius of schools, 476 food outlets were identified, including grocery stores, pastry shops, and mobile vendors. These outlets predominantly sold unhealthy food options such as highly refined starch-based foods, sugary beverages, fried snacks, and ultra-processed products, with limited availability of healthier alternatives. While the availability of unhealthy food options within schools was comparatively lower, the widespread accessibility of such options in the surrounding environment raised significant concerns.

CONCLUSIONS

This study demonstrated the value of spatial analysis in understanding the food environment's influence on students' dietary behaviors. The findings reveal a pressing need for targeted interventions to enhance the availability and accessibility of healthy food options while reducing the availability of unhealthy choices around schools. Collaborative efforts between schools, local communities, authorities and policymakers are crucial to fostering a healthier school food environment and promoting the overall well-being of students.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 52 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP52_01

ASSOCIATION OF DIETARY CHOLINE AND BETAINE INTAKE WITH ALL-CAUSE MORTALITY: A LONGITUDINAL STUDY FROM THE CHINA HEALTH AND NUTRITION SURVEY

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BACKGROUND AND OBJECTIVES

Epidemiologic evidence on the association between choline-related nutrients and mortality risk remains limited, particularly among non-Western populations. We examined the association of dietary choline and betaine intake with all-cause mortality in Chinese adults.

METHODS
We included 9,027 men and 8,828 women from the China Health and Nutrition Survey 1991-2015 who were free from cardiovascular disease and cancer at baseline. Choline and betaine intake were repeatedly assessed using 3-day 24-hour dietary recalls at the individual level combined with weighing METHODS at the household level. Death was ascertained through household surveys in each wave. Participants were classified into five groups according to sex-specific quintiles of cumulative average dietary intake of choline and betaine. We used time-dependent Cox proportional hazards regression models to estimate multivariable-adjusted hazard ratios and 95% confidence intervals with the first quintile as the reference. We also conducted restricted cubic spline regression analyses to assess nonlinear associations between choline or betaine intake and mortality risk.
RESULTS

During a median follow-up of 9.1 years, 891 men and 687 women deceased. Higher dietary intake of total choline was associated with a lower risk of all-cause mortality in both men [HRQ5 vs. Q1 = 0.58 (95% CI: 0.45, 0.74)] and women [HRQ5 vs. Q1 = 0.59 (95% CI: 0.44, 0.78)]. The dose-response curve followed a reverse J-shape in men and an L-shape in women (both *P*-nonlinear ≤ 0.005). Similarly, dietary intake of fat-soluble choline was inversely associated with the risk of all-cause mortality in both men [HRQ5 vs. Q1 = 0.59 (95% CI: 0.46, 0.75)] and women [HRQ5 vs. Q1 = 0.53 (95% CI: 0.40, 0.70)], showing reverse J-shaped patterns (both *P*-nonlinear < 0.001). A J-shaped association between dietary water-soluble choline intake and all-cause mortality was observed in women (*P*-nonlinear < 0.001), but a null association was found in men. Betaine intake was not associated with all-cause mortality in either sex.

CONCLUSIONS

Our findings suggest that adequate intake of choline, but not betaine, may reduce the risk of death among Chinese adults, while excessive intake of water-soluble choline might promote death in women.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP52_02

ASSESSING THE HEALTHINESS OF ADOLESCENTS' FOOD ENVIRONMENTS USING WEARABLE CAMERAS AND DEEP-LEARNING MODELS

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BACKGROUND AND OBJECTIVES

Dietary habits of young adolescents are shaped by complex exposures within their home, school, and neighborhood environments. The assessment of food environment exposures is limited by self-reports and the need for nutritional expertise. Wearable cameras, combined with machine learning could provide more objective and representative data. We aimed to develop a deep learning approach to assess the healthiness of young adolescents' food exposures captured through images from wearable cameras.

METHODS

As part of a cross-sectional study of a representative sample of school-children conducted in Lebanon (January to May 2022), a culturally acceptable wearable camera and machine-learning-based data collection system was developed through a user-centered design approach. Various technological safeguards were integrated to minimize risks. A sub-sample of 190 students (mean age 12.0±0.8 years), wore a camera fastened over their clothes, for one day, outside of school. Machine learning models were customized to detect and retain a sub-set of face-blurred images solely related to food, and categorized into food consumption, food advertisements, and food outlets. For food consumption images, an end-to-end deep learning approach using a tailored object detection model identified food items within each image. To evaluate the healthiness of food exposures, a machine learning model classified food items into the 29 food groups of the Diet Quality Questionnaire (DQQ). The model is trained on a custom dataset created by the study team, with images manually labeled by expert nutritionists using the Labelbox crowdsourcing platform.

RESULTS

The food detection model had a test precision of 95%, a test recall of 89%, and a test F1-score of 92%, while the food-consumption model had a test precision of 93%, a test recall of 98% and a test F1-score of 95%. Analysis of the DQQ classifier model's performance is currently underway, with RESULTS available to be presented at the conference.

CONCLUSIONS

Healthiness of adolescent food exposures can be determined through the generation of several diet quality indicators, including the Global Dietary Recommendations (GDR) score, reflecting dietary risk- and protective-factors for NCDs. Applying the DQQ classifier model beyond images of food consumption to images from other food exposures can offer a valuable tool to assess the quality of food in adolescent's environments.

CONFLICTS OF INTERESTS

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OAP52_03

FORTIFIED PORRIDGES OR NUTRITIONALLY IMPROVED TRADITIONAL RECIPES INCREASED ENERGY INTAKE DURING A MEAL IN INFANTS AGED 6-8 MONTHS IN THE RURAL REGION OF DOGO, NIGER

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BACKGROUND AND OBJECTIVES

With 17.6% of children aged 6-23 months suffering from global acute malnutrition and 43.1% from stunting in Niger in 2022, effective strategies are needed to improve children's energy and nutritional intake from complementary foods. We compared the intakes of different food solutions: fortified infant flour (FIF) or nutritionally improved traditional recipes (NITR) versus traditional food.

METHODS

Infants from 40 rural villages in the commune of Dogo, Niger, aged 6-8 months, were recruited in a cluster-randomized controlled trial with four arms. All groups received a Water, Sanitation and Hygiene (WASH) package. The three groups other than the control (C group) benefited of Responsive Feeding (RF) awareness raising activities, either alone (RF group), or with the distribution of fortified infant flour for the preparation of two porridge meals per day (FIF group), or with training in the preparation of nutritionally improved traditional recipes, including the distribution of the necessary key ingredients, available locally (NITR group). We measured food intake twice for each child by weighing the bowl/plate before and after consumption. Associations were tested using linear mixed models with intakes as the response variable, groups as predictor, age, gender, and socioeconomic terciles as covariates, and village as a random effect.

RESULTS

Meal observations and intake measurements were completed for 244 children. The FIF group had the lowest average food intake during meal observation (44.9 ± 28.9 g /meal), lower than the NITR group (58.0 ± 39.1 g /meal) which had higher food intake than the control (48.0 ± 34.4 g /meal) and RF (49.8 ± 28.9 g /meal) groups. However, after conversion to energy, average energy intake differed significantly between groups ($p < 0,001$), with FIF (41.8kcal/meal) was higher than that of NITR (36.1kcal/meal), itself much higher than those of control (18.8kcal/meal) and RF groups (18.3kcal/meal). RF alone, with low energy dense traditional foods, did not significantly increase energy intake. However, the contribution to energy requirements from complementary foods remained low for two meals in the FIF (41.8± 26.9%) and NITR (36.1 ± 25.4%) groups. Even if energy intake was almost doubled with the food solutions, a high meal frequency (at least 4 meals/day must be maintained to ensure the full satisfaction of energy requirements.

CONCLUSIONS

NITR showed a high performance in both food and energy intake, emphasizing their potential as a sustainable and context-adapted solution to improve children's nutrition.

CONFLICTS OF INTERESTS
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OAP52_04

MEAL TIMING AND RISK OF DEPRESSIVE SYMPTOMATOLOGY IN A FRENCH COHORT

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BACKGROUND AND OBJECTIVES

Circadian misalignment is a hallmark of depression, but whether circadian disruption linked to meal timing can affect the occurrence of depression has not been studied. The objective was to investigate associations between meal timing and risk of depressive symptomatology.

METHODS

We included 51726 participants (77% women, mean age 44.9±14.7) from the French NutriNet-Santé cohort (2009-2022), with no prevalent depression or antidepressant use at inclusion or during the first two years of follow-up. Dietary intake was assessed by averaging data from repeated sets of three non-consecutive 24-hour records, administered at inclusion and every six months over two years. Meal timing indicators included: time of first and last food intake, nighttime fasting duration, eating jetlag (difference in eating midpoint between working and non-working days), and the percentage of energy intake after 5 p.m. Depressive symptoms were assessed using the CES-D scale every 2 years, and cases were defined according to French thresholds. Multivariable Cox models, adjusted for sociodemographic, lifestyle factors and dietary patterns were used.

RESULTS

During a median follow-up of 8.5y, 9839 incident cases of depressive symptomatology were identified. Compared to those with a first food intake between 7:30-8:30 a.m., participants eating earlier (HR=1.09, 95%CI 1.03–1.14) or later (HR=1.14, 95%CI 1.08–1.20) than this range had higher risk of depressive symptomatology. Having a last food intake after 9 p.m. compared to between 8–9 p.m. was associated with higher risk (HR=1.07, 95%CI 1.01–1.13). Consuming over 60% of daily energy intake after 5 p.m. was linked to a higher risk (HR=1.40, 95%CI 1.23–1.59) compared to consuming ≤35%. A shorter nighttime fasting (≤11 hours) was associated with a higher risk (HR=1.08, 95% CI 1.01-1.15) compared to those with night fasting between 11-12h, only among those with a first meal ≤ 8 a.m. Compared to an eating jetlag intensity ≤ 1h, those with 1-2h had higher risk (HR=1.06, 95%CI 1.01–1.11).

CONCLUSIONS

This study suggests that altered meal timing patterns may increase the risk of depressive symptoms. These findings, if replicated in other cohorts, unravel a potential role of meal timing as a prevention strategy for mental health.

CONFLICTS OF INTERESTS
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OAP52_05

CONSUMPTION OF FORTIFIED COMPLEMENTARY FOOD, BUT NOT PROMOTION OF RESPONSIVE FEEDING, IMPROVED HEMOGLOBIN AND MICRONUTRIENT STATUS OF YOUNG CHILDREN IN A CONTROLLED, CLUSTER RANDOMIZED TRIAL IN MADAGASCAR

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BACKGROUND AND OBJECTIVES

Globally, micronutrient deficiencies are a serious public health problem in early childhood with >50% of children affected. We aimed to evaluate effects of Responsive Feeding (**RF**) and the consumption of Fortified Complementary Foods (**FCF**), either alone or combined, on hemoglobin concentrations and micronutrient status of young children in a rural area of Madagascar.

METHODS

Infants (n=706), age 6-7 months, were recruited in a 2x2 factorial randomized controlled intervention trial. The control group only received counselling on water, sanitation and hygiene practices (**WASH**), while the 3 interventions groups received in addition to WASH, promotion of Responsive Feeding (**RF**), provision of daily fortified complementary food (**FCF**) or both (**FCF+RF**). Hemoglobin concentrations and micronutrient status (iron, zinc, vitamin A and thiamine) were evaluated at baseline and at the end of the intervention after 9 months. Impact of interventions was evaluated with generalized mixed models.

RESULTS

Prevalence of micronutrient deficiency was high with 85% of children affected by 1 or more deficiencies. Consumption of FCF increased concentrations of hemoglobin (+5.4 g/L, 95% CI: +2.5, +8.4) and retinol-binding-protein (RBP +0.09 mmol/L, CI 95%: +0.04, +0.14), and decreased prevalence of zinc and thiamine deficiency over the intervention period. Promotion of RF had only a positive effect on RBP concentrations (+0.06 µmol/L, CI 95%: +0.01, +0.11), but surprisingly a negative impact on iron, zinc and thiamine status. There were significant interactions between RF and FCF for most biomarkers of micronutrient status.

CONCLUSIONS

This study confirms the urgent public health problem of micronutrient deficiency in young children in Madagascar, and the potential of FCF to improve micronutrient status. Surprisingly, RF tended to have a negative impact, warranting more research into appropriate RF training modules.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP52_06

THE EFFECT OF YELLOW MEALWORM-ENRICHED MAIZE PORRIDGE ON GROWTH AND MICRONUTRIENT STATUS OF SCHOOL-GOING CHILDREN

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BACKGROUND AND OBJECTIVES

More than 1.7 million refugees in Uganda are vulnerable to food insecurity, which increases the risk of malnutrition among children. Diets within the region are dominated by cereals and high starch vegetables with minimal intake of animal-sourced foods (ASF). Increased consumption of ASF can improve growth, nutrition and health of children. Farming edible insects provides a novel option for locally produced sustainable and nutrient-dense ASF. The nutrition and health impacts of consuming edible insects is however not well established. This study investigated the effects of a yellow mealworm-enriched porridge on the nutrition and health status of 6-9-year-old school children living in and around Kyaka II refugee settlement in western Uganda.

METHODS

The study utilized a randomized two-arm parallel design. School children aged 6-9 years were individually randomized to either an intervention group receiving an insect-enriched maize porridge with 25% inclusion of yellow mealworm or a control group receiving a standard plain maize porridge. The porridge was served daily in 2 schools (within the host community and refugee settlement) for a duration of 15 weeks. Biological samples (stool, blood, saliva) were collected at baseline and endline, along with anthropometric measurements and dietary data, which were also obtained at intermediate time points.

RESULTS

We formulated a school meal product with mealworm that was accepted by the participants. The school intervention including 342 children was completed in October 2024. Data analysis of primary outcome of height gain is ongoing, scheduled to be finalized in Q2-2025. The primary outcome will apply linear mixed-effect model for the intervention effect. Multiple outcomes from the study will include additional anthropometric measures, micronutrient biomarkers, hemoglobin, gut health markers, and body composition.

CONCLUSIONS

The RESULTS of the study will contribute to the understanding of the nutritional and health effects of edible insects as a novel, sustainable alternative animal-food protein source, with the potential to improve nutrition and health in school children in food- insecure environments.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP52_07

EVALUATING FRONT-OF-PACK-NUTRITION-LABEL (FOPNL) FORMATS AMONG CONSUMERS ACROSS ECONOMIC STRATA FOR INFORMING REGULATION IN INDIA – A COUNTRYWIDE CROSS-SECTIONAL QUASI EXPERIMENTAL STUDY

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BACKGROUND AND OBJECTIVES

In the context of rising overweight/obesity and non-communicable diseases, front-of-pack-nutrition labels (FoPNL) can promote informed and healthy food choices. In India, FoPNL regulation still remains a challenge, with two draft regulations introduced by the Food Safety Standards Authority of India (FSSAI) in 2015 and 2022 (color-coded warnings and star-rating respectively) not meeting wider acceptability. Given the country's diversity, context-specific evidence on the effectiveness of FoPNLs is crucial for informing the ongoing regulatory process. This study aimed to assess consumer acceptability, likeability, and understanding of five FoPNL formats—Nutri-Score (NS), HealthStarRating (HSR), Warning Labels (WL), Multiple Traffic Lights (MTL), and Nutri-Star Rating (NSR)—and compare attributes like noticeability, cognitive workload, and purchase intention.

METHODS

This was a pan-India cross-sectional study with a quasi-experimental design conducted among 3,231 participants (2,616 adults and 615 adolescents) from urban, rural, and slum populations across five regions of India. Participants completed a pre-tested, three-part questionnaire in a single contact session- Part-1 collected socio-demographic data and food label reading habits; Part-2 evaluated likeability and cognitive workload across five FoPNL formats. In Part-3, participants were randomized to each of the five formats and were shown mock-up food packs to assess noticeability, understanding, health perceptions, and purchase intentions.

RESULTS

Over 75% reported reading labels, but mostly focused on ‘manufacturing’ or 'use-by' date. Only 39% read nutrition information, only 10% read regularly. Among FoPNL formats, NS was most preferred, followed by NSR. WL were least favoured. 95% stated that summary indicator formats made identifying healthy foods easier, with 92% finding NS useful. For identifying unhealthy variants, NS (60.6%) and NSR (67.4%) were preferred. NS, NSR, and HSR were easier to understand than WL and MTL. All FoPNL formats helped identify ‘healthiest’ or ‘least healthy’ variants. Summary indicators created ‘halo effect’, making even less healthy foods appear healthy. WL deterred choosing even moderately healthy variants .

CONCLUSIONS

Summary indicators (NS, HSR) effectively promote healthier food choices, while warning labels (NSR, WL) better deter unhealthy food choices. For choosing the right format for India, FSSAI should define the purpose - to encourage choice of healthier options or to deter choice of foods high in nutrients of concern.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP52_08

DIGITAL MARKETING TACTICS IN THE COMMERCIAL MILK FORMULA INDUSTRY IN CENTRAL AMERICA AND THE CARIBBEAN

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BACKGROUND AND OBJECTIVES

Digital marketing has become the predominant marketing channel in many regions, with some countries reporting that over 80% of exposure to commercial milk formula advertisements occurs online. This study aimed to characterize the digital marketing landscape and identify the most prevalent tactics used by the commercial milk formula industry in Guatemala, Panama, and the Dominican Republic**.**

METHODS

We applied the CLICK monitoring framework developed by the World Health Organization to evaluate digital marketing practices in the commercial milk formula industry. Two steps of the framework were used: 1) Comprehending the digital ecosystem and 2) analyzing the landscape of campaigns. First, we identified the top milk formula products and the main digital platforms utilized in Central America and the Caribbean. Then, we manually scanned the websites and social media feeds of these brands to document the most frequently used marketing tactics and quantify violations of the International Code of Marketing of Breastmilk Substitutes and regional legislations from November 2023 to May 2024.

RESULTS

The most commercialized products included growing-up milk (94%), infant formula (4%), and follow-up formula (2%). Key marketing strategies employed by the industry included the use of messages that manipulate and exploit parents' emotions and anxieties (58%), the use of nutritional and health claims (49%), and click-to-chat marketing (e.g., invitations to virtual support groups) (38%). We identified 358 online advertisements that violated the Code and regional laws, accounting for 2,757 specific breaches across multiple legal provisions. Additionally, we observed a cross-border marketing strategy, with campaigns targeting pregnant women and mothers across the region.

CONCLUSIONS

Our findings underscore the urgent need to strengthen legislation protecting and promoting breastfeeding in Central America and the Caribbean. Enhanced enforcement and regulatory mechanisms are essential to curb exposure to the aggressive digital marketing tactics employed by the commercial milk formula industry.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP52_09

A FLAVONOID-RICH DIET IS ASSOCIATED WITH IMPROVED BIOLOGICAL AGEING

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BACKGROUND AND OBJECTIVES

Flavonoids have been shown to reduce systemic inflammation and oxidative stress suggesting potential to delay the aging process. We conducted a population-based study in the UK Biobank to investigate the relationship between (1) flavodiet score and (2) intakes of flavonoid subclasses and attenuation of biological ageing.

METHODS

Flavodiet score adherence and intake of flavonoid subclasses were derived from 24-hour computerised dietary assessments. Diet quality was assessed using the alternative Healthy Eating Index (aHEI). Biological aging was quantified using the Klemera-Doubal method, which includes biomarkers of cardiometabolic, inflammatory, liver and kidney function, and can be interpreted as years of biological age [1]. Multivariable regression models adjusted for a wide range of potential confounders were used to assess associations between flavonoid intakes and biological aging.

RESULTS

In 119,393 participants (52% female, median [IQR] age, 58.7 [51.0-64.0] years) when comparing the highest with lowest quintile of flavodiet score, consuming 6 additional servings per day of flavonoid-rich foods was associated with better biological aging [βQ5-Q1 (95% CI): -0.5 y (-0.6, -0.4)]. Of the flavonoid subclasses, higher intake of flavanones [-0.4 y (-0.5, -0.4)], anthocyanins [-0.5 y (-0.6, -0.4)], flavones [-0.6 y (-0.7, -0.5)] and proanthocyanidins [-0.6 y (-0.7, -0.5)] were also associated with better biological aging. There were indications of interactions with diet quality as associations between intake of the anthocyanin subclass and biological aging were greatest in those with the poorest diet quality, as assessed using the aHEI.

CONCLUSIONS

A diet rich in commonly consumed flavonoid-rich foods such as apples, tea, and berries, was

associated with better biological ageing, particularly in those with the poorest quality diets.

CONFLICTS OF INTERESTS

A Cassidy acts as an advisor to the US Highbush Blueberry Council (USHBC) grant committee and has received funding from them for a randomized control trial and population-based work.

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OAP 53 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP53_01

UNDERSTANDING DECENTRALISED SCHOOL FOOD PROCUREMENT IN GHANA: USING PHOTOVOICE TO WALK IN SCHOOL CATERERS' SHOES

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BACKGROUND AND OBJECTIVES

The Ghana School Feeding Programme (GSFP) uses a decentralised procurement model, placing school caterers at the core of the programme with responsibilities to: select, purchase, transport, prepare and distribute meals. However, caterers' perspectives are not always given importance during programme implementation, monitoring and evaluation. This study aimed to better understand the lived experiences of GSFP caterers to identify context-specific challenges and solutions to programme delivery.

METHODS

A Photovoice study was conducted in March-April 2024 in three socio-economically diverse districts in the Greater Accraregion: La Nkwantanang Municipal, Ashaiman Municipal, Ningo-Prampram District. School caterers (n=30) were randomly selected and invited to attend a training on photography skills, safety ethics and to co-create two research questions. In a second phase, participants took thematic photographs, which were then used to guide discussion during individual follow-up interviews (n=19). Data analysis used a priori and emergent themes, based on a 9-step school food system framework. Finally, a photo exhibition was held to advocate for change within the GSFP.

RESULTS

While challenges and solutions were discussed in each school food system step, infrastructure support (n=19), food preparation (n=19), caterer wellbeing (n=19) and wholesale and trading (n=18), were cited as key challenges. Delayed GSFP payments to caterers cut across these themes. Delays interrupted caterers' ability to purchase food and equipment (e.g. fuel, utensils), resulting in changed school menus (e.g. switched ingredients for more affordable foods or food served in smaller quantities). Caterers also described putting other food systems actors, like vendors, at risk by taking loans that could not be reimbursed, which created stress and negatively impacted their wellbeing. Caterers' proposed solutions included: on-time GSFP payments, buying food items in bulk to reduce price per unit/kilo, gaining access to electricity for safe food storage (e.g. refrigeration) and building functional kitchens on school premises to reduce delays in meal service and associated costs of transporting meals cooked offsite.

CONCLUSIONS

This study provides insights into the everyday challenges and successes of GSFP caterers. Increased programme support, timely payments and improved caterer wellbeing are needed to ensure programme continuity and widespread provision of nutritious school meals in Ghana.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP53_04

MISSION VS MARGINS: A SCOPING REVIEW OF SOCIAL ENTERPRISE BUSINESS MODELS AS A SOLUTION TO SUSTAINING HEALTH-PROMOTING FOOD AND NUTRITION-BASED INTERVENTIONS

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BACKGROUND AND OBJECTIVES

Most food and nutrition initiatives are abandoned within two years due to a lack of secure long-term funding. This review explored the business models of food or nutrition-based social enterprises whose mission improved the health or nutrition of communities.

METHODS

For this scoping review, eight databases were searched in July 2024, with 2502 articles retrieved. After applying inclusion and exclusion criteria, 28 studies (20 case studies, 6 evaluations, 1 cross-sectional and 1 quasi-experimental study) were included in a narrative synthesis. The operational status of each social enterprise was cross-checked via Google in October 2024.

RESULTS

Eight business models operating in 13 countries were identified. The business models included social cooperative; employment; targeted customer service; beneficiary service; market intermediary; social partnership; trading business; and social business. The targeted customer service model was the most widely applied. On average, these social enterprises had been in operation for 16.5 years, highlighting that such models that continually deliver on social impact can have longevity.

CONCLUSIONS

Social enterprises that adopt sustainable operational income generating models from their outset, can become self-sustaining, whilst improving food and nutrition-based outcomes for communities. There are various operational models, however different, have proven longevity. These models allow profit and social purpose to co-exist and benefit the communities they serve.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP53_05

THE INTAKE, SUPPLEMENTATION AND BLOOD CONCENTRATIONS OF CAROTENOIDS IN THE PREVENTION OF CARDIOVASCULAR DISEASES: INSIGHTS FROM AN UMBRELLA META-ANALYSIS

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BACKGROUND AND OBJECTIVES

Cardiovascular diseases (CVD) pose a major threat to public health worldwide, while carotenoids are considered beneficial for preventing CVD. There is a need for a systematic and comprehensive study to provide a clearer understanding of the relationship between carotenoids and CVD risk. The aim of the present study was to further conduct an umbrella review to explore the latest evidence of the influence of carotenoids on CVD.

METHODS

The literature published before September 2024 in PubMed, Web of Science, Embase, Cochrane Library and other databases on the effect of carotenoids on CVD was searched. Manual screening, quality assessment, and data extraction of search RESULTS were conducted strictly according to the inclusion and exclusion criteria. Comprehensive Meta Analysis version 3.3 software was used to perform the umbrella meta-analysis.

RESULTS

The odds ratio (OR) between carotenoids and total CVD risk was 0.924 (95% corresponding intervals (CI): 0.878–0.972; $p < 0.001$), indicating a significant negative correlation. Furthermore, our analysis revealed that the protective effect of carotenoids on CVD was significant in coronary heart disease (OR: 0.875; 95% CI: 0.822–0.932; $p < 0.001$), stroke (OR: 0.815; 95% CI: 0.734–0.906; $p < 0.001$), and myocardial infarction and ischemic heart disease (OR: 0.866; 95% CI: 0.727–1.031; $p = 0.105$). However, subgroup analysis of source of carotenoids on various CVD revealed that the carotenoids supplementation significantly increased in the risk of total CVD (OR: 1.061; 95% CI: 1.037–1.086), coronary heart disease (OR: 1.018; 95% CI: 0.982–1.057), stroke (OR: 1.090; 95% CI: 1.010–1.117), and myocardial infarction/ ischemic heart disease (OR: 1.023; 95% CI: 0.949–1.103).

CONCLUSIONS

Our study has investigated the most comprehensive evaluation of the relationship between carotenoids and CVD risk and found that multiple carotenoids were significantly associated with minimizing the risk of CVD.

CONFLICTS OF INTERESTS

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OAP53_06

USING NUTRITION EDUCATION AND SCHOOL GARDEN TO IMPROVE THE DIETS OF CHILDREN AND ADOLESCENTS IN URBAN AND PERI-URBAN AREAS OF SOUTHERN BENIN

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BACKGROUND AND OBJECTIVES

School feeding helps advance children's health and nutrition. This study evaluated the effect of a food and nutrition education (NE) program including school gardens (SG) on schoolchildren knowledge, attitude and practices (KAP) in southern Benin. This investigation supports the National Integrated School Feeding programme implemented since 2017.

METHODS

A cluster randomized trial was implemented with a group of elementary schools as intervention group and another group as control group. After a diagnostic evaluation of the food environment of elementary schools with canteens, a participatory approach was used to design an inclusive intervention combining NE sessions and SG. Innovative tools such as posters and videos were developed and used during weekly NE sessions targeting all school actors: schoolchildren, cooks, food vendors, parents and teachers. NE sessions developped mainly dietary diversity corresponding to the main gap identified during the diagnostic. SG contributed to fruit and vegetable production and school canteens supply as well as learning platforms for schoolchildren. The intervention lasted 1.5 academic year. We evaluated KAP on dietary recommendation among 800 schoolchildren. As practices, we targeted consumption of fruits and vegetables, Dietary diversity and Dietary Species Richness.

RESULTS

After 1.5years of implementation, we observed a significant increased of the overall knowledge of the schoolchildren among definition and roles of food groups as well as attitude among diversified diet in the intervention group compared to the control group. As for practices, 75-86% of schoolchildren from the intervention group reported having a diversified diet after the intervention compared to only 50% in the control group. Percentages of schoolchildren who achieved the minimum dietary diversity had decreased from baseline to endline in the control group ($p=0.011$) whereas remained constant in the intervention group similarly for dietary species richness. In terms of food groups, fruits remained globally less consumed by schoolchildren. However, percentages of chlidren having consumed and the diversity of fruits consumed had significantly increased in the different intervention schools.

CONCLUSIONS

The NE-SG program facilitated gaining of knowledge and positive attitudes as well as improving of practices such as consumption of fruits and diversified/balanced diet. Increasing the duration of the intervention and intensifying the NE are essential to ensuring the sustainability of the changes initiated by this pilot.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP53_07

DIETARY INDEX FOR GUT MICROBIOTA, PHYSICAL ACTIVITY IN RELATION TO MORTALITY

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BACKGROUND AND OBJECTIVES

The gut microbiota is crucial in immune function, metabolism, and neurobehavioral processes. The Dietary Index for Gut Microbiota (DI-GM) has been developed to capture a dietary pattern that reflects the diversity of gut microbiota. However, the relationship between DI-GM and mortality risk and the potential role of physical activity in modifying this relationship have not been explored.

METHODS

We analyzed data from 22,205 eligible adults in the U.S. National Health and Nutrition Examination Survey (NHANES), linked to mortality records from the National Death Index (NDI). DI-GM scores were calculated based on 14 food components associated with gut health. Physical activity levels were assessed using the Global Physical Activity Questionnaire (GPAQ), with total activity calculated in metabolic equivalent (MET) values. Cox proportional hazards regression models were employed to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) to evaluate both the independent and joint associations between DI-GM, physical activity, and mortality.

RESULTS

During a median follow-up of 6.75 years, 1,454 all-cause deaths occurred. Compared to participants in the lowest DI-GM quartile, those in the highest quartile had a lower risk of all-cause mortality (HR = 0.82, 95% CI: 0.70–0.96). Regarding physical activity, middle-intensity and high-intensity physical activity were associated with 10% and 19% reductions in mortality risk, respectively, compared to low-intensity physical activity (HR = 0.90, 95% CI: 0.82–0.98; HR = 0.81, 95% CI: 0.69–0.93). Participants with both the highest DI-GM scores and high-intensity physical activity exhibited a 26% decreased risk of mortality (HR = 0.74, 95% CI: 0.56–0.98) compared to those with the lowest DI-GM quartile and low-intensity physical activity. Additionally, higher DI-GM scores and more intense physical activity were associated with lower risks of heart disease mortality.

CONCLUSIONS

This study demonstrates the independent and joint benefits of a gut microbiota-promoting diet and physical activity in reducing mortality risk. These findings highlight the importance of incorporating both dietary and physical activity interventions in public health strategies aimed at improving longevity.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

1. Evaluation of dietary patterns and all-cause mortality: a systematic review.
2. Effects of aronia berry (poly)phenols on vascular function and gut microbiota: A double-blind randomized controlled trial in adult men
3. Exploring changes in the human gut microbiota and microbial-derived metabolites in response to diets enriched in simple, refined, or unrefined carbohydrate-containing foods: A post hoc analysis of a randomized clinical trial
4. A new aging measure captures morbidity and mortality risk across diverse subpopulations from NHANES IV: a cohort study
5. Association of the newly proposed dietary index for gut microbiota and depression: the mediation effect of phenotypic age and body mass index

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6. The Development and Evaluation of a Literature-Based Dietary Index for Gut Microbiota
7. Microbiome connections with host metabolism and habitual diet from 1098 deeply phenotyped individuals.
8. A posteriori dietary patterns better explain variations of the gut microbiome than individual markers in the American Gut Project
9. Dietary patterns and cancer risk
10. Role of the gut microbiota in nutrition and health.

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OAP53_08

EFFECT OF SIMPLIFIED APPROACH ON RECOVERY OF CHILDREN 6–59 MONTHS WITH WASTING IN ETHIOPIA: A NON-INFERIORITY, CLUSTER RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Worldwide, nearly 45 million children under the age of five years were affected by wasting in 2022. Ethiopia has been challenged by disasters increasing the caseload of children with wasting. This study aimed to determine the effect of a simplified approach on recovery of children with severe acute malnutrition as compared to the standard protocol.

METHODS

A cluster randomized, controlled, non-inferiority trial was carried out in three regions of Ethiopia from December 4, 2021, to July 30, 2022. A total of 58 clusters (health posts) were randomized into intervention and control groups. Children with severe acute malnutrition (SAM) in the intervention groups received two sachets of Ready to Use Therapeutic Food (RUTF), whereas children in the control groups received RUTF based on their body weight. Children with moderate acute malnutrition (MAM) received one sachet of RUTF and one sachet of Ready to Use Supplementary Food (RUSF) daily in the intervention and control groups, respectively. Per Protocol and Intention to Treat analysis were used to compare recovery at a non-inferiority margin of 15%.

RESULTS

Data were collected from 55 health posts and 1,032 children. In the PP analysis, the recovery rate of children with wasting among the simplified group (97.8%) was non-inferior to the standard protocol group (97.7%), P= 0.399. The RUTF cost per treatment of child with SAM was 56.55 USD for the standard versus 42.78 USD for the simplified approach.

CONCLUSIONS

The simplified approach is non-inferior to the standard protocol in terms of recovery and has a lower cost of RUTF. Further study is recommended to assess the effectiveness of the simplified approach in emergency contexts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP53_09

PERCEPTION AND ACCEPTANCE OF MICRONUTRIENT-FORTIFIED BOUILLON AMONG NON-INDEX HOUSEHOLD MEMBERS OF WOMEN AND CHILDREN IN A RANDOMIZED TRIAL IN NORTHERN GHANA

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BACKGROUND AND OBJECTIVES

Bouillon cube fortification could serve as a scalable, culturally appropriate strategy to address micronutrient deficiencies (MNDs) in West Africa. Household members' perceptions and acceptance of bouillon cubes are critical to any such strategy.This study aimed to examine changes in perception and acceptance of study-supplied bouillon cubes over time and explore the drivers and barriers influencing these changes among non-index household members (NIHM) in an intervention trial in Northern Ghana.

METHODS

This longitudinal mixed-METHODS study was nested in a doubly-masked clinical trial in the Kumbungu and Tolon districts in northern Ghana, in which households of index participants received rations of multiple micronutrient-fortified bouillon cubes (vitamins A and B12, folic acid, iron, zinc and iodine) vs. control bouillon cubes (iodine) for 9 months. One NIHM (≥15 years) per household was randomly selected for the study. During the first two months (early intervention, n = 731) and the final two months (late intervention, n = 796) of the intervention, quantitative data were collected using a 29-item questionnaire, most of which elicited responses on a 5-point Likert-scale. A total of 18 items (8 for perception, 10 for acceptance) were validated (Factor analysis) and used to calculate composite scores (normalized sums of weighted items) for perception and acceptance at both time points, with higher scores indicating greater perception or acceptance. Bayesian linear mixed-effects models were used to assess changes in perception and acceptance. Focus group discussions (n = 24) were conducted at the intervention midpoint and analyzed using Latent Dirichlet Allocation to explore cultural, sensory, and health influences.

RESULTS

Mean age was 40 years, with 59% being females. Perception scores increased significantly over time (3.4 ± 1.1 to 4.1 ± 0.6; Mean Difference (MD) = 0.70, 95% CI: [0.63, 0.86]), indicating a positive change. In contrast, acceptance scores remained consistently high throughout the study (4.59 ± 0.38 to 4.58 ± 0.35; MD = -0.01, 95% CI: [-0.06, -0.04]), with no differences observed between intervention groups. Key drivers of bouillon acceptance included perceived health benefits, sensory appeal, and cultural compatibility with traditional meals; barriers to acceptance included misconceptions about bouillon cubes causing long-term infertility in males and occasional changes in food color.

CONCLUSIONS

The study-supplied bouillon cubes were highly accepted, indicating that bouillon fortification has the potential to combat MNDs. Targeted education is needed to address misconceptions

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 55 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP55_01

ASSOCIATION OF DIETARY PATTERNS WITH CENTRAL OBESITY AMONG ADULTS: THE CHINA NUTRITION AND HEALTH SURVEILLANCE 2015–2017

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BACKGROUND AND OBJECTIVES

With the development of the economy and the change in dietary structure, the prevalence of central obesity has changed significantly in the world. The dietary pattern can reflect the comprehensive effects of food and nutrients, and effectively study the relationship between diet and human health. It is necessary to study the association between dietary patterns and central obesity. The purpose of this study was to extract the dietary patterns among Chinese adults aged 18 and above and to explore its relationship with central obesity.

METHODS

The data was from the China Nutrition and Health Surveillance (2015-2017), a national representative survey, and the sample participants were obtained by stratified, multi-stage, and random sampling. A total of 61,222 adults aged 18 or older from mainland China were included in this study. According to The Criteria of Weight for Adults promulgated by China（WS/T 428—2013, central obesity of Chinese adults can be judged based on the waist circumference. The prevalence of central obesity was calculated using the complex sampling weighting method. Dietary patterns were extracted by exploratory factor analysis. The relationship between Dietary patterns and central obesity and its components was analyzed by multivariate logistic regression and the models were adjusted by potential confounding covariates.

RESULTS

There were four dietary patterns were extracted, namely the " classical pattern", "vegetarian pattern", "sugar-oil pattern", and "western staple food pattern". After adjusting for all confounding factors, adults in the Q4 group of the classical pattern were less likely to have central obesity than those in the Q1 group (Q4 Vs. Q1, OR = 0.865,95 % CI = 0.802-0.932, *P*-trend < 0.0001). There was no significant association between the vegetarian pattern and central obesity (Q4 Vs. Q1, OR = 1.042,95 % CI = 0.973-1.115, *P*-trend = 0.0959). The sugar-oil pattern increased the risk of central obesity (Q4 Vs.Q1, OR = 1.168,95 % CI = 1.091-1.250, *P*-trend < 0.0001). The OR values of central obesity in the Q2 and Q3 groups of western staple food patterns was 1.077 and 1.103, respectively, compared with the Q1 group.

CONCLUSIONS

The findings suggest that the adults who stick to the classical pattern have a lower risk of central obesity. The current study provides nationally representative evidence for controlling central obesity in China.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP55_02

FORTIFIED MAIZE LUNCHES ON TEA ESTATES INCREASE MICRONUTRIENT INTAKE AMONG WORKERS IN MALAWI

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BACKGROUND AND OBJECTIVES

Evidence on the impact of workforce nutrition programmes on dietary improvements for low wage workers in low- and middle-income countries is limited. Malawi's tea sector, employing around 50,000 workers and sourcing from 17,000 farmers, served as the setting for this study. The aim was to assess whether a workforce nutrition programme in selected Malawian tea estates was effective in improving diet quality among tea estate workers through the provision of fortified maize lunches.

METHODS

The implementation activities for estate workers focused on increasing access to fortified foods by supporting estate managers with procuring and installing dossifiers, providing linkages to premix suppliers, training of millers, and providing external quality control checks to confirm compliance with the Malawi standard for fortified maize flour. Monitoring data on the compliance of maize fortification in the estates were collected. A pre-post repeat cross-sectional survey was conducted to collect quantitative and qualitative data.

RESULTS

Nearly all estate workers indicated they received a (daily) lunch at their estate, although only 25% of the workers were aware of their lunch being fortified at endline. Monitoring data showed that two estates had installed a dossifier before the start of the project but were not fortifying, and 12 estates installed one during the project. At the end of the project, 14 estates were providing adequately fortified lunches to their workers leading to up to a maximum of 23,009 workers during high season consuming fortified maize lunches approximately five to six days a week. All estates that installed dossifiers performed satisfactorily with acceptable nutrient contents by the end of the project. Based on 100g servings, the fortified maize flour provides males >50% of the Estimated Average Requirements (EAR) for folate, iron, vitamin B1, vitamin B12, and zinc and females >50% EAR for folate, vitamin B12, vitamin B1, and zinc. Unfortified maize flour does not provide >50% EAR for any of the analysed micronutrients.

CONCLUSIONS

The diets of estate workers improved in quality through increased micronutrient adequacy. Fortification is one of the most effective nutrition interventions and as the approach is very scalable it has the potential to extend to all tea workers (and beyond) in Malawi. A more effective approach to increasing awareness of fortification could be considered. Sourcing reliable pre-mix was a barrier to fortification and was mitigated by linking the estates to suppliers through the GAIN premix facility.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP55_03

HEALTHFUL AND UNHEALTHFUL PLANT-BASED DIET DURING PREGNANCY AND CHILD NEURODEVELOPMENT UP TO AGE 6

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BACKGROUND AND OBJECTIVES

Reducing the consumption of animal foods is a major environmental, public health and economic challenge (1). This study aimed to investigate the association between maternal plant-based diet during pregnancy and child neurodevelopment up to age 6.

METHODS

The study included 11,269 children from a French national birth cohort. Maternal diet during the last trimester of pregnancy was assessed postpartum using a validated food frequency questionnaire. The plant-based diet was measured with the Plant-based Diet Index (PDI) and its sub-scores: the healthful PDI (hPDI) for nutritionally high-quality plant-based diets and the unhealthful PDI (uPDI) for low-quality plant-based diets. Child neurodevelopment was assessed through several measures: parents evaluated overall development (Child Development Inventory, CDI) at 1, 3.5, and 5.5 years and language development (MacArthur-Bates Inventory) at 2 years; investigators measured non-verbal reasoning (Picture Similarities test from the British Ability Scales) at 3 years; and teachers assessed school achievements in mathematics and reading at ages 4 and 6. Associations between maternal diet and child neurodevelopment were analyzed using regression models adjusted for confounding factors such as socioeconomic status and parental cognitive background, but also for newborn and infant feeding characteristics.

RESULTS

The PDI and the hPDI were positively associated with the global developmental score at age 3.5 (β [95%CI] = 0.22 [0.03 ; 0.41] and 0.20 [0.04 ; 0.35] for 10-point increases in PDI and hPDI, respectively). Similarly, they were positively associated with mathematics scores (β [95%CI] = 0.03 [0.01 ; 0.06] and 0.04 [0.01 ; 0.06]) and reading scores (β [95%CI] = 0.04 [0.01 ; 0.07] and 0.05 [0.02 ; 0.07]) at age 6. Conversely, the uPDI was negatively associated with all neurodevelopmental scores up to age 6.

CONCLUSIONS

The findings suggest that higher scores on the plant-based diet index are associated with a better child neurodevelopment. However, they also highlight the importance of considering the dietary quality of plant-based diets, as lower-quality plant-based diets was linked to poorer neurodevelopment scores. These findings need to be confirmed in studies with higher number of vegetarian and vegan women.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP55_04

MICRONUTRIENT STATUS OF ELDERLY WITH HIGH RISK CAID SCORE FOR DEMENTIA

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BACKGROUND AND OBJECTIVES
Population ageing due to increased life expectancy is associated with the burden of several age-related disorders, particularly cognitive impairment and dementia. Dementia is a multifactorial process influenced by genetic and environmental conditions, including nutrition, and RESULTS from lifelong interactions between protective and risk factors. If the lifestyle-related risk factors are controlled or modified through appropriate interventions, these can potentially reduce the risk of dementia substantially. The Cardiovascular Risk Factors, Aging, and Incidence of Dementia (CAIDE) risk score is a validated tool to predict the risk of dementia. Hence, in this study, we have evaluated the status of micronutrients among middle-aged and older adults with high-risk CAIDE scores in the Indian context.
METHODS

This community-based cross-sectional study involved 471 middle-aged and older adults residing in Telangana, a southern state in India. Information on variables required to estimate CAIDE score: age, gender, level of education, BMI, physical activity, systolic blood pressure and total cholesterol was collected and measured. In addition, blood levels of important vitamins were estimated by HPLC and immunoanalyzer.

RESULTS

Among the study participants, 40% of subjects had a predicted risk of dementia indicated by a CAIDE score of more than ≥9.0 (n=189). The proportion of participants with a risk (≥9.0) for dementia was higher in rural areas (56%) compared to urban areas (28%). The overall prevalence of deficiency of vitamin B2 was strikingly high (63%), followed by vitamins B12 (54%), D (50%), B6 (34%), and B9 (15%) in the total cohort. Further, the prevalence of deficiency of vitamins D (57%), B2 (72%), B6 (44%), B9 (16%), and B12 (65%) was greater in the high-risk group compared to low-risk group D (42%), B2 (60), B6 (27%), B9 (13%), and B12 (45%), respectively.

CONCLUSIONS

The study demonstrated a higher prevalence of multiple subclinical vitamin deficiencies in people with a risk for dementia when compared to those with no risk. Further, this study suggests the necessity for nationally representative data to direct the appropriate nutritional intervention for middle-aged and older adults with a risk of dementia to mitigate the risk of onset of dementia.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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VITAMIN A INTAKE AND STATUS AND ASSOCIATIONS WITH IRON STATUS, ANEMIA, AND BIRTH OUTCOMES OF PREGNANT WOMEN IN THE FREE STATE PROVINCE, SOUTH AFRICA

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BACKGROUND AND OBJECTIVES

Vitamin A deficiency (VAD) is a public health challenge among pregnant women and has been linked to maternal anemia and adverse birth outcomes, such as preterm delivery, intrauterine growth restriction, and low birth weight (1-4). In the Free State Province of South Africa, there is limited information on the vitamin A status of pregnant women and its link with birth outcomes. Hence, this study aimed to investigate the vitamin A intake and status of pregnant women in the Free State Province of South Africa, and the associations of vitamin A status with anemia, iron status, and birth outcomes.

METHODS

Cross-sectionally, venous blood was taken from 427 pregnant women to measure biomarkers of vitamin A status (retinol binding protein 4 (RBP4)), iron status (ferritin, soluble transferrin receptor), and anemia (hemoglobin (Hb)). Sociodemographic information, HIV exposure, birth outcomes (birth weight and gestational age at birth), and dietary vitamin A intake data were obtained using a questionnaire in a structured interview

RESULTS

Median dietary intake of vitamin A was 1007 µg RAE/d, with 19% of participants having an intake below the estimated average requirement of 550 µg/d. Median RBP4 concentration was 1.66 (0.90) µmol/L. The prevalence of insufficient and deficient vitamin A levels was 8.7% and 0.9%, respectively. Hb and ferritin concentrations were higher among participants with adequate vitamin A compared to those with insufficient or deficient vitamin A levels (11.2±1.46g/dL, vs 10.7±1.69g/dL, p=0.033) and (23.2 µg/L, vs 18.5 µg/L, p=0.022), respectively. RBP4 was positively associated with Hb (β=0.360, 95%CI: 0.181-0.539, p <0.001) and ferritin (β=0.316, 95%CI: 0.096-0.536, p=0.005). No significant association between RBP4 and birth weight as well as preterm birth was observed.

CONCLUSIONS

The low prevalence of VAD in the study population is of no public health significance. Nonetheless, the positive association between vitamin A and Hb as well as ferritin concentrations highlights the importance of adequate vitamin A status in preventing maternal anemia in pregnancy.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP55_06

THE IMPACT OF MASLD ON BONE HEALTH IN ADULTS AGED 50 AND OVER: A MONOCENTRIC RETROSPECTIVE STUDY

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BACKGROUND AND OBJECTIVES

The global rise in the prevalence of obesity with metabolic dysfunction and fatty infiltration in the liver(MASLD) linked to poor nutrition and irregular lifestyle is of concern. The current study aims to evaluate the incidence of obesity, nutritional deficits, and their correlation to MASLD and bone health.

METHODS

A post-observational clinical study (n=306) was conducted on urban Indians aged 50-75 years (213 females. 93 males). Documented data: Anthropometric, Biochemical, Ultrasound, Bioelectrical impedance analysis(BIA), and DEXA scan(bone density) were analyzed using ANOVA and Pearson's correlation ($p<0.05$).

RESULTS

A higher incidence of central obesity (WHtR) was noted in 87.6 % of the study group with BMI indicating obesity in 93% of females vs 87.1% of males. Incidence of metabolic dysfunction was higher in females with 36.6% having diabetes compared to 28% males; pre-DM was seen in 40% and 47% respectively. Mean HbA1C values were above 6.5 in both genders. High TG levels in males 51.6% vs 46.5% in females; low HDL-C in 76.5% of females vs 51.6% in males indicated dyslipidemia. Elevated SBP and DBP were noted in 24.8% of the group. WHR showed a strong positive correlation with all MetS indicators; HDL-C exhibited a strong inverse correlation. The incidence of MASLD with ≥3 comorbidities was higher in females 68.1%vs57% in males. Nutritional deficiencies of micronutrients were noted especially with Vitamin B12 deficiency (≤197pg/mL) in 20% and nutritional Anemia seen in 32% of females vs 35% of males. WHtR suggesting central obesity showed an inverse relation with serum Calcium levels. Severe vitamin D deficiency was seen in 61% of females and 74% of males. Incidence of Osteopenia was ≥ 52% in both genders; whereas Osteoporosis was higher in females 28% vs 17% in males. Dexa scan of females with MASLD and Osteopenia showed low bone mass in the spine(37%)and femur (31%). High fracture risk was seen in females with MASLD and Osteoporosis at the spine(24%) and femur(18%).

CONCLUSIONS

The aging urban population in India is increasingly affected by obesity, metabolic disorders, poor blood sugar control, and bone degeneration due to unhealthy diets and sedentary habits. Raising awareness about the importance of healthy eating is crucial, as well as focusing on adequate protein and micronutrient intake, especially Vitamin D, and the need for physical activity. This approach can help prevent obesity, metabolic degeneration and improve bone health ensuring better health outcomes for individuals over 50.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP55_07

MATERNAL CHARACTERISTIC AND BEHAVIOUR OF PREGNANT WOMEN ASSOCIATED TO THE ADHERENCE OF MULTIPLE MICRONUTRIENTS SUPPLEMENT CONSUMPTION: REPORT FROM THE IMPLEMENTATION STUDY IN INDONESIA

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BACKGROUND AND OBJECTIVES

The biggest problem of existing iron folic acid (IFA) program in Indonesia is the adherence. Meanwhile WHO recommend the use of Multiple Micronutrients Supplement (MMS) for pregnant women. An implementation research on the use of MMS for pregnant women is conducting in 25 districts in Indonesia to find out the best strategy on program implementation. This study is a part of the on-going research, focusing to analyse the association of maternal characteristic and behaviour with the adherence of MMS consumption.

METHODS

A prospective study was conducted in 2 districts area, in East Java Province and Central Kalimantan Province. Three Public Health Centers (PHC) randomly selected in each district as study area. Subject of study were pregnant (PW) women who received MMS starting at the first trimester (< 12 weeks). The sample size was 575, screened from 1073 pregnant women enrolled in PHC. The outcome variable was the adherence of MMS consumption, assessed by calculating number of tablets consumed during first 3 months.The cut off point of 70% of 90 tablets was used, consider the emesis in the first trimester. Maternal characteristic (age, education, working status, gestational age, parity) and maternal behaviour (willingness to consume supplement, believe the MMS safety, believe the MMS benefit, and antenatal care visit were observed. Descriptive analysed was carried out to perform the data.

RESULTS

PW with good adherence (consume at least 63 tablets) were 53,2% (n=306), and 46,8% (n=269) consumed < 63 tablets (less adherence). Majority (59%) of pregnant women were age 20-29 years. Proportion of PW with good adherence is higher in the younger age (< 20 years) and older age (>35 years), 62,7% and 63,2% respectively. Low educated PW tend to have good adherence (57,9%) compare to the higher educated PW (48,1%). There are no different adherence between working status, as well as gestational age. Proportion of women with good adherence was higher among PW with parity of 3 (65,2%) compare to less parity (53%). PW with good will tend to consumed more than 63 tablets (53,4%), meanwhile PW with low willingness only 25% consumed MMS more than 63 tablets. All PW were believe that MMS is safe and more benefit to be consumed.

CONCLUSIONS

The adherence of MMS consumption associated with maternal age, parity and education level, but not working status and gestational age. Low education level and high parity may have better willingness to consumed MMS, and tend to have good adherence

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 61 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP61_01

THE ROLE OF BEEF FOR THE AFFORDABLE AND ADEQUATE PROVISION OF BIOAVAILABLE NUTRIENTS IN SUSTAINABLE DIETS THROUGHOUT THE LIFESPAN

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BACKGROUND AND OBJECTIVES

A promulgated global shift towards reduced animal-sourced food consumption is largely in response to the perception that animal food production is environmentally unsustainable, and that animal-sourced foods can be seamlessly replaced as a nutrient source by plant-based foods (1,2). However, these assumptions seldom consider the higher quantity and greater quality (bioavailability) of essential nutrients that are naturally present and economically viable when foods are sourced from animals compared to plants (3,4). With beef being a rich natural source of higher quality protein and bioavailable micronutrients (5,6), the inclusion levels of beef in least-cost nutritionally adequate dietary patterns were assessed throughout the life stages.

METHODS

Diet optimization models were developed to formulate least-cost dietary patterns that would meet daily energy and nutrient requirements for different age-sex population groups in the United States (US). The Linear Programming approach, with the objective to minimize daily diet cost, simultaneously take into account commonly available foods (7), food serving sizes (8), energy and nutrient requirements (9), and food prices (10). Bioavailability estimates for protein, amino acids, vitamins, iron, and zinc, were applied to their contents in foods, to consider nutrient bioavailability and ascertain whether beef was included in modelled least-cost nutritionally adequate mixed diets.

RESULTS

Animal-sourced foods, such as beef liver, milk, eggs, and fish, were needed in least-cost nutrient adequate dietary formulations, when nutrient contents in foods were given on a total basis. When dietary nutrient contents were expressed in bioavailable units, more animal-derived foods, particularly beef meat for the lowest cost provision of bioavailable protein, bioavailable vitamin A, and bioavailable zinc, were included in the modelled least-cost nutrient adequate diets. When nutrient bioavailability was taken into consideration, daily diet cost increased by 24-89 %. For example, for an average US adult, least-cost nutrient adequate diet on a total dietary nutrient basis, had a daily retail cost of US $ 1.14, compared to US $ 5.94 when the least-cost diet used bioavailable nutrient contents.

CONCLUSIONS

Beef was favorably included in adequately nutritious mixed diets at the lowest retail cost for the US population, due to their high nutrient density and bioavailability, and cost effectiveness. It is crucial to account for nutrient bioavailability to achieve nutrient adequacy, food security, and diet affordability.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP61_05

EATING JETLAG AND RISK OF CARDIOVASCULAR DISEASE: PROSPECTIVE STUDY OF A LARGE FRENCH COHORT

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BACKGROUND AND OBJECTIVES

Social jetlag corresponds to the misalignment between biological circadian rhythms and the social rhythm imposed by society, resulting in discrepant activity/sleep schedules during work and free days. It has been associated with worsened biological parameters such as BMI or glycemic control. Eating jetlag is a related yet emerging concept defined as the difference of meal timing between free and work days. However, it has been little explored. This study aims to evaluate the association between eating jetlag and the risk of cardiovascular disease (CVD).

METHODS

Dietary, anthropometric, socio-demographic and health data of 104,837 participants (79% women, mean age=42.7 years (14.6 SD)) were collected from the NutriNet-Santé cohort cohort. Eating jetlag was calculated using time of first and last caloric intakes on weekdays and weekends, from repeated 24h-dietary records, averaged during the 2 first years of follow-up. It was assessed as a continuous variable or as 3 categories: “Advance”, “Maintenance”, “Delay”, compared to work days. CVD was self-reported and validated against medical records. The associations between eating jetlag and CVD risk were assessed through adjusted Cox models.

RESULTS

During a median follow-up time of 8.1 years, 2,368 CVD cases were diagnosed. Eating jetlag showed a U-shaped association with CVD risk (HR Advance vs. Maintenance=1.05 (95% CI: 0.87-1.26); HR Delay vs. Maintenance=1.08 (0.96-1.21)). When the absolute value of eating jetlag was considered, there was a linear association with CVD risk (HR per 1-hour increase=1.05 (1.00-1.12)). These linear trends were confirmed in categorial models (Low: ≤1h; Moderate: 1h< to ≤2h; High: >2h): HR Moderate vs. Low=1.05 (0.94-1.18), and HR High vs. Low=1.13 (0.94-1.37); however, statistical significance was not reached.

CONCLUSIONS

Our RESULTS suggest a potential role for meal timing regularity between free and work days in CVD etiology. They need to be replicated in other studies and mechanisms are yet to be fully understood.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP61_07

EVALUATING THE IMPACT OF FRONT-OF-PACKAGE NUTRITION LABELS ON CONSUMER'S FOOD CHOICES AND PERCEPTION IN A TIME-PRESSURED ENVIRONMENT

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BACKGROUND AND OBJECTIVES

Front-of-package nutrition labelling (FOPNL) serves as a public health tool to guide consumers quickly toward healthier food choices. Recognizing its potential, the EC aimed to introduce a harmonized FOPNL but faced disagreements preventing its implementation. Among the proposed systems, the French Nutri-Score (NS) faced some opposition, prompting Italy to propose the NutrInform Battery (NI), while the Multiple Traffic Lights (MTL) emerged as a middle-ground solution. This study investigates the impact of these FOPNLs on food choices compared to the standard nutrition facts table (NFT) under time pressure. Additionally, it explores familiarity, understanding, and subjective preferences of FOPNLs in Germany, with implemented NS, and Slovenia, with no FOPNL in place.

METHODS

An online choice experiment with a between-group design evaluated consumers food choices based on three product attributes: healthiness level indicated by FOPNL (3 levels), presence of the EU organic logo, and price (3 levels). Participants from Germany (n=820) and Slovenia (n=821) were randomized into four groups per country, each exposed to a different FOPNL format: NS, NI, MTL, or NFT. Under time pressure (20s per choice), participants made 10 choices, selecting between breakfast cereals or yogurts within each decision. The study included ranking tasks to assess FOPNL understanding, along with questions on preferences and familiarity. Choice data were analyzed using Bayesian estimation.

RESULTS

FOPNLs improved participants food choices, with notable differences between countries. MTL was most effective in Slovenia, whereas NS performed best in Germany. These differences were linked to familiarity—NS was most recognized in Germany (95%) and MTL in Slovenia (53%). However, understanding played an even greater role. Not understanding FOPNLs resulted in worse food choices compared to not understanding the NFT. Participants in both countries subjectively preferred MTL, while NS had the highest understanding among FOPNLs. All FOPNLs outperformed NFT in objective understanding.

CONCLUSIONS

This study offers key insights into FOPNL research, supporting discussions on implementing a mandatory system across Europe. The findings underline the importance of familiarity and understanding in FOPNL effectiveness and their consideration in policy design. FOPNLs demonstrate the potential to improve food choices compared to NFT, provided consumers understand and recognize them, highlighting the need for education and awareness campaigns to enhance their impact.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP61_09

ASSOCIATION BETWEEN WHOLE GRAIN CONSUMPTION BEHAVIORS AND ITS DIETARY BELIEFS IN TAIWAN

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BACKGROUND AND OBJECTIVES

Whole-grain (WG) foods are rich in essential nutrients that promote health. Numerous studies have demonstrated that increased WG consumption is strongly linked to a significant reduction in the risk of various non-communicable diseases and supports weight loss. Given the health benefits of WG consumption and supporting evidence, Taiwan has actively promoted WGs and unrefined cereals, recommending that these foods make up at least one-third of daily staple food intake. However, as WGs are not a traditional part of Taiwanese dietary culture, this presents challenges for policy implementation. Few studies have explored the relationship between individuals' WG consumption behaviors and dietary beliefs. This study aims to examine this connection using data from the Nutrition and Health Survey in Taiwan (NAHSIT).

METHODS

This study analyzed data from the "NAHSIT" (2017–2020), involving 4,228 participants (aged 16–64) with complete responses on WG dietary beliefs. Chi-square tests and logistic regression were used to examine participant characteristics. Factor analysis was conducted to summarize the opinions and experiences of the population regarding WG foods. The factor scores were categorized into tertiles, and logistic regression was performed to identify factors associated with self-reported adherence to the recommended WG intake.

RESULTS

Only 5.43% of individuals in Taiwan self-reported meeting the recommended daily intake of WG foods. Individuals with positive beliefs were 2.05 times more likely to meet the recommended WG intake (exhibiting a dose-response effect), with key factors including "substituting refined grains with WGs for better nutritional balance" and "feeling more comfortable after consuming WGs". Conversely, those with lower agreement to negative beliefs were more likely to meet the recommendations (also showing a dose-response effect), with influential factors being "poor taste of WGs", "infrequent preparation at home", and "difficulty increasing WG intake".

CONCLUSIONS

In Taiwan, few people meet the recommended daily WG intake. Beliefs, along with modifiable factors like accessibility, availability, taste, and awareness, play a key role. Supporting WG consumption through environmental changes can improve dietary habits and boost intake.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 62 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP62_01

RELIABILITY OF A 29-FOOD GROUP PAST DAY DIETARY SCREENER

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BACKGROUND AND OBJECTIVES

The [RETRACTED] Healthy Diet (PHD) survey is a user-friendly, dietary screener of past day consumption of 29 major food groups that has been shown to take less than 5 minutes to complete. The survey was previously validated using same-day dietary information from the Automated Self-Administered 24-hour recall (ASA24) with a mean kappa of 0.44 and 15/29 items exhibiting moderate to strong agreement with the ASA24. The objective of this study was to assess the within-person reproducibility of the PHD survey across 1-3 weeks.

METHODS

The Community Health, Access to Nutrition, and Grocery Experiences (CHANGE) Study enrolled 184 individuals from a low-income, low-food access neighborhood. At enrollment and at follow-up 7-21 days later, individuals reported the number of times (ranging from 0 to +5) each food group was consumed on the prior day using the PHD survey. For each of the 29 food groups, we estimated agreement between enrollment and follow-up using weighted kappa statistics. We summed food groups according to major dietary components (i.e., fruits and vegetables, dairy, animal protein, plant protein, whole grains, and refined grains) and calculated interclass correlation coefficients (ICC) with 95% confidence intervals across timepoints. We also examined stratified ICCs for reporting of fruit and vegetables by demographic characteristics.

RESULTS

Among 117 (63.6%) individuals with both baseline and follow-up surveys, the mean age was 49.9 years (SD 14.7), 87% were non-Hispanic Black, 59.0% were women, and 61.5% were enrolled in the US Supplemental Nutrition Assistance Program (SNAP). There was only slight agreement (weighted kappa ≤0.2) between baseline and follow up for 21 of the food groups; fair agreement (weighted kappa 0.21–0.40) for 9 food groups; and moderate agreement (weighted kappa >0.4) for 1 food group (alcoholic drinks). The ICCs for the summed major dietary components ranged from 0.14 for refined grains to 0.40 for fruit and vegetables. ICCs for fruit and vegetables varied slightly across some characteristics such as gender (men ICC=.29 [.01, .52]; women ICC = 0.42 [0.21, 0.59]) and employment (employed ICC 0.47 [0.20, 0.67]; unemployed ICC=.16 [-.10, 0.40]; retired ICC=0.58 [0.19, 0.81]).

CONCLUSIONS

These findings indicate fair to moderate agreement in some food groups between repeated instances of the PHD diet screener. More research is needed to understand how to optimize the reliability of the survey. These estimates of reliability may be used with regression calibration to correct single-days estimates for this brief, acceptable dietary screener.

CONFLICTS OF INTERESTS

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The authors have no conflict of interest.

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OAP62_02

PRENATAL IRON SUPPLEMENTATION AND CHILDHOOD UNDERNUTRITION: EVIDENCE FROM SUB-SAHARAN AFRICA

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BACKGROUND AND OBJECTIVES

Childhood undernutrition remains a major public health challenge in low-income countries, despite global efforts, including nutrition programs and policy interventions (1, 2). This study assesses whether prenatal iron supplementation impacts childhood undernutrition, focusing on stunting and underweight.

METHODS

Demographic Health Survey data from 26 sub-Saharan countries (n=157,767 under-five children) were analysed. Primary outcomes were stunting and underweight, while the exposures included ever iron supplementation during pregnancy and duration (none, <90 days, or ≥90 days). A generalised linear mixed-effects model was used to assess associations, with stratification by maternal education and family income. Effect sizes were reported as odds ratios (ORs) with 95% confidence intervals (CI), and p-value ≤0.05 denoting significance.

RESULTS

In sub-Saharan Africa stunting, and underweight prevalence were 29.4%, and 15.39%, respectively. Lack of prenatal iron supplementation increased the odds of stunting by 29% (aOR = 1.29, 95% CI: 1.22, 1.37) and underweight by 26% (aOR = 1.26, 95% CI: 1.18, 1.34). A trend was observed with supplementation duration: <90 days reduced stunting by 17% (aOR = 0.83, 95% CI: 0.78, 0.88) and underweight by 16% (aOR = 0.84, 95% CI: 0.78, 0.90), while ≥90 days reduced stunting by 30% (aOR = 0.70, 95% CI: 0.66, 0.74) and underweight by 25% (aOR = 0.75, 95% CI: 0.69, 0.80). Stratified analysis showed that iron supplementation significantly reduced the odds of stunting among lower educated women (aOR=1.32; 95% CI: 1.24, 1.40), and those with low family income (aOR=1.34; 95% CI: 1.24, 1.44). A similar trend was observed for underweight.

CONCLUSIONS

Prenatal iron supplementation can reduce stunting and underweight in low-income countries, particularly among women with lower education and those from low-income families. Strengthening these programs may improve childhood health outcomes in resource-limited settings, especially for disadvantaged women.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP62_03

MEAL TIMING AND RISK OF METABOLIC SYNDROME IN THE FRENCH NUTRINET-SANTÉ BIOBANK

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BACKGROUND AND OBJECTIVES

Circadian rhythm disruption has been associated with higher risks of cardiometabolic diseases and several cancers (1). Mistimed eating patterns can desynchronize circadian rhythms, and could therefore influence metabolic health (2). However, long-term associations between meal timing and the metabolic syndrome remain unclear (3). The aim of this study was to evaluate the association between mealtime and frequency, as well as chrononutritional behavior profiles and the risk of metabolic syndrome.

METHODS

We used measured biological and clinical data from 16 353 adults (72% women, 51 years ± 13.72) in the NutriNet-Santé biobank (2011-2014), and examined the associations between meal timing, assessed with repeated 24-hour dietary records during the first two years of follow-up (starting 2009), and the risk of metabolic syndrome, using modified Poisson regression models, adjusted for main confounders. Chrononutritional behavior profiles were identified through principal component analysis (PCA). We conducted additional analyses stratified by sex to explore potential differences across these subgroups.

RESULTS

At the end of follow-up (mean 2.1 years (SD=1.2)), later timing of the first meal of the day was associated with a moderately higher risk of metabolic syndrome (1,788 cases; RR per 1-hour delay = 1.05; 95% CI: 1.00-1.10). However, after adjusting for overall diet quality, this association was attenuated (RR: 1.04; 95% CI: 0.99-1.09). Overall, we found no evidence of an association between the occurrence of metabolic syndrome and the time of the last meal (RR: 0.99; 95% CI: 0.95-1.05), the number of eating occasions (RR: 1.00; 95% CI: 0.98 - 1.03), or night-time fasting duration (RR: 1.03; 95% CI: 0.99 1.07) after adjusting for diet quality. PCA revealed three distinct chrononutritional profiles: (1) frequent eating and late snacking, (2) late first meals with energy/nutrient-dense last meals, and (3) energy/nutrient-dense first meals. In men, a higher adherence to the third profile was associated with a reduced risk of MetS (RR = 0.91, 95% CI: 0.86–0.97) even after adjusting for overall diet quality.

CONCLUSIONS

In this study, in men, consuming a larger proportion of daily energy and nutrients during the first meal was associated with a reduced risk of MetS. The link between time of first meal and MetS seems to be explained by diet quality. Further investigations with a longer follow-up are needed to elucidate how meal timing influences metabolic health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP62_04

IMPACT OF PREBIOTIC CHICORY ROOT FIBRE SUPPLEMENTATION ON GUT-BRAIN AXIS AND STRESS RESPONSES IN HUMAN INTERVENTION STUDIES

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BACKGROUND AND OBJECTIVES

The gut-brain axis has emerged as a promising target for nutritional interventions to support mental health. Prebiotics, such as inulin-type fructans, may modulate mood and stress by influencing gut microbiota. To evaluate this, we analyzed data from two randomized controlled trials: SYN-ReduSTRESS and EFFICAD, which assessed the effects of prebiotics on psychological and physiological stress markers.

METHODS

The SYN-ReduSTRESS study enrolled 173 healthy men, who consumed 10 g/day oligofructose-enriched inulin or maltodextrin (control) for four weeks, followed by the Trier Social Stress Test (TSST). The EFFICAD trial included 92 adults with mild-to-moderate anxiety randomized to receive oligofructose, 2'-fucosyllactose, their combination, or maltodextrin for five weeks. Both trials measured psychological outcomes (anxiety, depression, affect), physiological stress responses (salivary cortisol, cortisol awakening response), and gut microbiota composition.

RESULTS

Prebiotic supplementation consistently reduced stress-related markers and improved mood. In SYN-ReduSTRESS, oligofructose-enriched inulin reduced subjective anxiety ($P = 0.04$) and salivary cortisol ($P = 0.002$) during the TSST paradigm, particularly in participants with high baseline cortisol levels. EFFICAD demonstrated significant improvements in mood scores (BDI-II, STAI, PANAS) and cortisol awakening response ($P < 0.001$) in oligofructose and combination groups. Microbiota analysis showed increases in *Bifidobacterium* and *Faecalibacterium prausnitzii*, positively correlating with mood improvements.

CONCLUSIONS

These studies provide compelling evidence that prebiotic supplementation can improve mood and mitigate stress-induced responsiveness via the gut-brain axis. Integrating findings highlights the potential of inulin-type fructans as nutritional strategies for mental health support, warranting further exploration into their mechanisms and broader applications.

CONFLICTS OF INTERESTS

ST, YZ and JVH are employees of BENEO GmbH/Suedzucker group, a producer of prebiotic chicory-derived inulin-type fructans

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OAP62_06

FOOD INSECURITY DURING PREGNANCY IN FRENCH GUIANA: THE SCALE OF THE PROBLEM AND ASSOCIATIONS WITH UNHEALTHY DIET

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BACKGROUND AND OBJECTIVES

The post-COVID international situation, wars and food price inflation are hampering access to food for the most vulnerable households who have no safety net against unforeseen events. While pregnant women are particularly vulnerable to food shortages and nutritional imbalances, data on food insecurity (FI) during pregnancy and associated risk factors are scarce

METHODS

A 2023 multi-center, cross-sectional study was conducted among a representative sample of 730 women during the third trimester of pregnancy in French Guiana. FI (USDA Food Security Survey Module), diet quality indicators derived from a qualitative 24-hour recall (Minimum Dietary Diversity for Women MDD-W, All-5 indicator, foods associated with risks of noncommunicable diseases), pre-conceptional nutritional status (body mass index – BMI - in 4 categories as defined by WHO) and gestational weight gain (GWG), and women's self-esteem were collected. Data were weighted to ensure sample representativeness, and modified Poisson regression was used to identify risk factors for FI during pregnancy.

RESULTS

Overall, 32.4% [95%CI: 28.9-36.0] of women lived in a food insecure household; risk factors for FI included unstable household income, unhealthy housing, lack of health insurance to cover prenatal care, living alone with children, low self-esteem and low social support. Only 52.3% [95%CI: 48.4-56.3] of women reached the MDD-W, with no difference according to the food insecure status. Significantly fewer women with food insecurity had consumed the 5 recommended healthy food groups compared to women from food secure households (7.2% vs 12.9%, p-value=0.032). In both groups, more than 80% of women had consumed sweetened drinks, and 29.6% were obese prior to conception (26.9% in the food secure group vs 35.4% in the food insecure group). Finally, 28.8% of women had excessive GWG while 40.1% had insufficient GWG, with no difference according to the FI status.

CONCLUSIONS

This study highlights an insidious situation in French Guiana that threatens the first 1000 days of children's life. Appropriate policies and actions are urgently needed to reduce food insecurity and improve dietary quality among pregnant women, with special attention to unhealthy dietary behaviors and associated health risks.

CONFLICTS OF INTERESTS
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OAP62_07

CO-DESIGN PROCESS FOR A MULTI-SECTORAL NUTRITION INITIATIVE IN NEPAL: HOW LOCAL NUTRITION ACTORS USE DATA FOR EVIDENCE-BASED PLANNING

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BACKGROUND AND OBJECTIVES

The international development community recognizes the need to co-design interventions with local actors. However, few existing tools are designed for this exact purpose. The objective of this paper is to describe the process of developing and implementing a digital tool to assist local actors in reviewing data and selecting context-appropriate interventions as part of the annual work planning process for USAID Integrated Nutrition, a multi-sectoral nutrition initiative in Nepal.

METHODS

The award's technical team developed the decision tool by reviewing existing program design documents and incorporating tacit knowledge. Using the tool, the team conducted co-design workshops from July to September 2024 in all seven provinces across Nepal, with 780 local actors from 48 districts. The decision tool was refined as it was rolled out. Adjustments included moving the tool from Excel to a digital platform with real time data entry, reducing steps, and adding user friendly features to enhance accessibility. During the workshops, participants were divided into groups by district and a facilitator guided each group through the tool. To prioritize indicators, stakeholders reviewed data from the most recent Demographic and Health Survey or Health Management Information System. To design activities, local actors proposed activities for everyone in their area and considered specific activities for underserved groups. Feedback was sought from the technical team and workshop participants.

RESULTS

The final decision tool comprised six steps: 1. assess the nutrition situation, 2. prioritize indicators, 3. conduct social and behavior change analysis, 4. design health and WASH systems activities, 5. design food systems activities, and 6. design enabling environment activities. Workshop participants appreciated the co-design process, particularly how it built their confidence and skills in using data and ownership over the plans. Suggestions to improve included translating the tool into Nepali, holding separate discussions with representatives from underserved communities due to power dynamics, and conducting workshops at the sub-district level.

CONCLUSIONS

Co-design workshops are one step in ensuring activities meet local needs, garner ownership from local actors, and advance sustainability. However, tools to guide these workshops must be designed iteratively, and information from the workshops needs to be supplemented with community consultations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP62_08

ASSOCIATION BETWEEN DIETARY FOLATE INTAKE AND BIOMARKERS OF FOLATE STATUS AMONG WOMEN OF REPRODUCTIVE AGE IN OROMIA REGION, ETHIOPIA

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BACKGROUND AND OBJECTIVES

The accuracy and utility of dietary folate intake data have been questioned because of incomplete and possibly inaccurate food composition tables (FCT) and uncertainties regarding folate bioavailability. Hence, the objective of this study was to investigate the association between dietary folate intake and biomarkers of folate status among women of reproductive age (WRA) in Oromia region, Ethiopia.

METHODS

We measured dietary folate using single observed weighed food records (WFRs) of 100 WRA with repeat studies in 40 WRA. We also collected blood samples for serum folate and red blood cell (RBC) folate analysis, using the CDC microbiological assay. We estimated the distribution of usual dietary folate intake using the Ethiopian FCT by adjusting for intra-individual variability using the National Cancer Institute method. We used Spearman's correlation to test associations between dietary folate intake and biomarkers of folate status.

RESULTS

Mean ± SD of usual dietary folate intake was 396.4 ± 93.6 µg/d and the prevalence of dietary folate inadequacy was 54.6%. Mean ± SD serum folate and RBC folate concentrations were 15.1 ± 4.7 nmol/L and 473.0 ± 138.5 nmol/L, respectively. About half (45.5%) of the WRA had low serum folate concentration (<14 nmol/L), 86.9% were folate deficient (RBC folate < 624 nmol/L) and 96.0% had folate insufficiency (RBC folate < 748 nmol/L), indicative of an elevated risk of neural tube defects. There was a very weak, non-significant correlation between dietary folate intake and serum folate (r= -0.09, p= 0.377) and RBC folate (r= 0.04, p= 0.714).

CONCLUSIONS

Both dietary folate intake and biomarkers of folate status indicate inadequate folate nutriture in the study population. However, the use of one or two WFRs does not capture individual usual dietary folate intake and there is no association between dietary folate intake and biomarkers of folate status.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP62_09

Comprehensive Large-Scale Food Fortification Assessment: Use of Policy, Industry, Diet, Costing, and Financial Landscape Assessment RESULTS to Strengthen the National Food Fortification Strategy in Madagascar

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BACKGROUND AND OBJECTIVES

Many low- and middle-income countries lack data to design LSFF strategies and inform policy processes. In Madagascar, where micronutrient deficiencies are a serious public health problem, the government released a 2020 National Strategy for Food Fortification (SNFOA) to improve micronutrient intake. However, Madagascar's large-scale food fortification (LSFF) program has not progressed beyond salt. The USAID Advancing Food Fortification Opportunities to Reinforce Diets (AFFORD) project conducted a holistic review of LSFF in Madagascar to support development of a national action plan for LSFF scale-up.

METHODS

We assessed the Malagasy LSFF policy environment; industry feasibility to deliver LSFF and access to finance; dietary inadequacy; and cost of LSFF. We reviewed the national strategy. In total, we conducted four desk reviews, 82 key informant interviews, and seven industry site visits. We analyzed interview data for themes and household consumption and expenditure survey data to identify micronutrients inadequate in the diet. We modeled the potential contribution of LSFF to achieving adequate micronutrient intake. We supported the government to hold three workshops with key stakeholders to validate the RESULTS, develop a monitoring framework, and update and cost the SNFOA operational plan.

RESULTS

In the absence of LSFF, a high proportion of Malagasy diets are inadequate in key micronutrients (thiamin [68%], riboflavin [74%], folate [91%], vitamin B12 [87%], iron [78%], and zinc [60%]). Salt is still a good fortification vehicle given its high reach and consumption, good LSFF feasibility, and access to finance for large processors. Refined oil and wheat flour are potential fortification vehicles given the high industry feasibility to fortify. Although 72% of households consume sugar, industry feasibility to fortify is moderate due to low large-scale market share. Modeling showed the potential for salt fortified with iodine, sugar and oil fortified with vitamin A, and wheat flour fortified with B vitamins and zinc to improve micronutrient intake. Insufficient resource mobilization and lack of clear plans for LSFF strategy delivery are key factors that hinder the government's LSFF program.

CONCLUSIONS

LSFF has the potential to improve micronutrient intake in Madagascar. Through USAID AFFORD support, the Government of Madagascar updated and costed its SNFOA operational plan, laying a strong foundation for the scale-up of high-quality food fortification through new and existing vehicles. Applying comprehensive LSFF assessment approaches to policy processes could strengthen LSFF programming across low- and middle-income countries.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 64 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP64_01

ASSOCIATIONS OF CIRCULATING BLOOD MICRONUTRIENTS IN EARLY PREGNANCY WITH BIRTH OUTCOMES AMONG GHANAIAN WOMEN

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BACKGROUND AND OBJECTIVES

Sufficient micronutrient status, from the onset of pregnancy are essential for fetal growth and a healthy birth outcome. However**,** detailed information on blood micronutrients in early pregnancy and their association with birth outcomes are scarce. **Objectives**: We aimed to analyse (1) concentrations and parameters of blood micronutrients in early pregnancy (≤14 gestation weeks) and (2) associations with newborns anthropometry.

METHODS

In a prospective study, women in early pregnancy were enrolled to analyse hemoglobin and other biomarkers: iron status (ferritin and soluble transferrin receptor), infection markers (CRP and AGP), fat-soluble vitamins (A, E, D), carotenoids (e.g., α-and β-carotenes), B-vitamins (folate and thiamine) and minerals (e.g., iron and zinc). The women were followed for birth outcomes, and the associations of individual blood biomarkers with newborn anthropometry (n=294) were assessed by multiple linear and logistic regressions.

RESULTS

Anemia (Hb<110 g/L) prevalence was 15.3%, while the prevalence of iron deficiency, elevated AGP and CRP was 7.8%, 7.1%, and 31%, respectively. The proportions of women with low serum vitamins D (<25 nmol/L) and E (<11.6 µmol/L) were 23% and 59%, while 65% and 68% had insufficient thiamine (<65 nmol/L) and zinc (<0.56 mg/L). The mean birth weight, length and head circumference (HC) was 3075 grams, 49.4 cm and 33.8 cm. The prevalence of preterm birth and low birth weight (LBW) was 7.1% and 10.2%, while small for gestational age (SGA) for weight, length and head circumference was 19%, 9%, and 12%, respectively. Regression models showed a positive association of serum zinc with birth weight, while retinol was inversely associated with length, and vitamin D and ferritin were inversely associated with HC. Highest tertile of zinc increased birth weight by 121 g, while the highest tertile of retinol reduced length by 0.5 cm and increased the risk of SGA for length. The highest tertiles of both vitamin D and ferritin reduced HC by 0.4 cm, and ferritin and iron increased the risk of SGA for HC. Also, elevated AGP and the lowest tertile of thiamine increased the risk of LBW and SGA for HC, respectively.

CONCLUSIONS

A high proportion of the women in early pregnancy had low zinc, vitamin D and E, and thiamine status. Higher zinc and thiamine status seemed to improve birth weight, and head circumference. The negative associations of retinol, ferritin or iron with length and head circumference may reflect indirect effects, and needs further investigation for clarification.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP64_02

RELATIONSHIP BETWEEN LEUCINE INTAKE, POLYPHENOL CONSUMPTION, AND SARCOPENIA INDICATORS IN CHILEAN OLDER ADULTS PARTICIPATING IN THE PROGRAM FOR COMPLEMENTARY FOOD IN OLDER PEOPLE (PACAM) FROM THE METROPOLITAN REGION, SANTIAGO DE CHILE

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BACKGROUND AND OBJECTIVES

Leucine supports muscle anabolism, while polyphenols reduce inflammation, both key to managing sarcopenia in older adults. Their combined effects may improve metabolic health, but the need for supplementation depends on intake levels and their relationship with sarcopenia indicators (1). This study investigates the relationship between leucine intake, polyphenol consumption, and sarcopenia indicators among Chilean older adults enrolled in PACAM from the Metropolitan Region, Santiago de Chile.

METHODS

A total of 181 older adults aged 60-80 from Santiago, Chile, were assessed. Sarcopenia indicators were evaluated through anthropometric measurements, muscle strength, and functional tests. Dietary intakes of leucine and polyphenols were determined using 24-hour dietary recalls.

RESULTS

The majority of participants (80% women) had insufficient intakes of both leucine and polyphenols, failing to meet the recommended daily doses of 3 grams and 500 mg, respectively. Sarcopenia was present in 17.1% of the older adults, correlating with these dietary deficiencies. This highlights the need for targeted dietary interventions to address these gaps in nutrient intake and support healthy aging.

CONCLUSIONS

These findings emphasize the importance of adequate dietary intake of leucine and polyphenols for maintaining muscle health in older adults. Future research should focus on evaluating the effectiveness of dietary supplements and interventions tailored to improve the intake of these nutrients to mitigate sarcopenia risk among the elderly.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP64_04

ASSOCIATION OF HOUSEHOLD WATER, SANITATION, FOOD HYGIENE PRACTICES, AND MICROBIAL CONTAMINATION WITH CHILDHOOD STUNTING: INSIGHTS FROM THE ACTION AGAINST STUNTING HUB

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BACKGROUND AND OBJECTIVES

Childhood stunting is a significant global health issue, affecting an estimated 160 million children under five years of age. Increasing evidence highlights the role of environmental determinants, particularly water, sanitation, and hygiene (WASH), including food hygiene, in influencing infection pathways. This study explores the relationship between stunting and WASH practices, with a particular focus on food hygiene, a key dimension of child health and development that has received limited attention.

METHODS

This study is part of the larger cohort study, *Action Against Stunting Hub*, which involves pregnant women. Data on WASH practices, including food hygiene, were collected from 522 children aged 0–23 months at three time points (9, 12, and 18 months). Data collection METHODS included structured interviews, spot checks, and biological sampling. Microbial hygiene indicators were assessed in weaning foods, drinking water, kitchen surface swabs, and handwashing samples. Stunting was defined in this study using the WHO growth standards as height-for-age z-scores (HAZ) less than -2 SD. Statistical analyses used the Chi-square test to identify associations between stunting and contributing factors. Data management and analysis were performed using R software, with statistical significance set at $p < 0.05$.

RESULTS

The study found that poor hand hygiene among children and mothers and contaminated kitchen surfaces and food were significant contributors to stunting. Households using piped water for cooking and handwashing had a higher prevalence of stunting (8.4%) compared to non-stunted households (2.1%). Access to running water in kitchens was notably lower in households with stunted children (60.2%) than in those with non-stunted children (72.2%; $p = 0.02$). A significant association was observed between the presence of *Salmonella* in food samples and stunting ($p = 0.029$). Additionally, fecal coliform contamination on kitchen surfaces was strongly associated with stunting ($p = 0.003$).

CONCLUSIONS

The findings underscore the importance of improving hygiene education and promoting behavioral interventions to address contamination in handwashing practices among children and mothers. The higher prevalence of *Salmonella* contamination in food samples from households with stunted children highlights the critical need for implementing effective food safety measures to reduce the risk of stunting.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP64_05

CONSUMPTION PATTERN OF COMMERCIAL SNACK FOODS AND SUGAR-SWEETENED BEVERAGES DURING THE COMPLEMENTARY FEEDING PERIOD AMONG CHILDREN LESS THAN 24 MONTHS IN IBADAN, NIGERIA

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BACKGROUND AND OBJECTIVES

Commercially produced snack foods and beverages could enhance the nutritional outcomes of young children if formulated with optimal nutrient composition. However, certain products may be nutrient-poor, promoting an increased intake of salt or sugar and displacing the consumption of more nutrient-dense alternatives. This study examined the prevalence and consumption patterns of commercially produced snack foods and sweet beverages among children aged 6–24 months during the complementary feeding period in Ibadan, Nigeria.

METHODS

A facility-based cross-sectional survey was conducted among 500 mother-child pairs with children between the ages of 6-24 months across primary, secondary and tertiary health facilities within Ibadan metropolis. A pre-tested semi-structured questionnaire including a 24h dietary recall and food frequency questionnaire were employed to obtain information on demographics and the foods consumed by the child on the preceding day and week of the survey. Data was analyzed using IBM SPSS version 25.

RESULTS
RESULTS showed that about 8 out of 10 mothers had fed their children a commercially produced snack food product since introduction of solid/semi-solid/soft foods while 52.8% and 21.4% fed at least a snack food product and sweet beverage respectively in the day preceding the survey. The commonly consumed snacks were baked and fried confections like biscuits (81.2%) and puff-puffs (47.6%), sweet confections like stick sweets (38.4%) and high sodium snacks like cheese balls (31.2%). For sweet beverages, soft drinks (41.2%), fruit-flavoured drinks (40.8%) and flavoured milk drinks (34.8%) were the most commonly consumed. The top five reasons given by mothers for feeding commercial snacks and beverages were because their children liked them, as an in-between meal option, for child distraction/pacifying, influence of older children and having older adults providing them as treats. Majority of the mothers introduced snacks (87.7%) and sweet beverages (86%) to their children between ages 6-12 months with 46.9% and 12.8% feeding their children snacks and sweet beverages respectively every day of the week.
CONCLUSIONS

Snack and sweet beverage consumption during the crucial complementary feeding period require careful evaluation as some are nutrient-dense while others contain high levels of added sugars and salt, making them inappropriate for consumption. It is recommended that nutritious snack options be promoted and national dietary standards for complementary food products be developed to improve the diets and nutrition of infants and young children.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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ENHANCING PRENATAL NUTRITION AND INFECTION CONTROL: IMPACT ON CHILD GROWTH AT 24 MONTHS OF AGE IN RURAL ETHIOPIA

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BACKGROUND AND OBJECTIVES

Maternal undernutrition and inflammation in pregnancy may have long term impacts on offspring physical growth. We aimed to determine the effect of prenatal interventions to optimize nutrition and infection management in pregnancy on longitudinal child growth.

METHODS

We conducted longitudinal follow-up of mother-infant dyads enrolled in a pragmatic, 2×2 factorial randomized clinical effectiveness study in Amhara, Ethiopia. In the parent study, 12 health centers were randomized to deliver an enhanced nutrition package (ENP) (iron-folic acid [IFA], iodized salt, and targeted micronutrient fortified balanced energy protein [BEP] supplements for undernourished women (MUAC<23cm) or routine nutrition care (IFA). Pregnant women <24 wks gestation were randomized to receive an enhanced infection management package (EIMP) (genitourinary tract infection screening-treatment and enhanced deworming) or routine infection care. Interventions were delivered from enrollment until birth. We consecutively re-enrolled a subset of offspring equally from each of the four study arms, with anthropometrics measured at 12, 18, and 24 mo. We used intention to treat analysis and calculated marginal intervention effects on 24 mo weight and length for age z-scores (WAZ, LAZ) using WHO standards, controlling for birth size. GEE was used to estimate intervention effects accounting for clustering and baseline imbalance.

RESULTS

The parent study enrolled 2399 pregnant women with 2170 known outcomes. 463 mother-child dyads were re-enrolled at 12 mo, with 423 followed until 24 mo (122 ENP+EIMP, 87 ENP alone, 109 EIMP alone, 105 neither). At baseline, pregnant women in ENP had lower education and higher rates of undernutrition compared to routine nutrition care. Mean birth WAZ was similar between nutrition arms (ENP: -0.88 (sd 1.03); not-ENP: -0.87 (0.96)), however, by 24 mo WAZ was lower in the ENP arm (ENP: -1.23 (1.05); not-ENP: -0.98 (1.02); adjusted mean difference (aMD) -0.19 (95% CI:-0.27 to -0.12)). Birth LAZ was similar (ENP: -0.48 (1.60); not-ENP: -0.49 (1.34)), and by 24 mo LAZ was -1.86 (1.04) in the ENP and -2.04 (1.35) in the not-ENP arm (aMD:+0.35 (95%CI: -0.60 to 1.30)). Among pregnancies with maternal undernutrition, children of women who received prenatal BEP had higher 24 mo LAZ (aMD:+0.53 (95% CI: 0.05 to 1.01)). There were no EIMP effects.

CONCLUSIONS

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The prenatal nutrition intervention arm was more socioeconomically disadvantaged and had greater postnatal WAZ decline, likely due to environmental factors. Among undernourished women targeted for prenatal BEP, there was improved offspring linear growth at 24 mo.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP64_09

ADHERENCE TO THE PROVEGETARIAN FOOD PATTERNS AND THE RISK OF CARDIOVASCULAR DISEASE IN A MEDITERRANEAN MIDDLE-AGED POPULATION

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BACKGROUND AND OBJECTIVES

A provegetarian food pattern (PVG) that emphasizes plant-based foods without completely eliminating animal-based foods has been linked to health benefits. Nevertheless, it is important to note that not all plant-based foods are healthy. The objective of study was to prospectively evaluate the association between provegetarian food patterns and the risk of cardiovascular disease (CVD) in the "Seguimiento Universidad de Navarra" (SUN) cohort.

METHODS

The SUN Project is a Mediterranean cohort study formed by Spanish university graduates. A previously validated semi-quantitative food-frequency questionnaire (FFQ) was used. An overall provegetarian (PVG) food pattern was derived following a previously published methodology, giving positive scores to plant-based foods and inverse scores to animal-based foods. Furthermore, healthy (hPVG) and unhealthy (uPVG) provegetarian food patterns were computed. Individuals were divided into quartiles according to their adherence to these patterns. Cox regression models were used, adjusted for potential confounders.

RESULTS

For the final analysis, 18,560 participants were included. The baseline mean age and standard deviation were 38 ± 12 years. During a median follow-up of 16 years, we registered 227 incident cases of cardiovascular disease. After adjusting for potential confounders, participants in the highest quartile of the PVG food pattern had a significant lower risk of cardiovascular disease than those in the lowest quartile [HR Q4 vs. Q1: 0.63 (95% CI: 0.42-0.93); p for trend= 0.046]. Similarly, the multivariable model showed that subjects with high adherence to the hPVG food pattern had lower risk of cardiovascular disease compared to those with low adherence [HR Q4 vs. Q1: 0.60 (95% CI: 0.40-0.90); p for trend=0.037]. In contrast, individuals in the highest quartile of the uPVG food pattern had an 76 % higher risk of cardiovascular disease compared to those in the lowest quartile [HR Q4 vs. Q1: 1.76 (95% CI:1.17-2.64)] with a significant dose-response relationship (p for trend=0.007).

CONCLUSIONS

Greater adherence to both an overall provegetarian food pattern and a healthy provegetarian food pattern reduced the risk of cardiovascular disease in a Mediterranean middle-aged population. However, higher adherence to an unhealthy provegetarian food pattern was associated with an increased risk of cardiovascular disease.

CONFLICTS OF INTERESTS

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OAP 65 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP65_01

ADIPOSITY AS A RISK FACTOR FOR IRON DEFICIENCY IN PREGNANCY

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BACKGROUND AND OBJECTIVES

Obesity and iron deficiency (ID) are both highly prevalent in pregnant women and lead to serious consequences for mother and child (1). Whilst obesity can adversely impact on nutritional status, its influence on iron status remains unclear. This study aims to investigate the influence of adiposity on prevalence of iron deficiency and iron biomarkers in pregnancy.

METHODS

A secondary analysis of the MO-VITD trial (2) was conducted, which included singleton pregnancies in women aged ≥18 years and with BMI ≥18.5kg/m2. A multivitamin that included 17 mg/d of iron was taken by all participants. Measures of BMI, fat mass, visceral fat and fat mass index (FMI) were taken/calculated at 12 gestational weeks (GW). Haemoglobin (Hb) RESULTS were recorded from clinical notes. Ferritin, transferrin saturation (TSAT), and soluble transferrin receptor (sTfR) were analysed from stored serum samples taken at 12, 28 and 36 GW. Participants were categorised by BMI as normal weight (18.5-24.9 kg/m2), overweight (25.0-29.9 kg/m2) and obesity (≥30 kg/m2). Anaemia was defined: Hb <110 g/L and used two definitions for ID: ferritin <15µg/L and sTfR >1.513µg/mL. Ferritin was adjusted for inflammation using C-reactive protein (3).

RESULTS

A total of 125 pregnant women were included (43 normal weight, 44 overweight, 38 with obesity). ID prevalence (ferritin <15 µg/L) was 7.0%, 9.1%, and 7.9% at 12 GW (p=0.936) and 35.5%, 46.9%, and 70.8% at 36 GW (p=0.032) for normal weight, overweight, and obesity. TSAT was lower in women with obesity compared to normal weight at 12 GW (23.9 ± 11.2 vs 30.3 ± 9%, p=0.006) and 28 GW (11.4 ± 4.6 vs 17.5 ± 6.5%, p<0.001). Ferritin declined more steeply during pregnancy in the obesity group, with lowest levels at 36 GW (14.4 ± 9.2 µg/L vs normal weight 20.4 ± 10.3 µg/L, p=0.027). All adiposity measures were inversely associated with ferritin (especially FMI β=-0.348, p=0.002) and positively with sTfR at 36 GW (especially visceral fat β=0.345, p=0.008). Adiposity measures predicted ID defined by ferritin at 36 GW (particularly visceral fat aOR 1.446, p=0.004) and defined by sTfR at 12 and 36 GW (particularly visceral fat 12 GW aOR 1.286, p=0.038; 36 GW aOR 1.406, p=0.015).

CONCLUSIONS

Increased adiposity significantly raises the risk of ID during pregnancy, especially in the third trimester. Improvements to current screening practices are needed to ensure that women who are most at risk of ID are identified in early pregnancy. High adiposity in early pregnancy could identify those at greater risk of ID.

CONFLICTS OF INTERESTS

MTM reports a relationship with Solvotrin Therapeutics that includes funding grants. ML reports a relationship with Solvotrin Therapeutics that includes board membership, equity or stocks, and funding grants. ML has patent #WO2017158030A1 Compositions and METHODS for increasing iron intake in a mammal issued to Trinity College Dublin and Solvotrin Therapeutics. All other authors report no conflicts of interest.

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OAP65_02

FIRST FOODS: NAVIGATING KNOWLEDGE PATHWAYS FOR INFANT AND YOUNG CHILD FEEDING WITHIN URBAN INDIGENOUS ENVIRONMENTS

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BACKGROUND AND OBJECTIVES

Generations of Indigenous women have delivered their babies with the assistance of midwives and family members (1), yet little has been published on Indigenous approaches to infant feeding and postnatal care. Decision-making must consider the larger cultural contexts (2) to offer meaningful impacts on the nutritional health and wellbeing of Indigenous infants during their early development. Study objectives included: to engage with the postnatal feeding experiences of Indigenous mothers through the process of digital storytelling; to discuss the diverse postnatal needs and challenges of families and communities within urban contexts, and to propose pathways to encourage knowledge mobilization and learning.

METHODS

Community-based participatory research (3) and digital storytelling methodologies were utilized to enhance Indigenous community capacity and agency, as well as engage with regional and national project partners. Two storytelling workshops visually captured the postnatal experiences of Indigenous mothers within cities in Manitoba and Ontario, Canada. Film screenings and focus groups with care providers took place afterwards along with interviews and sharing circles with mothers. Audio files were transcribed verbatim and thematically analysed.

RESULTS

Twelve Indigenous mothers created short films and participated in interviews and Elder-led sharing circles. Their stories were screened in each location with a total of twenty care providers who later took part in focus groups. Participants shared the importance of cultural safety and social supports through their digital stories and discussed the emotional wellness associated with community cohesion and compassion supporting their infant feeding journeys. Care providers reflected on barriers unique to cities and existing harms within colonial systems, along with the importance of humility within healthcare moving beyond cultural awareness.

CONCLUSIONS

Indigenous postnatal practices must be situated within decision-making processes around Indigenous infant and young child feeding to move beyond policies of assimilation. A collaborative approach is essential for Indigenous women in the city to feel supported in their decisions around infant and young child feeding practices, as pathways towards building Indigenous food sovereignty during these critical stages of the life course.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP65_03

Sex differences in factors associated with binge eating behaviors: RESULTS from a French national random population-based study

Junko Kose; Nathalie Godart; Caroline Huas; Alexandra Rouquette

BACKGROUND AND OBJECTIVES

Studies have suggested that sociodemographic and lifestyle-related factors as well as somatic and mental comorbidities are associated with binge eating (BE) behaviors. However, most of existing studies focused on women or on clinical sample, thus data on men in general population is scarce. The objective of the present study was to investigate sex differences in factors associated with BE behaviors in a national random sample from French population.

METHODS

The study included a sample of 84,995 participants (women: 52.1%) from the EpiCov cohort. Outcome was BE behavior (No BE; BE without compensatory behavior (BE-); BE with a compensatory behavior (BE+)) assessed using the Patient Health Questionnaire Eating Disorder module (PHQ-ED) in summer 2021. Exposures were various sociodemographic and lifestyle-related factors, and history of somatic and mental health conditions. After verifying interactions between exposures and sex for BE behaviors, adjusted multinomial logistic regressions were performed to investigate the associations between exposures and BE behaviors according to sex.

RESULTS

The prevalence of BE- and BE+ among women was 3.4 [3.2-3.7] % and 1.2 [1.1-1.3] %, respectively; that among men was 2.1 [1.9-2.3] % and 0.7 [0.6-0.8] %, respectively. Regarding BE-, significant sex difference was observed for having poor perceived health status (adjusted Odds Ratio (aOR): men 2.43 [1.91–3.09], women 1.53 [1.29–1.80], interaction p= 0.017). As for BE+, significant sex difference was observed for Body Mass Index (BMI) > 30 (vs BMI 18.5–25.0; aOR: men 6.10 [3.90–9.56], women 2.14 [1.53–3.00], interaction p= 0.003). No other sex differences were observed: younger age, suicidal ideation, and high screen use were positively associated with both BE- and BE+ in both men and women. High physical activity frequency was inversely associated with BE-, while it was positively associated with BE+ in both men and women.

CONCLUSIONS

In this large study based on a national random sample from French population in 2021, while the prevalence of BE was higher in women than in men, association between BE- and perceived health status and that between BE+ and obesity are greater in men than women. The RESULTS indicate the need to raise awareness and promote prevention strategies for men as for women.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP65_04

SODIUM REDUCTION IN THE CANADIAN PROCESSED FOOD SUPPLY BETWEEN 2010 AND 2020

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BACKGROUND AND OBJECTIVES

Canadians consume excess sodium, increasing risk for cardiovascular disease. Processed foods are the major contributors to sodium intakes and Health Canada has implemented policies, including voluntary sodium reduction targets (SRTs), to encourage industry to reduce sodium in processed foods. The objectives were to: 1) assess changes in sodium levels of processed foods in the Canadian food supply, and 2) evaluate progress toward achieving Health Canada's 2012-2016 SRTs between 2010 and 2020.

METHODS

Foods from four collections, 2010 (n=6,929), 2013 (n=9,366), 2017 (n=10,324) and 2020 (n=15,797) of the Food Label Information and Price (FLIP) database were categorized into sodium categories established by Health Canada. The average sodium content (mg/100g) and proportion of foods meeting Health Canada's SRTs were determined by category for each year. Sodium levels and adherence to the SRTs were compared across years.

RESULTS

Sodium levels did not change for most categories over any time period; 40/47 did not change between 2010-2013, 40/47 between 2013-2017 and 42/47 between 2017-2020. Between both 2010-2013 and 2013-2017, 7 categories decreased in sodium and 0 increased. Between 2017-2020, 1 category decreased and 4 increased. In key categories contributing to Canadians' sodium intakes, Bread products, Refrigerated and frozen dishes, and Packaged deli meats, sodium levels changed by 0% (449±125 in 2010 to 450±139 in 2020), -5% (344±158 to 328±133), and 5% (1092±348 to 1149±452) between 2010 and 2020. Overall, in 2010, 2013, 2017 and 2020, 28%, 34%, 38% and 35% of products met their goal SRT and 24%, 20%, 17% and 18% exceeded the maximum level.

CONCLUSIONS

Overall, sodium reduction between 2010-2020 was infrequent, with only minor progress towards achieving the SRTs between 2010 and 2017, and no progress between 2017 and 2020. These data provide a longitudinal assessment of sodium levels in processed foods in the Canadian food supply and demonstrate that voluntary SRTs are mostly ineffective when there are no consequences of non-compliance. Stronger policies, such as mandatory SRTs, are required for manufacturers to reduce the amount of sodium in processed foods.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP65_05

FOOD ENVIRONMENTS AND DIETARY INTAKE IN URBAN AND RURAL KENYA

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BACKGROUND AND OBJECTIVES

Food environment (FE) is the interface between consumers & food system.Despite increasing burdens of malnutrition in all forms, little is known about how FEs shape diets in Africa.The study assessed FE and dietary patterns of adolescents and mothers in urban & rural Kenya.

METHODS

A cross-sectional survey included 836 mother/adolescent pairs in Viwandani slum (Nairobi, urban, n=631), and Kilome sub-county (Makueni, rural, n=205), Kenya. Interviews assessed socio-demographics (mothers only), knowledge & perceptions towards healthy diets and agency. A repeated 24h dietary intake recall was used to calculate Global Diet Quality Scores (GDQS)+/-. All vendors in the study area were mapped. Factors influencing food consumption were explored using Poisson regression from glm package in R.

RESULTS

GDQS+ (healthy food consumption,max=32) was lower in urban compared to rural (urban: 5.92 mother, 5.81 adolescents; rural: 6.59 mother, 6.66 adolescents) due to lower consumption of dark green leafy vegetables (DGLV) and legumes. GDQS- (unhealthy food consumption,max 17) indicated lower consumption of unhealthy food in rural compared to urban (urban: mothers 10.5, adolescents 10.3; rural: mothers 12.1, adolescents 12.0). Majority of respondents were categorized medium risk for nutrient deficiencies and/or NCDs. Urban and rural consumers prefer Tabletop vendors (TT) and kiosks (Ki) for food purchases; wet markets were liked in the rural site. TT offered highest diversity of fruit and vegetables (F&V); 55% in both sites sold DGLV, while few sold unhealthy foods (11 and 9%). Ki offered low diversity of F&V in both sites, while 83% in urban, and 95% in rural sold unhealthy foods. In the rural area DGLV and legumes were also sourced from own produce. In urban, pocket money positively influenced GDQS+ for adolescents (IRR 1.08;p:0.04), and education level (IRR 1.29;p:0.03), employment (IRR 1.22;p:<0.02), being member of a social group (IRR 1.09;p:0.01) and exposure to healthy food promotion (IRR 1.05;p:0.005) positively influenced GDQS+ for women. In the rural site, casual labor negatively influenced GDQS+ (IRR 0.84;p:0.04) compared to farming, while being member of a social group positively influenced GDQS+ for women & adolescents (IRR 1.22; P:<0.001 and IRR 1.10;p:0.01).

CONCLUSIONS

GDQS are driven by low consumption of healthy foods, rather than high consumption of unhealthy foods in both sites.Group membership positively influenced dietary behavior. Wide-spread availability of cheap, unhealthy food in urban and rural FEs, will likely result in rapid increase of unhealth food consumption as socio-economic status improves with time.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP65_06

VOLUNTARY SALT REDUCTION IN THE FOOD INDUSTRY: TARGETS, STRATEGIES, AND CHALLENGES – INSIGHTS FROM A SCOPING REVIEW AND QUESTIONNAIRE SURVEY

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BACKGROUND AND OBJECTIVES

Voluntary reformulation of food products by the food industry is a cost-effective strategy for reducing excessive salt intake and preventing non-communicable diseases. However, practical challenges, especially for small and medium-sized enterprises in Japan, can hinder the implementation of salt reduction initiatives. This study aimed to provide insights for Japanese companies by reviewing the experiences of food industries in high-income countries.

METHODS

We conducted a scoping review of voluntary salt reduction initiatives in major food companies from high-income countries, using literature and website searches, supplemented by a questionnaire survey. The study focused on identifying salt reduction targets, including target products, sodium content criteria, and implementation timelines, as well as the incentives and challenges influencing decision-making.

RESULTS

From 19 studies and 83 companies identified, we selected 2 studies and 23 companies for analysis. One company and two trade associations participated in the survey (23% response rate). After removing duplicates, we analyzed 40 salt reduction targets from 24 companies and 2 trade associations. Of these, 21 targets focused solely on salt, while 19 also included sugar and fat. Targets were set for all products (n=25) or specific categories (n=15), such as bakery items. The majority (n=32) used company-established sodium criteria, while 8 adhered to criteria proposed by regional or national authorities. Sodium criteria were adopted by food category in 26 targets and for all products in 14 targets. The median implementation period was five years, with 65% of targets set to end in 2025. The survey revealed that corporate investment in environmental, social, and governance (ESG) goals and multi-level collaboration were key motivators for salt reduction.

CONCLUSIONS

Food companies set salt reduction targets based on practical considerations in view of global trends and government policies. A phased, collaborative approach involving industry, government, and academia could facilitate voluntary salt reduction, particularly for small and medium-sized enterprises.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP65_07

HIDDEN AGENDAS: THE USE OF CORPORATE PLAYBOOK STRATEGIES IN AUSTRALIAN GOVERNMENTAL FOOD POLICIES

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BACKGROUND AND OBJECTIVES

Food industries increasingly influence and shape food policies to enable ongoing growth and legitimise their environmentally and health-harming practices. This study examines how Australian food policies frame food-related commercial drivers of health and environmental sustainability, and how corporate playbook strategies are used in government food policies to enable, encourage and legitimise harmful food industry practices.

METHODS

We analysed over 150 federal and state food-related strategic policies in the agriculture, environment, food processing, manufacturing, and marketing sectors. A qualitative coding framework was developed to identify instances where government policies acknowledged the harmful impacts of commercial entities, or where ‘corporate playbook’ strategies were utilised to legitimise policy actions which were commercially beneficial. NVivo 13 was used to assist the coding, distinguishing between different ‘corporate playbook’ strategies such as industry engagement in policy development, public-private partnerships, self-regulation, and corporate social responsibility activities and to identify harmful practices.

RESULTS

Our findings reveal that Australian food policies rarely identify the negative impacts of food industry actions on human health or the environment. They also suggest that Australian food policies were often created in conjunction with industry. Further, government policies endorsed common 'corporate playbook' strategies such as industry self-regulation, public-private partnerships, co-investment in 'solutions', private sector funding for food systems research and privatisation of government activities. In contrast, we found limited acknowledgment of the negative impacts of food industry actions on human health and the environment, with industry usually framed as 'part of the solution' rather than a driver of health and environmental harms.

CONCLUSIONS

This research highlights a critical need for independent, robust food policies that challenge adverse industry influences. Australian food-related policies enable and legitimise industry strategies, weakening the subsequent impact of these policies on population health and environmental sustainability. Independent governance will be critical to transforming food systems to produce health and environmental benefits.

CONFLICTS OF INTERESTS

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OAP65_08

LEVERAGE AI TO DETECT UNHEALTHY CHILD-DIRECTED MARKETING IN FOOD PACKAGING

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BACKGROUND AND OBJECTIVES
Childhood obesity and diet-related noncommunicable diseases are urgent global public health challenges, driven in part by children's continued exposure to persuasive marketing of unhealthy foods and beverages. Traditional METHODS that manually evaluate child-targeted food marketing practices are resource-intensive and inefficient. This study aims to address these limitations by leveraging artificial intelligence (AI), specifically computer vision and deep learning, to identify child-targeted food products and classify marketing elements on food packaging using a comprehensive database labeled with child-directed marketing features.
METHODS

Image classification algorithms were trained and fine-tuned on 8,283 manually labeled food package images, annotated and validated using a validated child-appealing packaging (CAP) coding tool. Three machine learning algorithms, k-nearest neighbors (kNN), support vector machines (SVM), and convolutional neural networks (CNN) were used to classify food package images targeted at children. In addition, image object detection models, including fine-tuned YOLOv10 were used to identify specific child-targeted marketing features on food and beverage packaging. Model performance was evaluated using accuracy, precision, recall, F1 score, AUC, and confusion matrix.

RESULTS

A total of 22 distinct child-directed marketing techniques featured on food and beverage packages were identified and annotated. The CNN-based image classification model outperformed kNN and SVM, achieved 0.92 accuracy and 0.98 AUC in identifying food marketing targeted at children. Fine-tuned YOLOv10 object detection model demonstrated varying performance levels across child-targeted marketing features, reflecting the complexity and diversity of marketing strategies on food packaging.

CONCLUSIONS
This study introduces the first AI-driven approach to effectively identify and categorize child-directed marketing on food and beverage packaging. These METHODS can be extended to other data sources such as social media and online video content for broader applications. This study supports evidence-based policy development to protect children from unhealthy food marketing practices and provides critical insights into its potential impacts on children's health outcomes.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP65_09

ASSOCIATIONS BETWEEN EARLY-LIFE HEMOGLOBIN CONCENTRATION AND COGNITION: A LONGITUDINAL STUDY OF 9-11 YEAR OLD GHANAIAN PREADOLESCENTS

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BACKGROUND AND OBJECTIVES

Infants in low- and middle-income countries are at high risk for anemia, most commonly resulting from iron deficiency (ID). Additionally, male infants are at higher risk for ID or iron deficiency anemia (IDA) compared to female infants. Anemia and IDA during the first 1000 days may negatively affect motor, behavioral, and cognitive development. Few studies have examined the association between hemoglobin (Hb) and cognition in regions at highest risk of ID, such as sub-Saharan Africa. Our objective was to investigate the associations between Hb concentration at 6 and 18 mo of age and cognitive outcomes in 9-11 y old Ghanaian preadolescents.

METHODS

This is a secondary data analysis derived from the control group of the International Lipid-based Nutrient Supplements (iLiNS)-DYAD trial in Ghana and the 9-11 y follow-up study. Child Hb was measured at 6 and 18 mo using venous blood draws. At 9-11 y old, six cognitive tests were administered to measure general intellectual ability, literacy, arithmetic ability, declarative memory, procedural memory, and executive function. We examined the associations between 6 and 18 mo Hb values and cognitive outcomes with linear and quadratic terms using linear regression. We controlled for child age, sex, and interviewer at 9-11 y in minimally adjusted models and additional maternal, child, and environmental factors in fully adjusted models. We also evaluated effect modification by child sex.

RESULTS

In our study sample (n = 599), mean ± SD Hb was 113 ± 10 g/L at 6 mo and 112 ± 11 g/L at 18 mo. In minimally adjusted models, we found a significant quadratic relationship between 6 mo Hb and general intellectual ability (p=0.004) and arithmetic score (p=0.002), as well as between 18 mo Hb and general intellectual ability (p=0.022), in which lower outcome scores were apparent at both low and high Hb concentrations. We also found positive linear relationships between 18 mo Hb and literacy (p=0.002), arithmetic (p=0.029), and procedural memory scores (p=0.001). In fully adjusted models, these associations were no longer significant. There was no significant effect modification by sex in any of the models.

CONCLUSIONS

Associations between Hb at 6 and 18 mo and cognitive outcomes at 9-11 y may be non-linear and are strongly influenced by individual and household characteristics. Further investigation into the complex relationship between early-life nutrition and child development is warranted.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 67 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

OAP67_01

EVALUATION OF THE SUSTAINABILITY AND EFFICIENCY OF THE COMMUNITY INTERVENTION PROGRAM ALIMAIDANTS FOR FAMILY CAREGIVERS OF THE ELDERLY IN THE NORTH OF FRANCE

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BACKGROUND AND OBJECTIVES

The role of caregivers in elderly care significantly impacts their mental and physical well-being, often leading to adverse health outcomes.In addition, there is a lack of data on understanding their lifestyle including dietary behaviors. The objective of the 4-year community program AlimAidants is to improve the health and well-being of caregivers through their diet.Health promotion topics have been identified based on a first needs assessment in 2022 and implemented in the ongoing intervention phase(2023-2025).This study aims to evaluate the overall sustainability and efficiency of the program.

METHODS

6 topics related to caregivers' and elderlys' health issues have been identified. Data-based interventions were designed as multiple formats including digital tools,nutrition education workshops and conferences.A semi-quantitative self-administered questionnaire was disseminated as paper and web version.Data were analyzed using descriptive statistics with IBM SPSS(30.0.0.0).Several indicators for efficiency evaluation were determined such as the number of participants as well as the retention rate.

RESULTS

Nutrition education workshops were conducted between 2023 and 2024:12 interventions with 43 participants were conducted in 2023 while 15 were organized in 2024 with 57 participants.The participation was fluctuating but with a 30% increase in the retention rate. 10 web-based conferences were animated with a satisfaction rate of 80%.15 partners were engaged.The number of subscribers on social media platforms has reached n=411.In total,11 public events were animated.2 conferences were organized.Assessment confirmed that mental and physical health were impacted.Caregivers (n=31) were mostly woman (77.4%) and were on average 69 years old.Briefly, 61.3% provided daily support, performing on average 4.5 tasks(±7),impacting several health parameters: 35.5% perceived moral fatigue, 48.8% stress and anxiety and 41.9% physical fatigue. 48.8% of the caregivers considered to have a fluctuating physical health state and 38.7% a fluctuating mental health state.A total of 77.4% of caregivers give importance to the quality of their diet.

CONCLUSIONS

These RESULTS show good efficiency in participants but more fluctuating sustainability necessitating the need to digitalize participative approaches to target isolated and vulnerable caregivers

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

Claire Duga, Alexia Trottier, Carine Delayre-Orthez, Claude-Narcisse Niamba, Véronique Vincent, et al.. Assessing Prevention Priorities in French Family Caregivers of the Elderly at Risk of Loss of Autonomy: RESULTS from a Community Intervention on Diet. European Nutrition Conference, MDPI, pp.371, 2024, ⟨10.3390/proceedings2023091371⟩. ⟨hal-04542584⟩

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OAP67_03

ACCELERATING THE REDUCTION IN CHILDHOOD UNDERNUTRITION IN A LOWER-MIDDLE-INCOME COUNTRY SETTING: EVIDENCE FROM A 'BEST-IN-CLASS' PUBLIC-PRIVATE PARTNERSHIP, STATE OF MADHYA PRADESH, INDIA

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BACKGROUND AND OBJECTIVES

Undernutrition remains a critical issue in India, with 1 in 3 children under 5 stunted and underweight (National Family Health Survey-5, 2019-20). The COVID-19 pandemic worsened this crisis, particularly in vulnerable communities. Integrated approaches addressing the multifaceted factors of child health are vital for rapid and sustainable improvement. The program, implemented as a public-private partnership, aimed to reduce the prevalence of undernutrition among children under 5 years in a high-priority geographical region in Madhya Pradesh, India.

METHODS

The program was implemented over 18 months in collaboration with the Government, targeting children aged 0–6 years. Approximately 10,000 children were covered. The program combined nutritional supplementation with caregiver, provider and broad-based community interventions to holistically address child growth and development. Key differentiators included, a) introduction of, for the first time ever, age-appropriate, nutritious hot cooked meals to children aged 6 months–3 years b) home-based inter-personal communication with caregivers on IYCF practices; c) broad based community engagement for sustaining child feeding practices and community action. Frontline workers were trained to enhance nutrition counselling and growth monitoring for effective service delivery. Focused home visits were conducted to support caregivers of young and moderately malnourished children, as well as follow-ups for SAM children post-discharge from nutrition rehabilitation centers. Community engagement initiatives involved setting-up women self-help group managed community kitchens, recipe demonstrations for promoting favourable child feeding practices. The program developed a robust real-time monitoring mechanism and the rich data collected was used to develop an AI tool to predict occurrence of undernutrition. External evaluations were conducted at baseline and endline.

RESULTS

Difference-in-Difference analysis showed a 10% decline (signifying a 21.1% reduction) in prevalence of stunting and an 8.4 % decline (signifying a 27.2% reduction) in underweight prevalence, among children under 5 years ($p<0.01$). The findings also indicated enhanced caregiver knowledge and systemic-level improvements in the intervention area.

CONCLUSIONS

Innovative approaches providing supplementary nutrition at an early age, engaging caregivers to influence feeding practices, & fostering community involvement have potential to accelerate reduction in childhood undernutrition in lower-middle-income countries.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP67_05

AN INDEX OF PROTEIN PRICE AND QUALITY: 2009 TO 2023

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BACKGROUND AND OBJECTIVES

Food protein price changes over time. The challenge is to balance affordability, food preferences, quality of protein, and availability. The study was conducted periodically in 2009, 2015 and 2023 in (redacted for review). The objectives were to determine protein intake, develop a Protein Source Index (PSI) which incorporated price and quality, and finally determine relative costs of various food preferences.

METHODS

This serial cross-sectional study was completed by 1,120 adult respondents who were recruited using convenient sampling. Interviewer administered semi-quantitative food frequency questionnaire (SQ-FFQ) was used. Price of food items were surveyed from supermarkets, wet markets, and for 2023, online offerings. Protein content per 100g edible portion was determined from the national food composition database. Protein quality was determined using the FAO Amino Acid Content of Foods and Biological Data on Proteins. These elements were ranked respectively and then combined to derive one PSI for each study year.

RESULTS

Protein intake increased over the years. Mean intake was 37.2 g/day for men and 34.6 g/day for women in 2009. Median intake was 64.7 g/day for men and 49.3 g/day for women in 2015, and 107.9 g/day for men and 90.3 g/day for women in 2023. Protein intake increased from below recommended intake levels to over recommended levels, which were 51 – 62 g/day depending on sex and age. The PSI featured at least five marine fish in the top ten listing in the three study years because the study location was near the sea. Sun dried anchovies and soybeans appeared in all three PSIs. However, chicken egg only appeared in the 2009 PSI because it increased from USD0.21/100g edible portion in 2009 to USD0.29 in 2023. By 2023, the protein cost per day of an omnivorous diet was USD 5.19, lacto-ovo-vegetarian diet was USD 3.76, and vegan diet was USD 2.86.

CONCLUSIONS

Marine fish will continue to feature among the cheaper proteins in the top ten listing of the PSI as they are locally sourced. Plant protein will continue to be in the minority in the top ten listing as the country imports most of them. This calls for changes in food policies to maintain fish stock sustainability, reduce carbon footprint of protein, and maintain price stability from foreign exchange fluctuations for imports.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP67_06

THE IMPACT OF FRONT-OF-PACKAGE NUTRITION LABELING ON CRITICAL NUTRIENT CONSUMPTION IN LATIN AMERICA AND THE CARIBBEAN: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

Front-of-package nutrition labeling (FOPNL) has emerged as a prominent public health strategy widely adopted in Latin America and the Caribbean (LAC) to reduce the consumption of critical nutrients associated with non-communicable diseases (NCDs), such as sugars, sodium, and saturated fats. Evidence suggests that FOPNL is associated with the reduction in the consumption of foods rich in critical nutrients, by discouraging the consumption of such products. This study aims to evaluate and synthesize the available evidence on the impact of FOPNL on the consumption of critical nutrients in LAC.

METHODS

A systematic review was conducted, with searches in five databases (PubMed, Scopus, Web of Science, Lilacs, and FSTA) for publications in English, Spanish, and Portuguese, covering the period from January 1, 2014, to October 15, 2024. Studies included in this review assessed the impact of FOPNL on critical nutrient consumption in LAC countries. The eligibility criteria were studies conducted in countries with the policy implemented with robust designs such as interrupted time series, controlled before-and-after studies, prospective cohorts, and observational studies. Extracted data were synthesized narratively, focusing on the reported impacts on critical nutrient consumption. This review followed PRISMA guidelines and is registered in PROSPERO (CRD42024605903).

RESULTS

Eight studies on the impact of FOPNL in LAC were identified: seven conducted in Chile and one in Mexico. The studies were grouped into two categories: those assessing the impact of FOPNL on product composition (n=4) and those assessing its impact on population consumption (n=4). The presence of FOPNL effectively reduced both the critical nutrient content in products and population consumption. This reduction was even more significant in school settings, involving children and adolescents.

CONCLUSIONS

The RESULTS consistently demonstrated that FOPNL positively impacts the reduction of critical nutrients. It is important to emphasize the need for more studies investigating this outcome. Methodological and contextual differences complement the evidence, providing a comprehensive overview of the effectiveness of this public policy in two countries. These findings underscore the importance of FOPNL as an effective strategy to mitigate excessive consumption of critical nutrients and reduce the prevalence of chronic diseases.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP67_07

MEASURING COVERAGE OF LARGE-SCALE FOOD FORTIFICATION AT THE HOUSEHOLD LEVEL: LIMITATIONS AND OPPORTUNITIES

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BACKGROUND AND OBJECTIVES

Large-scale food fortification (LSFF) is a cost-effective approach used in over 100 countries to address widespread micronutrient deficiencies. Measuring LSFF coverage through household surveys is critical for ensuring vulnerable individuals are being reached, but challenging as fortified foods are often undetectable by design. The overarching objective of this work was to improve LSFF coverage measurement in household surveys and inform a standard set of valid LSFF coverage indicators for global use.

METHODS

In two districts in Ethiopia and in Bangladesh, we conducted market assessments (n=56 markets/shops), and interviews with women (n=84). Market assessments involved fortified food vehicle (oil, wheat flour, salt, and rice) type and brand checklists and rapid vendor interviews. Questions selected from the Global Alliance for Nutrition's (GAIN) fortification assessment toolkit (FACT) were modified through consultations with GAIN for testing. Interviews with women focused on comprehension, retrieval, judgment, and response errors.

RESULTS

Market landscaping revealed large variation in types, brands, packaging and labeling of food vehicles, with nearly all oil and salt being labeled as fortified but not wheat flour or rice. Interviews revealed that women had limited knowledge about fortified foods, and most women could not distinguish between different types of markets/shops when asked where they last purchased the food vehicles. The concept of "brand" was not well understood, and women often could not remember the brand they last purchased. Modifications to the FACT tool were made to improve validity and reduce reporting error and a set of revised coverage indicators was proposed. The revised tool is being implemented in a One Nutrition Coverage Survey in Bangladesh (n=3280 households; data collection ending in March 2025) to contribute to learning on co-coverage of LSFF with other interventions across nutrition, health, and social protection sectors.

CONCLUSIONS

Measuring LSFF coverage at the household level is inherently challenging, but essential to understand if programs are reaching the right individuals. Acknowledging the limitations of this approach, correct phrasing of key concepts as understood by respondents, and identifying key points for training of enumerators will enhance data quality and validity. A common set of indicators should be used across countries when reporting and tracking LSFF coverage.

CONFLICTS OF INTERESTS
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OAP67_08

MAPPING POWER AND INFLUENCE IN MATERNAL AND CHILD HEALTH AND NUTRITION: A NET-MAP STUDY IN MEXICO

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BACKGROUND AND OBJECTIVES

Maternal and child health care involves comprehensive, high-quality support for the mother-child dyad, from prenatal care to early postpartum, and continuous monitoring of growth and development during the first five years of life (1,2). In Mexico, maternal and child malnutrition remains a critical public health issue, with slow progress toward the 2030 Global Nutrition Targets—particularly in reducing stunting, low birth weight, and anemia, while improving exclusive breastfeeding rates—due to limited action, inadequate funding, low prioritization by key decision-makers, and ineffective coordination among stakeholders(3,4). This study aimed to identify key stakeholders involved in decision-making processes for maternal and child malnutrition prevention in Mexico, analyze their roles and institutional affiliations, and assess their influence and power in addressing these challenges.

METHODS

The Net-Map actor mapping methodology, developed by the International Food Policy Research Institute(5) and the World Bank (6), was employed. The mapping process involved conducting individual interviews with key informants engaged in maternal and child health and nutrition in Mexico. Interviews were conducted in two phases: 19 participants in the first stage and 15 in the second. Gephi 0.10.1 software was used to generate the network map.

RESULTS

The study identified 77 stakeholders involved in Mexico's maternal and child health and nutrition. However, decision-making authority is predominantly concentrated within government bodies and supranational organizations, with minimal involvement from organized civil society groups. Implementation is the most executed action, ranking first for the government but lower for other actors. Communication follows closely, while Training and Management rank fourth. In contrast, Financing, Advocacy, and Patient Care show limited activity, with specific actors leading each area.

CONCLUSIONS

Enhancing collaboration among the key stakeholders identified in this study is crucial to unlocking the full potential of both current and future initiatives aimed at improving maternal and child health and nutrition outcomes in Mexico. By fostering stronger partnerships, aligning strategies, and addressing systemic barriers, we can significantly amplify the impact of interventions, ultimately driving lasting change and ensuring better health and nutrition for vulnerable populations across the country.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP67_09

THE HIGHER DENSITY OF UNHEALTHY FOOD STORES AROUND SCHOOLS IS ASSOCIATED WITH INCREASED CONSUMPTION OF SUGAR-SWEETENED BEVERAGES AMONG BRAZILIAN CHILDREN

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BACKGROUND AND OBJECTIVES

The rising consumption of sugar-sweetened beverages among children contributes to obesity and its comorbidities. In this context, the food environment around schools influences dietary choices, particularly unhealthy foods. We aimed to evaluate the association between the density of unhealthy food stores around schools and the consumption of sugar-sweetened beverages among Brazilian children.

METHODS

Cross-sectional study with children aged 8 and 9 years enrolled in 24 urban schools in Viçosa, Minas Gerais, Brazil. Sugar-sweetened beverages (soft drinks, packaged juices, and powdered juices) were assessed using three 24-hour dietary recalls. The total caloric contribution of these beverages (%) was categorized based on the 50th percentile (3.8% of total energy intake). Unhealthy food stores were defined as those where more than 50% of the available products for sale were ultra-processed foods (CAISAN, 2018). The density of unhealthy food stores per 1,000 inhabitants was calculated within 400-meter network buffers around the schools and categorized according to the 50th percentile (43.2 stores per 1,000 inhabitants). Generalized estimating equations logistic regression analysis was performed, estimating odds ratio (OR) with 95% CI, adjusted for sex, age, and per capita income, with α=0.05. This study was approved by the Human Research Ethics Committee.

RESULTS

A total of 378 children were assessed (51.3% female; age 8.5 ± 0.5 years), of whom 70.9% (n=268) were students at public schools. The most frequent types of unhealthy food stores around schools were cafeterias (77.6%, n=207), followed by ice cream parlors (8.6%, n=23), mobile unhealthy food vendors (4.9%, n=13), and candy stores (3.7%, n=8). Children whose school surroundings had a higher density of unhealthy food stores had 67% higher odds of increased sugar-sweetened beverage consumption (adjusted OR: 1.67; 95% CI: 1.08; 2.58).

CONCLUSIONS

A higher density of unhealthy food stores around schools is associated with increased consumption of sugar-sweetened beverages among Brazilian children. Public health policies should consider regulating the food environment near schools to promote healthier food choices.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 05 - NON COMMUNICABLE DISEASES

OAP5_01

NUTRITIONAL INTERVENTIONS IN OVERWEIGHT WOMEN WITH POLYCYSTIC OVARIAN SYNDROME

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BACKGROUND AND OBJECTIVES

Polycystic ovarian syndrome (PCOS) is one of the most common metabolic and hormonal disorders in young women. Abdominal obesity and PCOS are associated with irregular menstrual cycles and reduced pregnancy rate. The aim of the study is to evaluate the impact of nutritional interventions and weight loss on the regulation of insulin resistance, menstrual cycles and achieved pregnancy rate in overweight women with PCOS.

METHODS

57 women age 18-45 with PCOS and BMI ≥25 kg/m2 were submitted to nutritional interventions including Mediterranean diet with low carbohydrate intake for 12 months. Their baseline characteristics (age, WHR, BMI, HOMA -IR, ovulatory cycle) were recorded. They had regular follow-up controls of anthropometric and laboratory parameters.

RESULTS

There was a statistically significant difference in HOMA-IR; WHR, BMI and ovulatory cycle between overweight women with PCOS that achieved weight loss of more than 10% compared to women who did not achieve weight loss (62.3 vs. 14.1%; $p<0.001$). The RESULTS of our analysis showed that overweight women with PCOS who had a weight loss of more than 10% during 12 months had a 65% greater likelihood of achieving pregnancy (adjusted OR = 1.65; CI:1.22, 2.08; $p<0.001$)

CONCLUSIONS

Nutritional interventions including Mediterranean and low-carbohydrate diet as a treatment for overweight women with PCOS can improve reproductive and metabolic function.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP5_02

ESTIMATED HEALTH AND ECONOMIC IMPACTS OF TAXATION ON UNHEALTHY PACKAGED FOODS IN THE PHILIPPINES

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BACKGROUND AND OBJECTIVES

In 2018, the Philippines implemented a tax on sweetened beverages to address diet-related morbidity and mortality. Building on its success, policymakers are exploring a tax on unhealthy packaged foods. This study aimed to estimate the health and economic impacts of a tax on packaged foods high in sugar or sodium, including reductions in disease burden, healthcare cost savings, revenue generation, and equity implications.

METHODS

Using a multiple-cohort proportional multi-state life table model, we estimated the impact of a 20% tax on packaged foods high in sugar or sodium on dietary intake, health outcomes, and economic metrics over 20 years. Data on dietary intake, food prices, and price elasticities from the 2018-2019 Expanded National Nutrition Survey were combined with food sales trends from Euromonitor to estimate the impact of taxes on sodium and sugar consumption, as well as the expected tax revenue. Data from the Global Burden of Disease Study and Philippines Health Insurance Corporation were used to translate the dietary impact into effects on incident events, prevalent cases, and deaths due to cardiovascular disease and type 2 diabetes, health-adjusted life years (HALYs), and healthcare costs related to the modelled diseases. Net costs included implementation costs, tax revenue, and healthcare cost savings, and cost-effectiveness was evaluated from both extended healthcare and government perspectives.

RESULTS

Over 20 years, the tax was estimated to avert ~9,000 deaths from cardiovascular disease and type 2 diabetes, prevent ~59,000 incident cardiovascular disease events, avoid ~18,000 new diabetes cases, generate ~594,000 health-adjusted life years (HALYs), and save an estimated PHP ~4.5 billion in related healthcare costs. From a government perspective, the intervention could be highly cost-saving, with a negative net cost of PHP ~630 billion, due to large tax revenues (i.e., PHP ~650 billion). From the extended healthcare perspective (i.e., excluding tax revenue), the intervention was still estimated to be highly cost-effective with an incremental cost of PHP ~14,000 per HALY gained. The least wealthy quintile could gain ~13% more HALYs than the wealthiest quintile.

CONCLUSIONS

A broad nutrient-based tax on unhealthy packaged foods in the Philippines could be a highly cost-effective and equitable strategy to reduce the burden of diet-related non-communicable diseases. The intervention has the potential to save lives, generate significant revenue, and reduce health disparities across socioeconomic groups.

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OAP5_03

NUTRITION AND OSTEOCLAST ACTIVITY COULD BE INVOLVED IN LOWER BONE MINERAL DENSITY OBSERVED IN SOME PATIENTS WITH PHENYLKETONURIA, WHILE EX VIVO OSTEOCLASTOGENESIS IS UNALTERED IN THESE PATIENTS

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BACKGROUND AND OBJECTIVES

Phenylketonuria (PKU, MIM 261600) is a recessive inherited disorder resulting in severe mental retardation if left untreated. PKU can be detected via newborn screening and by restricting the phenylalanine (Phe) intake from the diet, mental retardation has successfully been reduced in these patients. However, non-neurological symptoms have been described. One of these is impaired bone health even in children and well-treated patients with PKU. Therefore, we analyzed bone mineral density (BMD) and osteoclasts (OC) from adult patients with PKU next to their eating patterns.

METHODS

18 adult patients with PKU (11 ♀; 35 ± 12 years) and 19 age- and sex-matched controls (10 ♀; 36 ± 11 years) participated in the study. Peripheral blood mononuclear cells were isolated via Ficoll method and incubated with differentiation factors for 14 days. Trap-positive, multinucleated cells (≥ 3 nuclei) were counted to quantify the OC formed, and the expression of selected OC genes was determined using qPCR. Nutrition was assessed using a food frequency questionnaire and the World Index for Sustainability & Health (WISH; scale: 0 - 130 points). For those affected with PKU, blood Phe concentrations of the last 5 years were taken from their medical records and the BMD was measured using dual X-ray absorptiometry (DXA) at the hip (hBMD).

RESULTS

hBMD T-Score was significantly below 0 in patients with PKU (-0.7 ± 1.0, $p = 0.02$) and patients with hBMD below -1 reached a significantly lower WISH than patients with higher hBMD. Neither WISH or OC count nor the gene expression of the OC genes differed between the patients and controls. Furthermore, there was no correlation between the OC markers, OC count and BMD and the blood Phe concentrations in the patients' during the last 5 years. OC from patients with hBMD T-Score below -1 tended to have higher relative cathepsin K (CTSK) mRNA expression (0.9 [0.6 - 3.4]) than patients with normal hBMD (0.2 [0.2 - 0.8]; $p = 0.055$), and the T-Score in the hip correlated significantly negatively with CTSK expression ($r = -0.52$; $p = 0.04$).

CONCLUSIONS

The reduced BMD described in patients with PKU cannot be attributed solely to a greater number or activity of OC. However, eating patterns and the slightly higher CTSK expression in patients with low BMD suggests that altered OC activity and diet may play a role.

CONFLICTS OF INTERESTS

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OAP5_04

ASSOCIATION BETWEEN ULTRA-PROCESSED FOODS CONSUMPTION DURING PREGNANCY AND BREAST DENSITY POST-PARTUM: THE CHILEAN MATERNAL AND INFANT NUTRITION COHORT STUDY II (CHIMICS-II)

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BACKGROUND AND OBJECTIVES

The consumption of ultra-processed foods (UPF) has been linked to higher risk of breast cancer (BC). Breast density (BD) is a well-established modifiable risk factor for BC. Pregnancy itself has been associated with an estimated 12% reduction in BD per birth. However, it remains unclear whether Ultra-processed foods (UPF) intake during pregnancy could modify BD, potentially affecting BC risk. This study assessed whether UPF consumption during pregnancy is associated with breast composition measures, specifically percent fibroglandular volume (%FGV) and absolute fibroglandular volume (AFGV).

METHODS

The Chilean Maternal and Infant Nutrition Cohort Study II (CHiMICs-II) is a longitudinal study of pregnant women (n= 1954) recruited from public healthcare centers of Chile. Participants were followed from their first prenatal visit to three months after lactation ended. Dietary intake during pregnancy was assessed via 24-hour dietary recalls (24HRs), with a mean of two recalls per participant. UPF was estimated based on NOVA-classification. In random sample of 344 participants, %FGV and AFGV were measured using dual-energy X-ray absorptiometry (DXA) at least three months post-lactation. Associations between UPF consumption (as % of total kcal and grams in quartiles) and BD measures were analyzed using simple and multiple linear regression models. Models were adjusted for age, pregestational body mass index, breastfeeding, parity, smoking, alcohol intake, education and total energy intake.

RESULTS

The mean age of participants was 29.9 years (SD = 6.0), with 37% having pregestational obesity. Average daily energy intake was 1,606 kcal (SD = 479.1), with 35% of calories and 22.4% of grams from UPF. DXA measurements were performed an average of 204 days post-lactation (SD = 137). The mean %FGV and AFGV were 36.0% (SD = 11.2) and 197.0 cm^3 (SD = 70.8), respectively. By UPF quartiles, mean %FGV and AFGV were 36.0% (SD = 11.1) and 217 cm^3 (SD = 107) in Q1 versus 36.0% (SD = 10.4) and 206 cm^3 (SD = 116) in Q4. No significant associations were observed between UPF quartiles and %FGV or AFGV (e.g., UPF kcal Q4 vs. Q1, adjusted β for %FGV: -2.1, 95% CI -5.0; 0.8).

CONCLUSIONS

Our findings indicate that UPF consumption during pregnancy was not associated with breast density measures (%FGV or AFGV) in Chilean mothers. Further studies are needed to evaluate the long-term implications of UPF intake during pregnancy on BC risk and other health outcomes.

CONFLICTS OF INTERESTS

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OAP5_06

EFFECTIVENESS OF A PEER-LED DIGITAL HEALTH LIFESTYLE INTERVENTION FOR LOW-INCOME COMMUNITY AT RISK FOR CARDIOVASCULAR DISEASES (MYCARDIO-PEER)

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BACKGROUND AND OBJECTIVES

Cardiovascular diseases (CVD) disproportionately affect low-income communities with limited access to preventive care. Peer-based interventions have shown promise in managing chronic diseases. However, their effectiveness in reducing the risk of CVD among low-income groups using digital health remains underexplored. This study aimed to evaluate the effectiveness of MYCardio-PEER, an 8-week peer-led digital health intervention for at-risk individuals in a low- and middle-income country.

METHODS

MYCardio-PEER was developed using five-step approach: 1) review of evidence; 2) development of behavioural change matrix; 3) creation of digital content and peer-led activities; 4) content validation; 5) feasibility and process evaluation. A quasi-experimental design was used to assess its effectiveness, where the intervention group (n=30) participated in the 8-week MYCardio-PEER program, and the control group (n=31) received standard lifestyle counselling. Changes in the Framingham General CVD Risk Score (FRS), CVD biomarkers, physical activity levels, and dietary intakes were assessed at Week 0 (baseline), Week 8 (post-intervention), and Week 20 (follow-up).

RESULTS

MYCardioPEER resulted in greater reductions in FRS ($F= 3.937$, $p<0.05$, $\eta2= 0.063$), energy intakes ($F= 8.807$, $p<0.001$, $\eta2= 0.130$), and processed foods intakes ($F= 3.248$, $p<0.05$, $\eta2= 0.052$) as compared to the control group. Additionally, participants in the intervention group had a significantly greater increase in dietary fibre intakes ($F= 11.126$, $p<0.001$, $\eta2= 0.159$).

CONCLUSIONS

MYCardio-PEER successfully improved diet and lifestyle behaviours, and reduced CVD risk scores in individuals from low-resource settings. These findings suggest that MYCardio-PEER offers a scalable solution to reduce CVD risk factors and improve health outcomes in underserved populations.

CONFLICTS OF INTERESTS

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OAP5_08

COMPARISON OF CONVENTIONAL ANTHROPOMETRY AND DUAL-ENERGY X-RAY ABSORPTIOMETRY (DEXA)-DERIVED MEASURES OF BODY COMPOSITION AND THEIR ASSOCIATIONS WITH GLYCATED HAEMOGLOBIN (HBA1C) IN A LARGE, MULTI-ETHNIC COHORT

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BACKGROUND AND OBJECTIVES

No large-scale studies have robustly examined body composition measures across multi-ethnic populations using Dual Energy X-ray Absorptiometry (DEXA) scans. Additionally, the relationship between body composition and glycated haemoglobin (HbA1c) in diverse populations remains understudied.

METHODS

DEXA scans were performed on 5,443 individuals from the Malaysian Cohort (36% Malay, 44% Chinese, and 20% Indian) between 2020 and 2023, mean age was 58.1 (SD 7.8) years. Sex-specific linear regression models compared conventional anthropometry and DEXA-derived measures (total fat as a % of total mass, and regional fat as a % of total fat) across ethnicities. All anthropometric and DEXA-derived measures were standardised (mean = 0, standard deviation = 1) to facilitate the comparison of effect sizes across measures. After excluding participants with diagnosed diabetes, multivariable linear regression models compared associations of body composition with HbA1c across ethnicities.

RESULTS

Chinese participants consistently had the lowest body composition measures compared to Malay and Indian participants. At every given level of BMI, Indian participants had a higher %body fat than Chinese and Malay participants (approximately 2% higher in men, and 6% higher in women). Chinese participants had similar associations of anthropometric and DEXA-derived measures with HbA1c, but in Indian participants, DEXA measures had stronger associations with HbA1c than anthropometric measures. For example, in Indian women, a 1-SD higher waist circumference was associated with a 0.19 unit (95% CI: 0.08 to 0.31) increase in HbA1c, whereas a 1-SD higher %visceral fat was associated with a 0.29 unit (95% CI: 0.18 to 0.41) increase. Notably, no anthropometric measures were inversely associated with HbA1c, whereas DEXA-derived measures such as %gynoid fat, %leg fat and %lean body mass showed inverse associations.

CONCLUSIONS

There were distinct patterns of differences in DEXA-derived body composition across ethnicities that were not captured by conventional anthropometry. Indian participants generally had higher fat mass compared to their Malay and Chinese counterparts across BMI levels, with this difference more prominent among women. Compared to anthropometry, DEXA-derived measures showed stronger associations with HbA1c among Indian participants.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 13 - NON COMMUNICABLE DISEASES

OAP13_01

GLYCAEMIC LOAD, GLYCAEMIC INDEX, AND SENSORY ASSESSMENT OF TRADITIONALLY PREPARED AND INNOVATIVE BARLEY-BASED FOOD PRODUCTS

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BACKGROUND AND OBJECTIVES

Non-communicable diseases (NCDs) like cardiovascular disorders, Diabetes Mellitus, and malignancy are increasingly prevalent in developing nations, driven by a shift from traditional foods to processed meals. A diet low in glycemic index (GI) and glycemic load (GL) can help prevent and manage NCDs. Barley, recognized as a functional food for its high dietary fiber content and benefits in blood glucose regulation, remains underutilized in everyday diets despite its low GI. This study aims to develop and standardize two barley-based, easy-to-prepare recipes as alternatives to Indian traditional dishes like curd rice, while assessing their GI and GL to promote healthier dietary choices.

METHODS

Barley curd (BC) and barley porridge (BP) were developed using locally available ingredients as alternatives to curd rice and rice porridge. The recipes were dried, powdered, and analyzed for proximate composition and available carbohydrate content using AOAC METHODS. Sensory evaluation was done by 50 volunteers to assess the palatability of the developed products along with their standard counterparts. The GI testing was done in 20 volunteers once they satisfied the inclusion criteria. Anthropometric data were recorded using standard protocols. Glucose levels were measured using a glucometer at fasting (-15, 0) and post-ingestion until 120 minutes (15, 30, 60, 90, 120). The GI testing involved consuming reference glucose (25g available carbohydrate) and test foods (barley curd and porridge) with a 2-day washout between sessions, ensuring accurate blood glucose profiling.

RESULTS

The proximate analysis showed that barley-based foods had higher total and insoluble dietary fiber than rice-based counterparts, with comparable other parameters. Sensory evaluations ranked the products' acceptability as: Curd Rice > Barley Curd > Barley Beverage > Rice Beverage. Barley beverage was superior to rice beverage in taste, texture, and overall acceptability. Both barley curd and barley beverage were low-GI foods (<55), with GI values of 44.5 ± 3.46 and 39.7 ± 2.88, respectively. Their glycemic loads (GL) were also low (<10), at 3.9 for barley curd and 4.4 for barley beverage, indicating their suitability for low-GI diets.

CONCLUSIONS

The developed recipes exhibited superior fiber content and were well-accepted in sensory evaluations which demonstrates the potential of barley-based foods as viable alternatives to traditional Indian dishes. These barley products may offer a practical dietary shift to help manage and prevent non-communicable diseases.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP13_02

EFFICACY OF ZINC FORTIFIED AND FERMENTED WHEAT FLOUR (EZAFFAW): A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Zinc deficiency poses significant health risks, particularly in low-income settings. This RCT aims to evaluate the impact of agronomically zinc biofortified (fermented and non-fermented) and post-harvest wheat flour flatbread on zinc status and metabolic health in adolescents and adult women in rural Pakistan.

METHODS

A four-arm triple-blind randomized controlled trial was conducted in a rural district of Pakistan. Participants (adolescents aged 10–19 and adult women aged 20–40) were assigned to receive fermented or unfermented high zinc agronomically biofortified wheat flour flatbread, post-harvest zinc-fortified wheat flour flatbread, or low zinc conventional whole wheatflour flatbread. teh outcomes included serum zinc concentration, zinc deficiency, Body Mass Index (BMI, HbA1C, HOMA-IR and lipid profile. The meal was served once a day, six days a week for six months. This trial adhered to CONSORT guidelines for randomized trials, with primary analysis on an intention-to-treat basis The trial is registered with number NCT06092515.

RESULTS

A total of 1044 participants were randomized to four study arms. The baseline characteristics of the participants of the four study arms were comparable. At endline all the groups showed improvement from their respective baseline levels for serum zinc, anthropometry and metabolic markers. The multivariable analysis suggests statistically significant differences among the four groups in HbA1c, fasting blood glucose and triglyceride levels, while there was no significant difference for serum zinc or BMI.

CONCLUSIONS

The RESULTS highligh the role of agronomically zinc biofortified wheat flour in improving zinc status and metabolic health. Findings may inform public health strategies to combat zinc deficiency in resource-limited settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP13_03

ASSOCIATION OF LIFESTYLE PATTERNS WITH THE INCIDENCE OF MAJOR CHRONIC DISEASES: EVIDENCE FROM THE PROSPECTIVE LIFELINES STUDY

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BACKGROUND AND OBJECTIVES

Individual lifestyle risk factors negatively impact the incidence of major non-communicable diseases (NCDs) – type 2 diabetes (T2D), cancer, respiratory diseases (RD), and cardiovascular diseases (CVDs). However, the combined effects of lifestyle factors, as they interact in real-life scenarios, on NCDs remain unclear. We previously identified five common lifestyle patterns based on six domains of lifestyle factors (nutrition, physical activity, stress, restorative sleep, social connection, and substance use) which we termed 'Healthy but physically inactive', 'Unhealthy but no substance use', 'Healthy in a balanced way', 'Unhealthy but light drinking and never smoked' and 'Unhealthy' lifestyle patterns. We aimed to explore the relationships between these lifestyle patterns and the four leading NCDs.

METHODS

We used data from the Lifelines cohort, including adults aged ≥18 years free of the relevant diseases at baseline. Outcomes were based on questionnaires and clinical records. Competing risk models were used to estimate associations between lifestyle patterns and disease incidences while treating death as a competing event, adjusted for socio-demographics, and taking the 'Unhealthy' pattern as the reference group.

RESULTS

The overall mean age was 45 (SD 13) years and 59% were females. Among 114 919 (T2D), 131 248 (cancer), 91 711 (RD), and 77 645 (CVDs) participants from four sub-cohorts, 3114, 4685, 4133, and 2850 incident cases occurred over 17.4 years, respectively. For T2D, the 'Healthy but physically inactive', 'Healthy in a balanced way', and 'Unhealthy but light drinking and never smoked' patterns were significantly protective (sub-distribution hazard ratio (SHR) equaling 0.86 (95%CI 0.75-0.99), 0.62 (95%CI 0.55-0.69), and 0.84 (95%CI 0.75-0.93), respectively), while the 'Unhealthy but no substance use' pattern increased risk (SHR 1.32, 95% CI 1.15-1.52). For cancer, the 'Healthy in a balanced way' (SHR 0.89, 95% CI 0.81–0.99) and 'Unhealthy but light drinking and never smoked' (SHR 0.86, 95%CI 0.77-0.95) patterns were protective. Incidence risk of RD was lower within the 'Healthy but physically inactive' (SHR 0.84, 95%CI 0.74-0.96) and 'Healthy in a balanced way' (SHR 0.84, 95%CI 0.75-0.93) patterns. No significant associations were observed for CVDs. When stratified by sex, significant protective effects between lifestyle patterns and cancer incidence persisted in females but were not observed in males.

CONCLUSIONS

Diverse relationships between integrated lifestyle patterns with NCDs highlight the importance of tailored, sex-specific lifestyle pattern interventions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP13_04

Public support and perspectives on the taxation of sugar-sweetened beverages: RESULTS from a nationally representative pre-implementation survey

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BACKGROUND AND OBJECTIVES

The global increase in obesity and diet-related non-communicable diseases (NCDs) is linked to the increasing consumption of sugar-sweetened beverages (SSBs). Fiscal measures such as a tax on SSBs are considered an effective public health strategy to improve diets and reduce NCDs. This study investigates the awareness of the health risks associated with the consumption of SSBs and public support for a proposed SSB tax before its implementation.

METHODS

The study was cross-sectional in design and involved a total of 7,794 adults aged 18 years and above. Data was collected through survey METHODS deployed in three phases, first via a short message service survey, with panel data of about 140,000 residents' telephone numbers. Second, through a social media survey to enhance coverage and help reach different populations. And third, through field data collection with support from trained enumerators. Stratified sampling techniques were used to ensure that the sample was nationally representative. The data was analyzed descriptively using Stata.

RESULTS

About 70% of the participants were concerned about obesity and NCDs, especially among children. A majority (90.5%) of respondents reported being aware that "too much" sugar consumption is linked to several health problems. Specifically, 77.7% of the respondents were aware that SSBs are a major contributor to the obesity problem. Furthermore, 74.8% indicated it is important for the Government to take steps that discourage the consumption of SSBs. Two out of three respondents (67.7%) indicated they would support the Government's efforts to impose a tax on SSBs. Support for a tax increased to 77.4% contingent on the tax revenue being used to support public health interventions. Support for a tax was high among those with higher education and those aware that SSBs contribute to obesity. Those who consumed SSBs most frequently expressed less (38.6%) support for the implementation of a tax on SSB.

CONCLUSIONS

The findings show that participants are aware that SSBs are a major contributor to the obesity problem and support the implementation of an SSB tax as a measure to improve diets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP13_06

DIETARY SUPPLEMENT USE AND LIFE EXPECTANCY AFTER BREAST CANCER – THE DANISH DIET, CANCER AND HEALTH COHORT

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BACKGROUND AND OBJECTIVES

Dietary supplement use is widespread among women with breast cancer, but the evidence of the possible health benefits or harms remains limited.

The objective was to investigate the association between use of dietary supplements and life expectancy after breast cancer.

METHODS

Data from the Danish Diet, Cancer and Health cohort was used. Repeated measures of dietary supplements intake were available. We followed 1948 incident cases of breast cancer from diagnosis until migration, death, end-of-follow-up or 20 years. 723 died during this time; 450 due to breast cancer. Pre-diagnostic dietary supplements use and difference in 20-year life expectancy and life years lost due to breast cancer and other causes, respectively were estimated using pseudo-observations and regression models adjusted for potential confounders.

RESULTS

No association was found for any use of dietary supplements, however use of solely multivitamins was associated with longer life expectancy after breast cancer (0.98 years, 95% CI: 0.01–1.95), particularly fewer years lost due to breast cancer (-1.06 years, -1.85–-0.28).

High supplementary intakes of vitamins A, B12 and D, iron and magnesium tended to be associated with poorer life expectancy. Indications of poorer life expectancy were found for antioxidant supplements among those that received chemotherapy.

CONCLUSIONS

Multivitamins alone may be beneficial for women with breast cancer, whereas excess use may not. High intakes of certain micronutrients from dietary supplements may impair survival, especially antioxidant supplements use during chemotherapy.

Women with breast cancer should pay caution when using dietary supplements and limit use, if any, to multivitamins only.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP13_07

IS INTESTINAL CD36 INVOLVED IN THE DEVELOPMENT OF WESTERN DIET-INDUCED OBESITY?

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BACKGROUND AND OBJECTIVES

Obesity is linked to insulin resistance, hyperglycemia, hypertriglyceridemia, and endotoxemia. The intestine plays a key role in lipid absorption, permeability, and incretin-mediated insulin secretion. CD36, an ubiquitous membrane receptor for long-chain fatty acids expressed in intestinal epithelial cells, is involved in chylomicron formation, permeability regulation (1), and peptide secretion (2). CD36 polymorphisms in humans are associated with a higher risk of metabolic syndrome (3). This study aimed to assess the contribution of intestinal CD36 in obesity development under a Western Diet (WD).

METHODS

Male and female mice deficient in CD36 in the intestinal epithelial cells (*Cd36*-Ent(-/-)) and their control littermates (CTL; *Cd36*-Ent(+/+)) were fed a WD or control diet (CD) (ssniff) for 15 weeks (n=17-20/group). Body mass, body composition and food intake were monitored. Triglyceridemia and endotoxemia were measured in fasting and postprandial states (4 hours after oil gavage). Intestinal triglyceride (TG) secretion was assessed following lipoprotein lipase inhibitor injection before oil gavage. Glucose and insulin tolerance tests (OGTT, ITT) were also performed. Mice were sacrificed in fasting (n=8) or postprandial states (n=8). Statistical analyses (ANOVA, Student's *t*-test, non-parametric tests) compared WD and CD effects within genotypes using GraphPad Prism.

RESULTS

The WD significantly increased body mass and fat mass in both mouse genotypes and genders. However, deletion of intestinal CD36 did not affect body mass nor diet efficiency but resulted in a greater fat mass gain in the WD-fed *Cd36*-Ent(-/-) mice of both genders compared to CD-fed *Cd36*-Ent(-/-) mice. Intestinal TG secretion decreased on the WD in both genotypes but remained significantly higher in *Cd36*-Ent(-/-) male mice than in CTL mice (p=0.03), without affecting postprandial triglyceridemia. After gavage, endotoxemia was elevated only in WD-fed *Cd36*-Ent(-/-) males (p=0.05). Nevertheless, WD-fed *Cd36*-Ent(-/-) mice showed enhanced insulin sensitivity (p=0.0003) and no glucose intolerance compared to CTL males (p=0.006).

CONCLUSIONS

Intestinal epithelial CD36 limits WD-induced fat mass gain, postprandial TG secretion and endotoxemia. However, it promotes glucose intolerance and insulin resistance under a WD. Further investigations are required to understand these observations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP13_08

PRIORITIZING BEHAVIOURS TO ADDRESS THE TRIPLE BURDEN OF MALNUTRITION IN ADOLESCENTS: EVIDENCE FROM CAMEROON

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BACKGROUND AND OBJECTIVES

Malnutrition is a major public health problem affecting adolescents. Unhealthy dietary intake and a sedentary lifestyle contribute significantly to the rising burden. Interventions that promote few and well-contextualized healthy behaviors are effective in preventing malnutrition. This study aimed to use Kneebone's Impact-Likelihood approach to identify behaviors on which to focus a social and behavior change program for adolescents in Cameroon.

METHODS

A narrative review of published literature on malnutrition was used to identify an initial list of behavioral factors associated with malnutrition in adolescents. An online survey with 12 experts helped to generate 26 context-specific behaviors. Twenty-four experts attributed impact scores to each identified behavior. A survey with 842 adolescents was conducted to generate the participation rates and likelihood of adoption scores of each identified behavior. These scores were converted into Z scores and mapped onto a 04-quadrant graph to generate an impact-likelihood matrix.

RESULTS

Five (05) dietary behaviors: avoiding unhealthy snacking, eating 5 portions of fruits and vegetables, limiting the intake of fast foods, eating calcium-rich foods, taking breakfast every morning; and Two (02) health-related behaviors: taking iron supplements when menstruating for girls, taking dewormers twice per year were identified as behaviors with the highest impact on preventing malnutrition by experts and are likely to be easily adopted according to adolescents.

CONCLUSIONS

This study identified 07 behaviors that should inform the development of context-specific and effective social and behavior change programs for adolescents in Cameroon. By synthesizing existing literature and validating identified behaviors through expert consultation, this research provides a robust foundation for designing targeted interventions in Cameroon

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 21 - NON COMMUNICABLE DISEASES

OAP21_01

LONGER BREASTFEEDING DURATION REDUCES THE RISK OF SUBCLINICAL CARDIOVASCULAR DISEASE

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BACKGROUND AND OBJECTIVES

Cardiovascular disease (CVD) is the number one cause of death among women worldwide. While parity increases the risk, breastfeeding is a suggested protector against CVD. Coronary artery calcification score (CACS) is a sensitive predictor for future CVD. However, previous literature on the relationship between breastfeeding and CACS is limited. We therefore aimed to determine the impact of breastfeeding duration on the subclinical CVD risk marker CACS.

METHODS

Parous women aged 50-64 years, taking part in the national cohort SCAPIS (Swedish CArdioPulmonary Bioimage study) who responded to questions on exclusive and partial breastfeeding, and who underwent a coronary computed tomography angiography (CCTA) were included in the current analysis. The calcium content of each coronary artery was determined using CCTA and scored into a total CACS according to the Agatston method. For each woman, the average duration of exclusive and any breastfeeding (exclusive plus partial) per child was calculated. The odds ratio (OR) and 95% confidence interval (CI) of calcification (CACS >0), as compared to no calcification (CACS 0), were calculated using multivariable logistic regression. Confounders were based on a priory knowledge.

RESULTS

In our sample including 957 women, CACS ranged from 0 to 2208 with 29.5 % having a CACS of >0. Among women with a CACS > 0, the median CACS was 18 (IQR: 5.0–60.3). The median duration of exclusive breastfeeding per child was 4.8 months (IQR: 3.5–5.7), and for any breastfeeding it was 8.3 months (IQR: 5.5–12.7). After adjustments for age at study inclusion, education (≤12 years vs. >12 years), smoking (ever vs. never), body mass index (BMI) before first pregnancy and number of births, duration of any breastfeeding per child significantly decreased the likelihood of CACS >0 by 3% (0.97 (0.93;1.00, p=0.039)), while duration of exclusive breastfeeding did not significantly impact CACS (0.98 (0.93;1.04). Further adjustment for family disease history (diabetes, myocardial infarction, and stroke) and weight change from before the first pregnancy until inclusion yielded similar RESULTS. When further adjusting for CVD risk factors in midlife (fasting glucose, HDL cholesterol, total cholesterol, and systolic blood pressure) RESULTS for any breastfeeding were attenuated to non- significance (0.97 (0.93;1.00, p=0.052)) and RESULTS for exclusive breastfeeding remained non-significant.

CONCLUSIONS

Subclinical CVD risk in parous women may be reduced by longer breastfeeding. However, these findings were not independent of CVD risk profile in midlife.

CONFLICTS OF INTERESTS

Stefan Söderberg has received compensation for consultancy or speaking for J&J and Merck, outside the present work

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OAP21_02

THE EFFECT OF DIFFERENT FAT SOURCES ON POSTPRANDIAL INFLAMMATION: A RANDOMIZED DOUBLE-BLIND STUDY

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BACKGROUND AND OBJECTIVES

Low-grade inflammation is a risk factor for chronic diseases such as type 2 diabetes and cardiovascular disease. Consuming a high-fat meal can induce an acute inflammatory response, however the effect of different fat sources on postprandial inflammation is less understood. Therefore, we investigated whether different sources of saturated fatty acids (SFA) and polyunsaturated fatty acids (PUFA) have differential effects on postprandial inflammation.

METHODS

In a double-blind randomized, two site, 4-way crossover design, 18 healthy participants consumed isocaloric brownies (706 kcal) with different fat sources (butter, coconut oil, flaxseed oil, or corn oil) for breakfast. Blood samples were collected in the fasting state and at 2-hour intervals up to 6 hours post-ingestion. Inflammation markers were analyzed by multiplex immunoassay (Target 96, Inflammation panel, Olink Proteomics, analyzed by SciLifeLab, Uppsala, Sweden). In addition Glycoprotein Acetyls (GlycA) was analyzed by Nuclear Magnetic Resonance (analyzed by Nightingale Health). Data analyses were conducted in two stages. First, postprandial changes of 93 inflammation biomarkers between baseline (0 h) and up to 6 h post-ingestion were analyzed by linear mixed models. Each biomarker was set as a dependent variable and time points for study visits were included as repeated and fixed effects, while individual participants (ID) and study site as random effects. Inflammation markers that were significantly affected in the postprandial state ($p<0.05$) were included in a subsequent linear mixed model analysis that included time, fat source and their interaction as fixed factors, while ID and site were random factors.

RESULTS

A total of 20 (21%) inflammation markers were affected in the postprandial state ($p < 0.05$). Only GlycA was significantly different ($P = 0.002$) for time*fat source interaction. GlycA concentrations increased over the 6-hour period after consumption of both PUFA sources, corn oil (peaking at 2 hours) and flaxseed oil (peaking at 4 hours). SFA rich meals with butter and coconut oil did not significantly affect GlycA concentrations compared to baseline.

CONCLUSIONS

The RESULTS of the PI-Fat study demonstrates that 21% of the inflammation markers were affected in the postprandial state. Whether the source of fat is SFA or PUFA, seems to have a minor impact on postprandial inflammation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP21_03

ASSOCIATION OF FREE AND NON-FREE SUGAR INTAKE WITH DEMENTIA RISK AND THE MODULATING ROLE OF GUT MICROBIOTA: A PROSPECTIVE COHORT STUDY FROM UK BIOBANK

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BACKGROUND AND OBJECTIVES

While consumption of free sugars has been linked to an increased risk of dementia, the association between non-free sugar intake and incident dementia remains unclear. This study aimed to investigate the effects of sugar intake on dementia and to characterize the influence of gut microbiota on this association.

METHODS

In this cohort study, 158,408 participants from the UK Biobank were analyzed. Dietary intake of free and non-free sugars was assessed through repeated web-based 24-hour dietary recalls. Polygenic risk scores (PRS) for Alzheimer's disease and specific gut microbiota were calculated from individual-level genotype data. A cause-specific competing risk model was used to estimate hazard ratios (HRs) and confidence intervals (CIs) for the associations between sugar intake, PRS, and incident dementia.

RESULTS

Over a median follow-up of 9.94 years, 1,219 participants (0.7%) developed dementia. Non-free sugar intake was positively associated with the risk of dementia in a linear relationship (HR for Quartile 4 vs. Quartile 1 = 1.26, 95% CI: 1.04–1.52). A nonlinear relationship was observed between free sugar intake and dementia risk (HR for Quartile 4 vs. Quartile 1 = 1.43, 95% CI: 1.20–1.70; P for nonlinearity = 0.04). Significant interactions were found between non-free sugar intake and PRS for *Ruminococcaceae UCG-014* (P for interaction = 0.02), and between free sugar intake and PRS for *Oscillospira* (P for interaction = 0.03). Participants with lower *Ruminococcaceae UCG-014* scores or higher *Oscillospira* scores had a higher risk of dementia associated with sugar consumption.

CONCLUSIONS

Consumption of both free and non-free sugars is associated with an increased risk of dementia onset. The influence of gut microbiota imbalance on these associations is notable. These findings underscore the importance of reducing sugar intake in dementia prevention and highlight the potential role of gut microbiota in its development.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP21_04

DIETARY BIOTIN INTAKE AND THE RISK OF CHRONIC KIDNEY DISEASE (CKD): A LARGE-SCALE PROSPECTIVE COHORT STUDY AND MECHANISTIC EXPLORATION

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BACKGROUND AND OBJECTIVES

Chronic kidney disease (CKD), as an irreversible condition, affects over 800 million individuals globally. Among the multifaceted factors of CKD, lifestyle and dietary factors are considered paramount. Biotin plays an important role in certain metabolic disorders such as obesity and diabetes mellitus. However, the association between biotin and CKD remains unclear. Therefore, we conducted this study to investigate the association between biotin intake and the risk of incident CKD and preliminarily explore potential mechanisms.

METHODS

The prospective data in this population-based cohort study were derived from the UK Biobank, included 207,513 participants without a history of CKD who had completed at least one 24h dietary recall. Biotin intake was divided into low, moderate, and high groups by tertiles. Multivariable Cox proportional hazards models were used to establish the hazard ratios (HRs) for the associations between biotin intake and the risk of incident CKD, adjusted by demographic, lifestyle and other dietary factors. Stratified analyses were performed based on baseline age, sex and CKD subtypes. Sensitivity analysis was conducted among participants who had completed at least 2 times 24h dietary recall. Additionally, the STRING database was used to establish the protein-protein interaction (PPI) network for potential target genes of biotin and CKD. Based on PPI RESULTS, Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment analysis was further conducted in this study.

RESULTS

Compared with low group, moderate (HR = 0.85[0.81,0.89]) and high (HR = 0.77[0.73,0.82]) group had lower risk of CKD. Similar RESULTS were found in stratified analysis by gender and age. Biotin intake served as a significant protective factor in both acute and chronic renal failure, however, no significant association was observed for unspecified renal failure. The RESULTS also remained robust in sensitivity analysis. The PPI network comprised 62 nodes and 322 edges, featuring core genes like EGFR, CASP3, HSP90AA1, VMP9, CXCL6, SIRT1, MDM2, PARP1, ACC, C-CBL, PTGS2, and APAF1, which are key in CKD development and interact with biotin. KEGG analysis revealed that the core genes primarily affect cell proliferation, differentiation and apoptosis, as well as inflammatory and metabolic processes.

CONCLUSIONS

Our population-based study first revealed that dietary biotin plays a protective role in CKD, which may be mediated through renal electrolyte metabolism, cell proliferation and repair.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP21_05

MATERNAL PREBIOTIC SUPPLEMENTATION (GOS/INULIN) DURING PREGNANCY: EFFECTS ON THE IMMUNE SYSTEM AND ATOPIC DERMATITIS PREVENTION IN CHILDREN

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BACKGROUND AND OBJECTIVES

Atopic dermatitis (AD) is associated with early imbalances in the gut microbiota as well as in the cutaneous and peripheral immune systems. Prebiotics exhibit immunomodulatory properties and influence the composition and function of the microbiota. As prenatal life is a critical period for establishing immune tolerance, we investigated whether nutritional supplementation with prebiotics during pregnancy could prevent AD in children at high risk (PREGRALL clinical trial, NCT03183440). Despite observed modulation of the gut microbiota in mothers and children, no preventive effect on AD was found. This study aimed to characterize the impact of prebiotic supplementation during pregnancy on the immune system of mothers and children, and to understand the immune mechanisms involved in the onset of AD in children.

METHODS

The frequency of immune cell populations (T and B lymphocytes, dendritic cells) and their secretory functions were assessed using spectral flow cytometry in blood samples from 120 mothers recruited in the PREGRALL trial at 32 weeks of gestation (supplementation started at 20 weeks of gestation) and in blood samples from their children at 1 year of age.

RESULTS

At 32 weeks of gestation, the blood of mothers receiving prebiotic supplementation showed no significant differences compared to control mothers. However, the blood of children with AD at 1 year was significantly different from that of AD-free children born to prebiotic-supplemented mothers ($p < 0.01$), marked by an increase in biomarkers of immune tolerance and a decrease in biomarkers of allergy.

CONCLUSIONS

Prebiotic supplementation during pregnancy did not demonstrate a preventive effect on atopic dermatitis in children at 1 year of age but had a significant impact on their immune status by promoting tolerance and reducing pro-inflammatory biomarkers of allergy. These RESULTS suggest a potential preventive effect on other allergic diseases that may develop after the age of 1 year.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP21_06

MISALIGNMENT BETWEEN CIRCADIAN PREFERENCE AND ACCELEROMETER-DERIVED SLEEP-WAKE CYCLE WITH INCREASED RISK OF CARDIOMETABOLIC DISEASES

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BACKGROUND AND OBJECTIVES

The relationship of circadian misalignment, sleep-wake cycle, and cardiometabolic diseases (CMDs) remains unclear. This prospective study investigated the associations between circadian misalignment and CMDs, including type 2 diabetes (T2D), coronary heart disease (CHD), and stroke, and explored potential mechanisms.

METHODS

Data from 60,965 participants without pre-existing CMDs from the UK Biobank study and followed for an average of 7.9 years were analyzed. Circadian misalignment was determined by comparing self-reported chronotype and accelerometer-derived sleep timing. Incident CMDs were documented via multiple medical registries and self-reported information. Cox proportional hazards models were applied to estimate HRs and 95% CIs for these associations.

RESULTS

A U-shaped relationship between circadian misalignment and both T2D and CHD was observed. Compared to individuals with aligned midsleep and circadian preferences (the third quintile, Q3), those with advanced and delayed circadian misalignment had higher risks of T2D (HR: 1.22 [95% CI: 1.03-1.45] for Q1 and 1.39 [95% CI: 1.18-1.62] for Q5). Delayed circadian misalignment also associated with higher CHD risk (HR: 1.15 [95% CI: 1.01-1.31] for Q4 and 1.16 [95% CI: 1.02-1.33] for Q5). The association between delayed circadian misalignment and CMDs was greater in women (T2D, *Pinteraction* = 0.03) and younger adults (CHD, *Pinteraction* = 0.02). Early (HR: 1.19 [95% CI: 1.06-1.34]), rather than late, chronotype was associated with an increased T2D risk.

CONCLUSIONS

Both advanced and delayed circadian misalignment were associated with an increased CMD risk, highlighting the potential health benefits of aligning sleep-wake cycles with individual circadian preferences.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP21_07

MEDITERRANEAN DIETARY PATTERN AND BEHAVIOURAL INTERVENTION IN A NEW ZEALAND POPULATION AT INCREASED CARDIOMETABOLIC RISK: TWO SEQUENTIAL RANDOMISED CONTROLLED TRIALS; HE ROUROU WHAI PAINGA

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BACKGROUND AND OBJECTIVES

Cardiometabolic disease is common in New Zealand (NZ). Dietary patterns including the Mediterranean diet (MedDiet) are associated with a reduced risk of cardiovascular disease (CVD). The objectives are to test a) a NZ food-based Mediterranean diet (NZMedDiet) with behavioural intervention, and b) the effect of maintenance of the behavioural intervention on CVD health and wellbeing.

METHODS

Two sequential randomised, controlled trials (RCTs) were undertaken. The first (RCT1) was a randomised, controlled, multi-centre trial comparing 12 weeks (w) of NZMedDiet to usual diet in participants with increased CVD risk. The NZMedDiet group was provided with food, recipes and behavioural change support. At 12w, the usual diet group then received the intervention for 12w. The second RCT (RCT2) was undertaken after food provision discontinued in both groups (12 and 24w, respectively), and participants were randomised to ongoing behaviour change support versus no support for a further 12w. Primary and secondary outcome measures after 12 and 24w were the metabolic syndrome severity score (MetSSS) and quality of life (QoL) using the SF36, respectively.

RESULTS

Two hundred adults from a non-Mediterranean, multi-ethnic population took part. Baseline mean (sd) age was 49.8 (11.6)y and 49.9 (10.2)y in the NZMedDiet and control groups, respectively. In RCT1 at the end of 12w, there was no significant difference in mean MetSSS between the NZMedDiet and control group with an estimate (95% CI) of difference between groups; -0.05 (-0.16 to 0.06), p=0.35. No individual component of the MetSSS was different between groups at 12w. The difference between the NZMedDiet and control favoured a more Mediterranean dietary pattern at 12w ($p<0.001$). In RCT2, there was no significant difference in MetSSS between ongoing behaviour change support versus no support at the end of 24w with an estimate (95% CI) in mean MetSSS between the two groups; -0.02 (-0.12 to 0.09) (adjusted for baseline), p=0.75. There was a significant improvement in all components of QoL in the NZMedDiet compared with control in RCT1, but ongoing support made no difference to QoL in RCT2.

CONCLUSIONS

No improvement in the MetSSS in response to NZMedDiet over 12 or 24w was observed. Moving to a more Mediterranean dietary pattern alone is not enough to reduce the risk in this population. There was a significant improvement in QoL with the NZMedDiet and with withdrawal of food provision, ongoing support made no difference to QoL.

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CONFLICTS OF INTERESTS

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OAP21_08

ASSOCIATIONS BETWEEN A COLORECTAL CANCER RISK INDEX AND GUT MICROBIOME DIVERSITY AND COMPOSITION

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BACKGROUND AND OBJECTIVES

Colorectal cancer (CRC) is one of the most common and deadliest cancers worldwide. Lifestyle and anthropometric factors contribute significantly to CRC development, and the gut microbiome has been hypothesised to mediate these associations. However, studies to date have focused on the microbiome's associations with individual CRC risk factors, and the complex interactions between these factors have not been considered. Therefore, we studied associations of a lifestyle-based CRC risk index with microbial diversity and composition.

METHODS

We used data from the National FINRISK/FINDIET 2002 Study, including 1228 Finnish adults (55% women) aged 25–64 years. Diet was assessed with 48-hour dietary recalls. The CRC risk index included lifestyle and anthropometric factors strongly associated with CRC (body mass index [BMI], waist circumference [WC], height, physical activity, consumption of whole grains, dairy products, red and processed meat, and intake of alcohol). The index was scored between 0 and 4 points, higher scores indicating more favourable risk factor profiles for CRC prevention. The gut microbiome was analysed using shallow shotgun sequencing on whole metagenomic data. Individual microbial (alpha) diversity was assessed with the Shannon index and compositional differences (beta diversity) with the Bray-Curtis dissimilarity score. Statistical tests included linear models and permutational multivariate ANOVAs.

RESULTS

The CRC risk index was positively associated with alpha diversity (β 0.037, *P* 0.009). Of the index components, being physically active versus inactive was associated with a higher alpha diversity (β 0.091, *P* 0.042), whereas a higher BMI and WC were associated with a lower alpha diversity (BMI: β -0.045, *P* 0.002; WC: β -0.048, *P* 0.003). The dietary components were not statistically significantly associated with alpha diversity. The CRC risk index, as well as all index components, except for height and red meat consumption, were associated with beta diversity, explaining 0.1−0.4% of the variation in microbial compositions between participants (*P* <0.05).

CONCLUSIONS

Our RESULTS suggest that having more favourable risk factors for CRC prevention was associated with a higher individual microbial diversity compared with fewer favourable factors. Additionally, the CRC risk index contributed to compositional differences between participants. These findings support previous research indicating an inverse association between CRC risk and microbial diversity. Further research is needed to elucidate the underlying mechanisms.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP21_09

FOLATE DEPLETION ALTERS DNA METHYLATION IN TISSUES RELEVANT FOR CHILDHOOD LEUKAEMIA

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BACKGROUND AND OBJECTIVES

Epidemiological evidence suggests maternal folate status influences childhood leukaemia risk; however, the underlying mechanisms are unclear. Genetic aberrations are considered leukaemia-initiating events, however, alone they are not sufficient for disease, with additional 'hits' required. Epigenetic alteration, i.e. DNA methylation, is one mechanism by which maternal folate is likely to contribute to disease. We investigated the relationship between folate depletion and DNA methylation in murine tissues relating to childhood leukaemia.

METHODS

Female mice were allocated low or normal folate diets for 4 weeks before mating and onwards. Offspring were sampled at 17.5 days gestation and weaning. DNA was isolated from fetal livers and bone marrow of weaned mice. Tissues correspond to specific sites of haematopoiesis throughout the lifecycle relevant to leukaemic blasts. Epigenome-wide DNA methylation was profiled using Infinium® MouseMethylation BeadChips. R/Bioconductor packages identified differentially methylated points (DMP) and regions (DMRs). Pathway analysis was conducted by DAVID.

RESULTS

There were 598 DMPs (382 hypermethylated/216 hypomethylated) and 363 DMRs with significantly (FDR) altered methylation in response to folate depletion in the fetal liver. In bone marrow, 1206 DMPs (334 hypermethylated/852 hypomethylated) and 565 DMRs had significantly altered methylation in response to folate depletion. Only 3 DMPs and 13 DMRs were altered in both tissue types, suggesting highly tissue specific responses. Pathway analysis suggested 15 and 44 pathways could be altered in response to folate depletion in liver and bone marrow respectively, with 8 overlapping between tissues.

CONCLUSIONS

Whilst loci specific altered methylation appears to be different between tissues, the impact on biological pathways is similar.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 38 - NON COMMUNICABLE DISEASES

OAP38_01

IS A HIGHER METABOLIC SYNDROME SCORE ASSOCIATED WITH BREAST DENSITY AFTER PUBERTY ONSET?

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BACKGROUND AND OBJECTIVES

Metabolic syndrome (MS) is associated with an increased risk of breast cancer (BC). Puberty is a critical window of susceptibility for BC and there is limited information if MS during this period will increase BC risk. Breast density (% fibroglandular volume [%FGV]) is one of the strongest risk factors for BC and serves as an intermediate marker that can be measured at a younger age. A previous study by our group did not observe an association between MS and %FGV or absolute fibroglandular volume (AFGV) in premenopausal women. However, we observed a positive association between serum triglycerides (TG) and abdominal obesity with AFGV. Thus, the aim of this study was to evaluate the association between MS, measured at ages 16 and 19 years, and breast density parameters (%FGV and AFGV).

METHODS

Longitudinal follow-up of 602 girls recruited in 2006 (3.5y) from child care centers. We selected girls who had anthropometric data (body mass index (BMI) and waist circumference (WC)), metabolic data (insulin, glycemia, HDL-C, TG), blood pressure (BP), and breast density measurements by DXA at 16 and 19 y. Given the low prevalence of MS at this age (3-11%), we used the metabolic syndrome score (MetScore), derived by standardizing each component and summing the following variables: WC, systolic and diastolic BP, fasting insulin and glucose, and the TG/HDL-C ratio. We performed mixed linear effect models to evaluate the association of MetScore and each of its standardized components with %FGV and AFGV. Models were adjusted by BMI, age at menarche onset, and maternal education.

RESULTS

We collected data on 444 girls. The prevalence of obesity was 15.4% at 16y. Girls with obesity had a higher MetScore (16y: 3.3±0.3 vs. -0.5±0.1). MetScore and WC were inversely associated with %FGV in fully adjusted models (βMetS:-0.4; 95%CI:-0.8, -0.01 and βWC:-5.4; 95%CI:-7.0, -3.7). Glycemia, insulin, TG/HDL-C, and BP were negatively associated with %FGV, but it was lost after adjusting for BMI. In contrast, MetScore and insulin were positively associated with AFGV adjusting by age at menarche and maternal education (βMetS:4.9; 95%CI:2.6, 7.3 and βInsulin:7.0; 95%CI:0.5, 13.4), while WC was positively associated with AFGV even after adjusting for BMI (βWC:29.0; 95%CI:15.7, 42.3).

CONCLUSIONS

We observed an inverse association between MetScore and %FGV even after adjusting for BMI, but a positive association between MetScore and AFGV after adjusting for age at menarche and maternal education only. The latter could suggest that a higher metabolic risk during puberty could be a risk of breast cancer during adulthood, through a higher AFGV.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP38_02

ASSOCIATION BETWEEN MUSHROOM CONSUMPTION AND DIGIT SPAN PERFORMANCE AMONG MIDDLE-AGED AND OLDER COMMUNITY-DWELLING JAPANESE: THE NILS-LSA PROJECT

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BACKGROUND AND OBJECTIVES

Previous evidence shows that habitual consumption of mushrooms may benefit cognitive function. However, the relationship between mushroom consumption and working memory is remains unclear. This study aims to investigate this relationship.

METHODS

The analysis included 3,162 participants who participated in one or more of the third to ninth waves (2002−2022) of the National Institute for Longevity Sciences-Longitudinal Study of Aging and had complete data on mushroom consumption, digit span scores, and covariates. Consumption of mushrooms (g/day) at baseline was measured by 3-day dietary records. Working memory was assessed by (forward and reverse) digit span scores (range: 0−14 for each) from the Wechsler Adult Intelligence Scale-R. The relationships between mushroom consumption and (forward and reverse) digit span scores were analyzed using mixed-effects models with splines, adjusted for baseline information on centered age, square of centered age, sex, follow-up duration, energy intake, consumption of seafood, vegetables, and fruit, body mass index, smoking status, total physical activity, education level, medical history, and depressive symptoms.

RESULTS

The mean (standard deviation, SD) age of participants was 57.9 (13.1) years, and the mean (SD) follow-up duration was 10.5 (6.1) years. After full adjustment, natural spline regression with two degrees of freedom revealed a significant non-linear association between mushroom consumption and both forward digit span score (spline terms β_1 =1.189, p-value =0.0118; β_2 =2.509, p-value =0.0258) and reverse digit span scores (spline terms β_1 =0.961, p-value =0.0373; β_2 =2.157, p-value =0.0497), with higher mushroom consumption being related to better digit span scores.

CONCLUSIONS

Among community-dwelling middle-aged and older Japanese adults, mushroom consumption was associated with changes in digit span scores, suggesting habitual consumption of mushrooms may be beneficial for cognitive function, especially for working memory, during aging.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP38_03

THE EFFECTIVENESS OF MEDIUM-CHAIN TRIGLYCERIDES OIL ON BLOOD LIPID PROFILES AND FASTING BLOOD GLUCOSE IN OVERWEIGHT AND OBESE WOMEN IN NORTH VIETNAM

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BACKGROUND AND OBJECTIVES

The rising prevalence of obesity, particularly among women, has become a significant public health concern worldwide. In Vietnam, obesity rates among women have surged, especially in urban areas. Women aged 20-45, who are at higher risk due to imbalanced diets and limited physical activity, often experience obesity-related metabolic disturbances. Medium-chain triglycerides (MCTs) have been investigated for their potential to promote weight loss and improve metabolic health, but studies, particularly in Vietnamese populations, remain limited.

This study aimed to evaluate the effectiveness of MCT oil on blood lipid profiles and fasting blood glucose in overweight and obese women in North Vietnam.

METHODS

A randomized, double-blind, community-based intervention trial was conducted from July 2019 to March 2020 in Bac Giang Province. A total of 161 women aged 20-45 with a BMI ≥ 25 kg/m² and < 40 kg/m² participated. The intervention group (n=81) consumed 20 ml/day of 100% MCT oil combined with 100g of low-sugar yogurt, while the control group (n=80) received soybean oil under similar conditions. The intervention duration was four months, with evaluations at baseline, 2 months, and 4 months.

RESULTS

The intervention group showed significant improvements in blood lipid indices and fasting blood glucose compared to the control group. After 2 months, the average reduction in total cholesterol was -0.19 mmol/L (95% CI: -0.38, -0.01; $p < 0.05$), and after 4 months, it decreased by -0.25 mmol/L (95% CI: -0.48, -0.03; $p < 0.05$). Triglyceride levels in the intervention group dropped by -0.23 mmol/L (95% CI: -0.43, -0.02; $p < 0.05$). No significant changes were observed in fasting blood glucose levels.

CONCLUSIONS

The use of MCT oil as a dietary supplement for 2 to 4 months is associated with significant improvements in blood lipid profiles (total cholesterol and triglycerides) in overweight and obese women. These findings suggest that MCT oil may serve as an effective dietary strategy for managing obesity-related metabolic disturbances in this population. Further studies are needed to explore its long-term effects and potential benefits on other metabolic parameters, including fasting blood glucose.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP38_05

ASSOCIATION OF SUGAR SWEETENED AND ARTIFICIALLY SWEETENED BEVERAGES AND CANCER RISK: A SYSTEMATIC LITERATURE REVIEW AND META-ANALYSIS OF COHORT STUDIES

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BACKGROUND AND OBJECTIVES

Available evidence suggests that frequent consumption of sugar sweetened beverages [SSB] is associated with weight gain, and that replacing SSB with artificially sweetened beverages [ASB] could result in small improvements in body weight. Nevertheless, the evidence regarding the relationship between the consumption of SSB and ASB and the risk of site-specific cancers remains inconclusive and requires further clarification. We performed a systematic review as part of the World Cancer Research Fund International Global Cancer Update Programme (CUP Global).

METHODS

We performed a systematic search in PubMed and Embase to September 2024 to find cohort studies investigating the associations between SSB and ASB consumption and risks of site-specific cancer incidence or mortality. We conducted random-effects dose-response meta-analyses to estimate the summary relative risks (RRs) and 95% confidence intervals (CIs).

RESULTS

A total of 68 publications (37 cohorts) reporting on 22 cancer outcomes were included. We found that each one serving [355 ml] per day increment in SSB intake was associated with a 5% higher risk of postmenopausal breast cancer incidence (RR: 1.05, 95%CI: 1.00, 1.10; p = 0.031, n = 6), and that one serving/day increase in carbonated SSB intake was associated with a 13% higher risk of pancreas cancer (RR: 1.13, 95%CI: 1.04, 1.26; n=14). For mortality outcomes, the RRs for one serving/day increment in SSB consumption were 1.02 (95%CI: 1.00, 1.04; p = 0.027, n = 4) for colorectal cancer mortality, 1.38 (95%CI: 1.11, 1.71; p = 0.004, n = 2) for proximal colon cancer mortality, and 1.06 (95%CI: 1.02, 1.10; p = 0.003, n = 2) for kidney cancer mortality. We also found positive associations between ASB and kidney cancer incidence (RR: 1.25, 95%CI: 1.00, 1.55; p = 0.046, n = 2), and carbonated ASB and leukemia incidence (RR: 1.29, 95%CI: 1.01, 1.64; p = 0.038, n = 2). Replacing one serving of SSB with ASB was associated with a lower risk of proximal colon cancer incidence (RR: 0.84, 95%CI: 0.77, 0.95; n = 2) and mortality (RR: 0.80, 95%CI: 0.71, 0.95; n = 2). No association was found for other cancer outcomes.

CONCLUSIONS

Higher consumption of SSB was associated with higher risks of postmenopausal breast cancer and pancreatic cancer incidence and kidney cancer and proximal colon cancer mortality, and higher intake of ASB was associated with a higher risk of kidney cancer and leukemia incidence. Evidence from this review will be concluded by the CUP Global Expert Panel and considered for any refinements to the current recommendations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP38_06

ESTIMATING THE DIETARY AND HEALTH IMPACT OF IMPLEMENTING MANDATORY FRONT-OF-PACKAGE NUTRIENT DISCLOSURES IN THE US: A POLICY SCENARIO MODELING ANALYSIS

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BACKGROUND AND OBJECTIVES

Recognized as a cost-effective policy to promote healthier diets, mandatory front-of-package labeling (FOPL) identifying foods high in sodium, sugar, and saturated fat has been adopted and implemented in ten countries and is currently under consideration in several others including the US. However, its potential impact on dietary intake and health have not yet been estimated in the US context. This study aims to estimate (1) the potential dietary impact of implementing mandatory nutrient-specific FOPL among US adults; and (2) the number of diet-related non-communicable disease (NCD) deaths that could be averted or delayed due to estimated dietary changes.

METHODS

Baseline and counterfactual dietary intakes of sodium, sugars, saturated fats, and calories were estimated among US adults (n=7,572) using both available days of 24h recall data from the 2017-2020 National Health and Nutrition Examination Survey (NHANES). The National Cancer Institute method was used to estimate usual intakes and distributions, adjusting for age, sex, misreporting status, weekend/weekday, and sequence of recall. To estimate counterfactual dietary intakes, we modeled two reduction scenarios observed in experimental and observational studies that examined changes in sodium, sugars, saturated fat and calorie content of food and beverage purchases due to nutrient-specific 'high in' FOPL. This study used the Preventable Risk Integrated ModEl (PRIME) to estimate potential health impacts.

RESULTS

Estimated mean dietary reductions of 156 mg and 259 mg/day of sodium, 10.1 g and 7.2 g/day of sugars, 1.08 g and 4.49 g/day of saturated fats, and 38 kcal and 57 kcal/day of calories were observed under the two policy scenarios tested. Between 96,926 (95% UI 89,011-105,284) and 137,261 (95% UI 125,534-148,719) diet related NCD deaths, primarily from cardiovascular diseases (74%), could potentially be averted or delayed by implementing mandatory nutrient-specific FOPL in the US. Overall, more lives would be saved in males than females.

CONCLUSIONS

Findings suggest that implementing mandatory nutrient-specific FOPL in the US could significantly reduce sodium and total sugar intakes among US adults, resulting in a substantial number of NCD related deaths that could be averted or delayed. Our RESULTS can inform current food policy developments in the US regarding the adoption and implementation of FOPL regulations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP38_07

FRAMING AS CORPORATE POLITICAL ACTIVITY STRATEGIES OF PORTUGAL'S FOOD INDUSTRY: IMPLICATIONS FOR PUBLIC HEALTH POLICIES

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BACKGROUND AND OBJECTIVES

The food industry plays a significant role in the population's poor health, particularly through the promotion and availability of ultra-processed foods (UPFs), which are linked to non-communicable diseases (NCDs) and public health challenges [1]. This research examines the Corporate Political Activity (CPA) of Portugal's food sector as a potential source of influence on public health policies. Previous studies have analysed the industry's actions [2], and this study focuses on framing strategies.

METHODS

Following the qualitative method outlined by Mialon et al. from the International Network for Food and Obesity/NCDs Research, Monitoring and Action Support (INFORMAS) [3], key industry actors were identified through expert consultation and EuroMonitor data. Publicly available information retrieved from official websites of industry, government, and academic sources was analyzed. A thematic analysis was conducted to categorise CPA practices using the Taxonomy of Framing Strategies [4], which is divided into five categories. Data were collected from October 2023 to April 2024, covering materials published in 2022 and 2023.

RESULTS

This analysis reveals that the food sector in Portugal predominantly uses the 'good' actor framing within the broader category of corporations, with almost all entities presenting themselves as socially responsible, key economic contributors, and legitimate scientific actors committed to preventing non-communicable diseases (NCDs) and reducing health harms, although there are variations. Seven actors framed public health issues as caused by a minority of consumers and not the result of the industry's products or services (the 'trivial' or 'individual problem'). Five actors focused on solutions targeting individuals rather than the entire population (the acceptable, 'good' solution). The unacceptable, 'bad' solution was referenced by only two actors, who rejected whole-population or statutory solutions, such as public health policies or regulations. No examples of the 'bad' actor framing were found. Coca-Cola was the most frequent user of the 'good' actor framing, followed by Cerealis and Ferrero. Danone emphasised individual problems, while the Federation of Portuguese Food Industries (FIPA) referenced statutory measures more than others. Novarroz had no strategies, and Primor Charcutaria-Prima, S.A. made minimal use of framing strategies.

CONCLUSIONS

The food industry consistently positions itself as a responsible actor while downplaying systemic challenges and promoting individual-focused solutions. These framing strategies reveal how the industry may shape public health discourse to align with its interests.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP38_08

ASSOCIATION BETWEEN OXIDATIVE BALANCE SCORE AND COGNITIVE FRAILTY DEVELOPMENT THROUGH DIFFERENT TRANSITION PATHWAYS AMONG COMMUNITY-DWELLING OLDER ADULT JAPANESE INDIVIDUALS: THE NILS-LSA PROJECT

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BACKGROUND AND OBJECTIVES

Cognitive frailty (CF), characterized by concurrent cognitive impairment and physical frailty (PF), has a complex pathogenesis. Previous evidence suggests that oxidative balance score (OBS) may be associated with cognitive impairment and PF. However, the effect of OBS on the transition from robustness to CF through cognitive impairment or PF pathways remains unclear. We investigated the association between OBS and CF onset using longitudinal data from community-dwelling older Japanese adults.

METHODS

We analyzed data from waves 2 (2000–2002) through 7 (2010–2012) of the National Institute for Longevity Sciences-Longitudinal Study of Aging. The study included 1,064 older adults (baseline age: 60–83 years; 51.4% male) who participated in multiple surveys (maximum follow-up: 10.8 years), had complete data, Mini-Mental State Examination (MMSE) scores ≥24, and were dementia- and CF-free at baseline. We calculated total OBS (range: 0–34; higher score indicates better oxidative balance) using 12 dietary factors (nutrient-food-OBS, range: 0–24) and 5 lifestyle factors (lifestyle-OBS, range: 0–10). We defined mild cognitive impairment (MCI) as MMSE scores of 24–27, PF as the presence of ≥1 Cardiovascular Health Study criteria, and CF as concurrent MCI and PF. Using multistate modeling, we estimated hazard ratios (HRs) and 95% confidence intervals (CIs) of sex-specific total OBS tertiles (T1–T3) for transitions between robustness (no MCI/PF), MCI, PF, and CF states, adjusting for potential confounders including age, sex, APOE genotype, body mass index, medical history, education level, depressive symptoms, and living arrangement.

RESULTS

At baseline, the proportions of participants with robustness, MCI, and PF were 36.7%, 14.8%, and 48.6%, respectively. The mean ± SD of total OBS for T1, T2, and T3 were 12.5 ± 2.1, 16.4 ± 1.1, and 19.9 ± 1.7 points. Among individuals with MCI, higher total OBS was associated with decreased CF risk. The multivariable-adjusted HRs (95% CI) were 1.00 (reference) for T1, 0.46 (0.23, 0.92) for T2, and 0.43 (0.20, 0.93) for T3 (p-trend =0.016). This protective effect was primarily attributed to nutrient-food-OBS.

CONCLUSIONS

These findings suggest that dietary interventions targeting older adults with MCI may help prevent or delay CF onset. Future randomized controlled trials are needed to confirm these associations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP38_09

EFFICACY OF A REMOTE DIETARY INTERVENTION TO IMPROVE DIETARY HABITS IN WOMEN WITH BREAST CANCER: THE LIFEBREAST TRIAL

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BACKGROUND AND OBJECTIVES

Given the disease burden of breast cancer and the established benefits of the Mediterranean diet (MedDiet) in its prevention, we conducted a trial to evaluate the effects of a dietary intervention promoting adherence to a Mediterranean diet supplemented with extra-virgin olive oil (MedDiet+EVOO) compared to a low-fat diet intervention for the tertiary prevention of early breast cancer recurrence.

METHODS

The LifeBreast trial is a multicenter, randomized study evaluating a nutritional intervention with a MedDiet+EVOO compared to a low-fat diet in 375 women with stage I, II, or IIIA breast cancer. Randomization was centralized and stratified by recruitment center and menopausal status in a 1:1 ratio to either (i) the MedDiet+EVOO intervention or (ii) the low-fat dietary control.The intervention is delivered remotely via telephone and a custom-designed electronic platform, with annual in-person follow-up visits. Participants in the MedDiet+EVOO group received 0.5 L of EVOO per week during the first two years.At baseline and annual follow-up visits, data collection includes adherence scores for both diets (0–13 points for the MedDiet and 0–9 points for the low-fat diet), a food frequency questionnaire, quality-of-life assessments, biological samples, anthropometric measurements, and clinical data. Linear mixed models were used to evaluate between-group changes in dietary adherence over the first two years of follow-up.

RESULTS

Between 2020 and 2023, 376 participants were recruited and randomized, with 189 allocated to the MedDiet+EVOO group and 187 to the low-fat diet group. The mean age was 54 years, and 54% of participants were premenopausal.Over two years, adherence to the low-fat diet increased by 1.9 points (95% CI: 1.4, 2.3) in the low-fat diet group, while no significant change was observed in the MedDiet+EVOO group [0.02 points (95% CI: -0.27, 0.31)] ($p<0.001$ for time*group interaction). Conversely, adherence to the MedDiet increased by 2.9 points (95% CI: 2.5, 3.3) in the MedDiet+EVOO group, whereas no significant change was observed in the low-fat diet group [0.04 points (95% CI: -0.32, 0.40)] ($p<0.001$ for time*group interaction).

CONCLUSIONS

The remote intervention in the LifeBreast trial effectively modified participants' dietary patterns, promoting a healthier diet.

CONFLICTS OF INTERESTS

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OAP 43 - NON COMMUNICABLE DISEASES

OAP43_02

DEVELOPING POLICIES TO ADDRESS DIET-RELATED NON-COMMUNICABLE DISEASES MUST MEANINGFULLY ADDRESS CORPORATE POLITICAL ACTIVITY AND CONFLICTS OF INTEREST

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BACKGROUND AND OBJECTIVES

Increasingly, limiting corporate influence on public policy is recommended to accelerate evidence-based control measures for non-communicable diseases (NCDs). Few studies have reported on how mechanisms can be implemented to limit policy influence, and even fewer have evaluated their effectiveness. In this study, we deployed and evaluated a training intervention among food policymakers regarding corporate interference and strategies to limit policy influence during the implementation of four WHO-recommended best buys.

METHODS
A two-day training intervention for public health policymakers on corporate influence in policy was developed and evaluated using a baseline and endline design. A literature review informed the workshop's design and evaluation. The workshop content was based on an evidence-informed handbook developed by the authors. The following topics were discussed during the workshop: the food regulatory environment, the commercial determinants of health, strategies used by commercial actors to influence policies, and conflicts of interest. Participants were also invited to work in small groups to identify mechanisms for limiting corporate influence in their practice. Using survey METHODS, we evaluated policymakers' perceived competencies and skills in recognizing and addressing policy influence before and after the workshop. Wilcoxon rank-sum test was employed to detect significant variations between baseline and endline data collected through survey METHODS, with alpha set at 0.05 in Stata/IC 15.0.
RESULTS

Twenty-three and seventeen policymakers participated in the baseline and endline evaluation, respectively. Before the workshop, some participants reported previous interactions with commercial actors, including receiving job offers, promotional materials, and funding for travel. After the workshop, we observed a modest increase in awareness of commercial actors using such strategies to influence policymaking, though it was not statistically significant. The mean rating of the perceived appropriateness of using these techniques by corporations to influence public policies significantly ($p<0.001$) decreased after the workshop. Participants' self-reported competencies and skills in identifying and countering these strategies significantly ($p<0.05$) increased after the workshop.

CONCLUSIONS

The training on corporate influence on public health policies enhanced food policymakers' skills and competencies in limiting policy influence in the short term. However, to address these issues at a more systemic level, a broader approach is recommended.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP43_03

Naturally Occurring and Added Glutamate and Risk of Cardiovascular Diseases – RESULTS From a Large Prospective Cohort

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BACKGROUND AND OBJECTIVES

Monosodium glutamate (MSG) is a food additive used in many industrially processed foods to enhance flavour, and glutamic acid is an amino acid naturally occurring in various animal-based and vegetable foods. The potential cardiac toxicity of glutamate is debated and has been suggested by some epidemiological and experimental studies. This study aimed to investigate the associations between food additive and natural glutamate exposures and cardiovascular disease (CVD) risk, including cerebrovascular disease (CVA) and coronary heart disease (CHD) risks in a large prospective cohort of French adults.

METHODS

Participants (n=108,932, 79.3% women, mean age=42.4 years, SD=14.5) were 15 years old and above from the French NutriNet-Santé prospective cohort (2009-2023). We assessed dietary intakes using repeated 24h-dietary records and exposure to food additive glutamate using food composition databases and laboratory assays. We characterised associations between cumulative time-dependent continuous exposures to total glutamate, natural glutamic acid, MSG and risk of CVD, CVA, and CHD using multivariable proportional hazards Cox models adjusted for known risk factors for standardised increments of glutamate intake.

RESULTS

During follow-up (median 7.92 years), 2397, 1113, and 1284 participants were diagnosed with CVD, CVA, and CHD respectively. Higher intakes of naturally occurring glutamic acid (HRper 3000 mg/d increment=1.08, 95% CI [1.01-1.16], p-value=0.03), food additive MSG (HR per 200 mg/d increment=1.05, 95% CI [1.01-1.09], p-value=0.03), and total glutamate (HRper 3000 mg/d increment=1.09, 95% CI [1.01-1.17], p-value=0.02) were associated with higher risks of CHD (p-value for non-linearity>0.6).

CONCLUSIONS

This large prospective cohort study revealed positive linear associations between exposure to natural and the widely used glutamate food additive MSG (E621) and coronary heart disease risk. These original RESULTS provide additional evidence to previous experimental data showing a role of glutamate in regulating heart functioning at physiological doses, while also suggesting heart rate dysfunction at higher exposures. Altogether, these elements encourage caution regarding the consumption of high amounts of glutamate, in the context of cardiovascular risk prevention.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP43_04

DEVELOPMENT OF INDICATORS REFLECTING HEALTHY AND UNHEALTHY PLANT-BASED DIETARY PATTERNS INTEGRATING THE LEVEL OF FOOD PROCESSING AND THEIR LONGITUDINAL ASSOCIATION WITH THE RISK OF CARDIOVASCULAR DISEASES

Clémentine Prioux[1]; Emmanuelle Kesse-Guyot[1]; Bernard Srour[1]; Léopold Fezeu[1]; Julia Baudry[1]; Sandra Wagner[2]; Serge Hercberg[1]; Mathilde Touvier[1]; Benjamin Allès[1]
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BACKGROUND AND OBJECTIVES

Very few studies have examined the link between plant-based dietary patterns and health accounting for the level of processing, while the latter represents a major challenge with the current increasing intake of ultra-processed foods worldwide. This study aimed to develop new dietary indices combining the contribution of plant food consumption and the level of food processing, to assess their association with the risk of cardiovascular disease, and to compare these associations with those obtained when the level of food processing is not integrated, in a French cohort.

METHODS

We analyzed data from participants in the NutriNet-Santé prospective online cohort (2009-2024). First, the two original healthy Plant Based Diet (hPDI) and unhealthy Plant-Based Diet (uDPI) scores were computed using data from 24h records. Each component of the two scores was multiplied by a factor corresponding to i) the contribution of unprocessed food, ii) the contribution of ultra-processed foods, using the NOVA classification, leading to four new scores. A higher hPDI-unprocessed score reflected a diet richer in plant-based foods which were both healthy and unprocessed, whereas a higher hPDI-ultraprocessed score reflected a diet richer in ultra-processed plant-based foods, and conversely for uPDI-unprocessed and uPDI-ultraprocessed. The association between each one of the six scores and the incidence of cardiovascular diseases (cerebrovascular and coronary) was estimated using multivariable Cox proportional hazards models, adjusted for potential confounding factors.

RESULTS

A total of 63,830 participants were included (mean follow-up duration 9.0 years [SD=4.7]). Individuals with the highest intake of healthy and unprocessed plant foods (hPDI-unprocessed) had a 30% lower risk of developing a cardiovascular disease (HR10th vs, 1st decile hPDI-unprocessed: 0.70; 95% CI: 0.54, 0.89; *p-trend*= 0.01). There was no significant association between the hPDI-ultraprocessed score and cardiovascular disease risk. Individuals with the highest intake of unhealthy and ultraprocessed plant foods had a 35% greater risk of developing a cardiovascular disease (HR10th vs, 1st decile uPDI-ultraprocessed: 1.35; 95% CI: 1.06, 1.72; *p-trend*= 0.008).

CONCLUSIONS

Our findings indicate the necessity of incorporating the degree of food processing in future investigations examining the relationship between plant-based diets and health outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP43_05

ULTRA-PROCESSED DIETS AND LONG-TERM CARDIOVASCULAR DISEASE MORTALITY AMONG MYOCARDIAL INFARCTION SURVIVORS: A PROSPECTIVE ANALYSIS OF THE ALPHA OMEGA COHORT

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BACKGROUND AND OBJECTIVES

Current evidence links ultra-processed diets to an increased risk of cardiovascular disease (CVD) mortality. Whether ultra-processed diets present similar associations with mortality risk in CVD patients remains unknown. We examined the diet quality of ultra-processed diets and the association of these diets with total CVD mortality, ischemic heart disease (IHD) mortality, and stroke mortality in patients with a history of myocardial infarction (MI).

METHODS

We analyzed data from 4365 post-MI patients in the Alpha Omega cohort. Dietary data were collected at baseline (2002-2006) using a 203-item Food Frequency Questionnaire (FFQ). Diet quality was assessed using the Dutch Healthy Diet Index adapted for CVD patients (DHD-CVD, range 0-150). Ultra-processed foods (UPF) were identified and categorized according to the Nova classification system, converted to %grams/day, and divided into quartiles (Q). Q1 and Q4 of %g/day of UPF represented a low and a high ultra-processed dietary pattern, respectively. Hazard Ratios (HRs) for CVD, IHD and stroke mortality were obtained from multivariable Cox regression models.

RESULTS

Most patients were men (79%) on cardiovascular medication (88%). Mean caloric intake was 1914kcal/day. Mean UPF contribution was 962kcals (Q1 vs Q4 = 664 vs 1199kcal), 18%g (Q1 vs Q4 = 9 vs 29%g), and 53%kcals (Q1 vs Q4 = 42 vs 62%kcals). Compared to Q1, Q4 had higher intakes of total energy, lower intakes of non-ultra-processed foods, particularly fruit and leafy and cruciferous vegetables. DHD-CVD scores decreased slightly across quartiles (Q1 vs Q4 = 95 vs 82). Over a median follow-up of 14 years, 1012 participants died from CVD (659 from IHD, 208 from stroke). Compared to a low ultra-processed diet, a high ultra-processed diet was not significantly associated with CVD and IHD mortality. However, it was associated with a higher risk of stroke mortality (HRQ4 vs Q1: 1.51, 95% CI: 1.01-2.28; and HRper10% increase: 1.22, 95% CI: 1.03-1.43). This association was stronger in older patients with higher BMI, lower physical activity, and lower socio-economic status.

CONCLUSIONS

A high ultra-processed diet was linked to higher risk of stroke mortality, but not CVD and IHD mortality. IHD may have been better managed through medication in this sample of drug-treated post-MI patients. While further research is needed, RESULTS lend some support to the importance of diet in the secondary prevention of stroke mortality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP43_06

Food Additive Preservatives and Antioxidants and Risk of Cancer – RESULTS From a Large Prospective Cohort

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BACKGROUND AND OBJECTIVES

Food additives such as preservatives and antioxidants are frequently and ubiquitously used to increase shelflife and protect consumers against the growth of pathogenic micro-organisms and the deterioration caused by these pathogens or by oxidation. This study aimed to investigate for the first time, the associations between exposures to a wide range of preservatives and antioxidants and cancer risk in a large population-based cohort.

METHODS

Participants (n=105,260, 78.7%women, mean age=42.0y, SD=14.5) from the French NutriNet-Santé cohort (2009-2023) completed repeated 24h-dietary records including specific brands of industrial products. Preservative and antioxidant exposures were assessed using composition databases and laboratory assays. We characterised associations between time-dependent exposures to additives and risk of cancer using multivariable Cox models adjusted for known confounders. Exposures were coded into 3 categories (sex-specific tertiles or non-consumers/lower/higher consumers separated by the sex-specific median).

RESULTS

4226 incident cancer cases were identified during follow-up (including 352 colorectal, 508 prostate, 1208 breast and 2315 obesity-related cancer cases). Higher intakes of the following additives were associated with higher cancer risks: potassium sorbate (E202) with higher risk of overall (Hazard Ratio (HR)T3vsT1= 1.14[1.04-1.24]), breast (1.26[1.07-1.49]) and obesity-related (1.23[1.09-1.39]) cancers; potassium metabisulphite (E224) with overall (1.11[1.03-1.20]), breast (1.20[1.04-1.38]), and obesity-related (1.13[1.02-1.25]) cancers; sodium nitrite (E250) with prostate (1.32[1.02-1.70]), and obesity-related (1.16[1.04-1.30]) cancers; potassium nitrate (E252) with overall (1.13[1.05-1.23]), breast (1.22[1.05-1.41]) and obesity-related (1.20[1.08-1.34]) cancers; acetic acid (E260) with overall cancer (1.12[1.01-1.25]); sodium ascorbate (E301) with obesity-related cancers (1.11[1.00-1.24]); sodium erythorbate (E316) with overall (1.12[1.04-1.22]), breast (1.21[1.04-1.41]) and obesity-related (1.19[1.06-1.33]) cancers. In contrast, higher intakes of food additive phosphoric acid (E338) and extracts of rosemary (E392) were associated with lower risks of prostate (0.49[0.25-0.95]) and colorectal (0.69[0.50-0.94]) cancers, respectively.

CONCLUSIONS

This large prospective cohort revealed mainly positive associations between exposure to several food additive preservatives and antioxidants widely used in industrial foods and increased risk of several cancer locations. Several mechanistic studies support these findings and encourage the re-evaluation of these food additives.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP43_07

ULTRA-PROCESSED FOOD CONSUMPTION AND RISK OF HYPERTENSION AMONG PARTICIPANTS WITH AND WITHOUT OBESITY: INSIGHTS FROM THE NUTRINET BRASIL COHORT

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BACKGROUND AND OBJECTIVES

Obesity has been increasing globally, and no country has yet managed to stop it. Scientific evidence increasingly highlights the role of ultra-processed foods for obesity and several health outcomes. However, little is known about the effect of ultra-processed foods on health prognosis of individuals with pre-existing obesity. We aimed to analyse the prospective association between ultra-processed foods intake and the risk of hypertension among individuals with and without obesity.

METHODS

The NutriNet Brazil study collects data from Brazilian adults through self-administered online questionnaires. Participants with obesity were identified based on their baseline BMI (≥ 30.0 kg/m²). Dietary intake was assessed using the Nova 24-h dietary recall screener, which captures two opposing dietary dimensions: the unprocessed and minimally processed whole plant foods (Nova-WPF, 33 items) and ultra-processed foods (Nova-UPF, 23 items). The Nova-UPF score, representing the exposure, was calculated as the average of three Nova 24-h screeners. Hypertension incidence was determined via self-reported medical diagnosis. Cox proportional hazards models were applied to examine the association between the Nova-UPF score and hypertension risk, with the fully adjusted model accounting for age, sex, others sociodemographic, health, and lifestyle factors, as well as the Nova-WPF score.

RESULTS

A total of 19,251 participants were included in the analysis, of whom 2,915 had obesity, and all were free of hypertension at baseline. The mean Nova-UPF score was 0.37 (95% CI: 0.36–0.38), 1.32 (95% CI: 1.31–1.33), 2.15 (95% CI: 2.14–2.16), and 3.63 (95% CI: 3.60–3.66), respectively across quartiles. In the fully adjusted model, the hazard ratio (HR) for the highest quartile of Nova-UPF score was 1.52 (95% CI: 1.26–1.84) among participants without obesity and 1.52 (95% CI: 1.11–2.08) among participants with obesity. However, the incidence rate (IR) of hypertension among individuals with obesity (IR: 81.94; 95% CI: 74.49–90.13) was nearly three times higher compared to those without obesity (IR: 28.33; 95% CI: 26.53–30.26).

CONCLUSIONS

The incidence of hypertension is significantly higher among individuals with obesity; however, the association between higher consumption of ultra-processed foods and an increased risk of hypertension persists in both individuals with and without obesity. Therefore, public care policies should prioritize reducing the consumption of ultra-processed foods, especially among this group.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP43_08

MODELLING THE IMPACT OF SUGAR-SWEETENED BEVERAGE TAXES ON THE PRIMARY PREVENTION OF NON-COMMUNICABLE DISEASES

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BACKGROUND AND OBJECTIVES

Non-communicable diseases (NCDs) remain one of the most significant public health challenges globally, accounting for over half of the global burden of disease. SSB taxation has been promoted as an effective globally in reducing consumption, generating revenue, and promoting healthier dietary behaviours. Despite its potential, there are barriers to implementing such a tax – including. limited local data, the absence of localized models to estimate health and economic impacts of the tax intervention, and resistance from the beverage industries. This study aims to estimate the impact of the tax on the incident and prevalent cases of diabetes and diabetes related-healthcare cost savings from the tax.

METHODS

This study used Markov modelling framework to model the potential impact of the tax on diabetes incidence, prevalence, mortality, and healthcare cost averted.

RESULTS

Higher tax passthrough rates, particularly at 120%, drive significant reductions in diabetes-related outcomes-incidence, prevalence, and mortality-while delivering substantial healthcare cost savings over two decades. Among the scenarios analyzed, the retail price base demonstrated the most pronounced impact. At a 120% passthrough rate, cost savings reached $9.1 million for retail pricing and $7.43 million for ex-factory pricing, accompanied by marked declines in disease burden and mortality. In contrast, lower passthrough rates (e.g., 68%) yielded more modest health improvements and, in some cases, increased healthcare costs. These findings underscore the critical importance of implementing tax policies that optimize both public health outcomes and economic returns

CONCLUSIONS

The RESULTS demonstrate that higher tax passthrough rates, particularly at 120%, significantly reduce diabetes incidence, prevalence, and mortality while generating substantial healthcare cost savings. By adopting evidence-based frameworks, SSB taxation can be leveraged to promote health ormobilize resources for public health initiatives.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP43_09

CIRCULATING BRANCHED-CHAIN AMINO ACIDS AND INCIDENCE OF TYPE 2 DIABETES MELLITUS IN MAUCO, A CHILEAN AGRICULTURAL POPULATION-BASED COHORT

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BACKGROUND AND OBJECTIVES

Metabolomics has emerged as a field enabling the identification of circulating biomarkers that allow a better understanding of the causes of Type 2 diabetes (T2DM). Plasma Circulating Branched-Chain Amino Acids (BCAAs) have been repeatedly reported to be associated with cardiometabolic outcomes and T2DM. However, there are no studies in Latin American cohorts. This study aimed to evaluate the association between BCAA plasma profile and the incidence of T2DM in an agricultural cohort of Chilean adults.

METHODS

We followed 1,738 participants of the MAUCO cohort in the agricultural area of Molina (Central Chile) (47% women; aged 38-74 years; free of T2DM). We registered fasting glycemia at baseline and after follow-up. We also determined anthropometry, lifestyle habits, sociodemographic factors, diseases status based on medical records, alcohol consumption, and a Mediterranean diet score. At baseline, we quantified a plasma amino acid profile using the Nightingale metabolomic platform based on nuclear magnetic resonance spectroscopy. Statistical analyses were carried out with RStudio using Cox regression models.

RESULTS

After a 5-year follow-up, 127 new cases of T2DM were diagnosed (7.3%). T2DM incidence was significantly associated with baseline circulating BCAA. The hazard ratio (HR) for T2DM per 1-standard deviation increase (1-SD) of total BCAA was 1.27 (95% CI 1.05-1.54, P=0.014). The HR per 1-SD increase in isoleucine, leucine, and valine were 1.32 (95%CI: 1.10-1.56, P=0,002), 1.28 (95%CI: 1.05-1,57; P=0,012) and 1.23 (95%CI: 1.01-1.49, P=0,038) respectively. Plasma levels of the aromatic amino acid tyrosine were also positively associated with T2DM incidence (HR per 1-SD increase: 1.2; 95%CI: 1.0-1.49, P=0,048). All models were adjusted by sex, body mass index, age, education level, alcohol consumption, physical activity levels, smoking, and Mediterranean diet score (MDS).

CONCLUSIONS

Our epidemiologic research shows that elevated plasma BCAA concentrations were associated with a higher risk of T2DM in Chilean adults. Future directions should explore whether there is an interaction between amino acid profiles and diet on the risk of developing T2DM.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 47 - NON COMMUNICABLE DISEASES

OAP47_01

PRESCRIBING FRESH PRODUCE TO ADDRESS HEALTH EQUITY IN ADULTS WITH TYPE 2 DIABETES AND FOOD INSECURITY

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BACKGROUND AND OBJECTIVES

Background: Type 2 diabetes represents one of the biggest healthcare challenges globally. Healthy eating is integral in the management of type 2 diabetes.1 However, for individuals with food insecurity, affording and accessing the foods recommended is difficult, leading to worse long-term health outcomes.2 Our research team aims to address this health equity issue using a 'Food is medicine' approach where programs, such as Produce Prescription, enable healthcare practitioners to prescribe foods for free as part of healthcare, to prevent, manage and treat diet-related diseases for people with food insecurity.

Objectives: To determine the effect of Produce Prescription on blood glucose control and other health indicators in adults with type 2 diabetes experiencing hyperglycaemia and food insecurity and/or financial hardship in Australia.

METHODS

METHODS: Using a parallel design randomised controlled trial, n=224 participants will be randomised (1:1) to Produce Prescription or usual care. Over 26 weeks, the intervention group will receive a weekly delivery of fruits, vegetables, wholegrains and nuts, and up to 3 sessions with an accredited dietitian. Controls will receive usual care. The primary outcome is change in mean HbA1c over 26 weeks, comparing the intervention and control group. Secondary outcomes include between-group differences at 26 weeks in change in blood pressure, body weight, blood lipids, food and nutrition insecurity, person-reported outcome measures, medication use, and diet quality. Implementation outcomes assessed will include feasibility, acceptability, scalability and cost effectiveness

RESULTS

Recruitment commenced in September 2024, and we anticipate recruitment and follow-up will be completed by December 2026. Preliminary RESULTS available 2025.

CONCLUSIONS

Discussion: This Australia-first Produve Prescription trial will provide novel and rigorous data for an intervention that may be feasible to improve health and health equity as part of the Australian healthcare system. We anticipate Produce Prescription will lead to a clinically meaningful reduction in HbA1c and contribute to improved health equity and long-term health benefits for adults with type 2 diabetes and food insecurity.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP47_02

ASSOCIATION BETWEEN DIETARY PATTERNS AND CVD-RELATED MORTALITY IN THE JAPANESE POPULATION: THE JAPAN MULTI-INSTITUTIONAL COLLABORATIVE COHORT (J-MICC) STUDY

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BACKGROUND AND OBJECTIVES

Dietary patterns affect the risk of cardiovascular disease (CVD). We investigated the associations between dietary patterns and CVD-related mortality in a large-scale general Japanese cohort.

METHODS

Participants of 35,388 men and 46,838 women aged 35-69 years (mean age: 54.6 years) were followed from 2004-2014 to 2022. Dietary patterns were identified through factor analysis of 46 food and beverage items by a semi-quantitative food frequency questionnaire and alcohol consumption. Factor scores were categorized into quintiles (Q1-Q5). Cox proportional hazards models were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs), adjusting for potential confounders.

RESULTS

Over a mean follow-up period of 12.6 years, 4,860 deaths (3,097 men, 1,763 women) were recorded. We identified dietary patterns; “healthy Japanese dietary pattern”, “meat and fried food rich pattern” and “high bread and low rice pattern” in men and women; “fish and shellfish rich pattern” and “high confectioneries and low alcohol pattern” in men; “vegetable rich pattern” and “high alcohol and low rice pattern” in women. The healthy Japanese dietary pattern in men was associated with reduced risks of CVD and atherosclerotic CVD mortality (Q5 versus Q1 HRs [95% CI]: 0.55 [0.40–0.77] and 0.47 [0.27–0.80], P-trend <0.001 and 0.004). Conversely, the fish and shellfish rich pattern in men was associated with atherosclerotic CVD mortality risk (Q5 versus Q1 HR: 1.91 [1.13–3.22], P-trend =0.018).

CONCLUSIONS

Promoting healthy Japanese dietary pattern among men may be effective in reducing CVD mortality, highlighting its potential in preventive health strategies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP47_03

PRENATAL MATERNAL SUPPLEMENTATION WITH PREBIOTICS REGULATES MICROBIOTA COLONIZATION IN HIGH-RISK CHILDREN, BUT DO NOT PREVENT ATOPIC DERMATITIS AT ONE YEAR OF AGE

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BACKGROUND AND OBJECTIVES

Atopic Dermatitis (AD) is the most common atopic disease. AD is associated to the dysfunctions of the immune system and epithelial barriers, with an imbalance in the gut microbiota. These disorders start very early in life and some are present from birth. A primary prevention strategy for atopic diseases should therefore begin during fetal life. Nutritional intervention during pregnancy modulates the gut microbiota and implants a specific microbiota in the newborn. Prebiotics are non-digestible oligosaccharides present in food, which are able to modulate the microbiota by promoting the growth of bacteria beneficial for host health and the immune system by inducing a tolerogenic environment. Our preclinical studies highlighted that maternal prebiotic (GOS/inulin) intake reduced the risk of food allergy in the offspring. We wanted to confirm these data in AD in a clinical trial.

METHODS

PREGRALL (NCT03183440), a randomized placebo controlled trial, evaluated the ability of a GOS/inulin supplementation in 376 allergic pregnant women recruited in 4 French centers to prevent AD in high-risk children at 1-year-of-age (Cabridain et al., 2019). A unique biocollection of blood, stools and breast milk was generated in 126 mother-infant dyads to elucidate the mechanisms involved in AD development as well as the impact of the prebiotics in the mother and their children at 1-year-of age (CIMMAP Project).

RESULTS

The prebiotic supplementation was not able to protect against AD at 1 year or to decrease the severity of the disease. Surprisingly, the prevalence of AD was low compared to our estimations in a population at high risk (20% instead of 45%). Interestingly, the prebiotic intake modulated the composition of the maternal gut microbiota, particularly increasing the Bifidobacteria. This phenotype was transmitted to the children in the first week of life.

CONCLUSIONS

Altogether, prebiotic intake by mothers during pregnancy affects their gut microbiota and the effect is transmitted to their children in early life. The modulation of microbial parameters in mother and their children by the prebiotic intervention was not able to protect against AD at one year of age but encourage us to think that the strategy could have a longer-term effect on the prevention of other atopic diseases.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP47_04

Dietary amino acids and risk of stroke subtypes: RESULTS from three large prospective cohort studies

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BACKGROUND AND OBJECTIVES

Differences in dietary protein have been associated with stroke risk, with possible heterogeneity in associations by stroke type or food sources of protein. We examined the associations of individual dietary amino acids, as the constituents of dietary protein, with risks of ischemic, hemorrhagic and total stroke.

METHODS

We analysed data from 73,830 women in the Nurses' Health Study (1984–2012), 92,333 women in the Nurses' Health Study II (1991–2013), and 43,268 men in the Health Professionals Follow-Up Study (1986–2016). Dietary intakes of 22 (20 standard and two non-standard) amino acids were assessed using validated food frequency questionnaires, administered typically every four years. Multivariable-adjusted Cox regression models were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) of ischemic, hemorrhagic and total stroke in relation to the energy-adjusted intakes of individual amino acids.

RESULTS

During an average follow-up of 23.7 years, 3058 ischemic, 872 hemorrhagic and 5997 total stroke cases were documented. After correction for multiple testing, lower risks of ischemic stroke were observed with higher intakes of glutamine (HR per 1 SD higher: 0.94, 95% CI: 0.90-0.98, *p*-value=0.004) and proline (0.94, 0.90-0.98, *p*-value=0.005). The associations remained directionally consistent across sensitivity analyses, but attenuated upon mutual adjustment. All other amino acids, including branched-chain amino acids, were not significantly associated with ischaemic stroke. For hemorrhagic stroke, no significant associations were observed for any of the amino acids. For total stroke, inverse associations were also observed for both glutamine (0.94, 0.91-0.97, *p*-value<0.001) and proline (0.96, 0.93-0.99, *p*-value=0.004). In terms of dietary sources, glutamine was most strongly correlated with plant protein and whole grains, while proline was most strongly correlated with dairy protein and dairy products.

CONCLUSIONS

Higher intakes of glutamine and proline were associated with lower risks of ischemic and total stroke.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP47_05

DETERMINANTS OF ADHERENCE TO GLUTEN-FREE DIET IN CHILDREN WITH CELIAC DISEASE AND THE IMPACT OF DIETICIAN COUNSELING IN IMPROVING ADHERENCE

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BACKGROUND AND OBJECTIVES

Adherence to a gluten-free diet (GFD) is the mainstay of management of celiac disease (CD), but data on factors determining long-term adherence to GFD in children with CD is limited. Here, we aimed to compare serology, Dietician detailed interview [DDI] and various questionnaires (Biagi, modified Leffler) to assess GFD adherence and to identify determinants of GFD adherence.

METHODS

In this prospective study, consecutive children with CD on GFD and <18 years, were enrolled between November 2022 and May 2024.GFD adherence was assessed by serology (anti-tissue transglutaminase -IgA [tTG-IgA]), DDI and two questionnaires

RESULTS

Total 103 children (64 boys [62%], median age 8 years [IQR 4-12.5]) on GFD (median duration 35 months [IQR 11-52]) were enrolled. Concordance between DDI and Biagi questionnaire was fair (cohen's kappa [k]0.38) while it was good between DDI and modified Leffler questionnaire(Cohen's kappa 0.49). The concordance between serology and other METHODS of adherence assessment (DDI [k=0.11], Biagi [k=0.19] and modified Leffler [k=0.17]) was poor. Adherence as assessed by serology, DDI, Biagi score and modified Leffler score were 73.8%, 48.5%, 66.2 %, and 60.3%, respectively (figure 1). Upon regression analysis, having a sibling with CD, higher parenteral knowledge about CD were found to positively influence adherence while age>10 years and longer duration of follow-up negatively influenced adherence (table 1). Adherence by modified Leffler score (26.4% vs 72.7%, p<0.001), DDI (28% vs 68.4%, p<0.001), Biagi score (36.4% vs 70%, p= 0.046) were significantly higher in the positive serology group compared to the negative serology. After dietary counseling, GFD adherence improved in follow-up (p<0.05 in all).

CONCLUSIONS

Sibling with CD, associated T1DM, greater parental awareness about CD positively and older age negatively influenced GFD-adherence

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP47_06

IS HIGH INTAKE OF ULTRA-PROCESSED FOOD RELATED TO ADIPOSITY OR CARDIOMETABOLIC RISK FACTORS IN CHILDREN? A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

Ultra-processed foods (UPF) is by the NOVA framework a broad category of foods with both potentially positive and negative impact on dietary quality and health. These disparate health effects may be especially pronounced in children, but little is known of UPF intake of Swedish children. The aim was to study associations between UPF intake, including subtypes of UPF, with cardiometabolic risk factors and adiposity in Swedish children.

METHODS

This cross-sectional study was conducted in 8-year-old children (N=167) born within a population-based mother- and child cohort. Women were recruited during pregnancy and the children were followed up at age 8. The children's diet was assessed through a questionnaire. UPF was defined according to NOVA, and UPF items were classified into subtypes of UPF: bread/cereals, proteins/dishes, beverages, sweets/snacks. High intake was defined as servings/day ≥ energy adjusted median. Cardiometabolic risk factors included measurements of lipoproteins in non-fasting venous blood samples, blood pressure and anthropometry (waist circumference, BMI and fat mass assessed by bioimpedance). Associations between UPF intake (total and subtypes) and the cardiometabolic risk factors were assessed using linear regression analysis, adjusted for confounders.

RESULTS

Mean±SD intake of UPF was 6.1±2.1 servings/day. The largest single contributor to energy among UPF subgroups was bread, which constituted more than half (56%) of the UPF intake. High UPF intake was associated with higher BMI (β [95% CI]) (0.575 [0.057 – 1.094] kg/m2), larger waist circumference (1.301 [0.024-2.579] cm), lower LDL cholesterol (-0.207 [-0.398 – -0.016] mmol/L) and lower ApoB:ApoA1 ratio (-0.050 [-0.088 – -0.013]). Analyses of UPF subtypes showed that associations between high UPF intake and adiposity were driven by intake of UPF beverages and UPF sweets/snacks. High intake of UPF proteins/dishes was associated with lower LDL cholesterol and lower ApoB:ApoA1 ratio.

CONCLUSIONS

The observed detrimental associations between high UPF intake and measures of adiposity in children could be ascribed to intake of UPF beverages, sweets and snacks, i.e. foods already discouraged in existing dietary recommendations. High intake of UPF was also associated with improved lipid profile. More research is needed to clarify the health effects of UPF.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP47_07

Contaminants from Food processing and packaging and their association with Cardiovascular Disease Risk – RESULTS from a large French prospective cohort

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BACKGROUND AND OBJECTIVES

The food items we consume are contaminated by several substances (Polycyclic aromatic hydrocarbons – PAHs, Perfluorinated compounds, etc.) throughout their processing, packaging and cooking. However, the long-term implications of these contaminants on cardiovascular health remain unclear. This study aims to investigate the associations between exposure to contaminants originating from food processing and food packaging and the risk of cardiovascular diseases (CVD) in the NutriNet-Santé cohort.

METHODS

Anthropometric, socio-demographic, physical activity and health data of 108,923 participants (79.3% women, mean age=42.4 years, SD=14.5) aged above 15 years old were collected from the French prospective cohort NutriNet-Santé (2009-2024). We assessed dietary intakes using repeated 24h-dietary records and exposures to food contaminants (PAHs, per- and polyfluoroalkyl substances – PFAS, Furans, Brominated Flame Retardants) using food composition databases and quantitative analysis from the total diet study (TDS/EAT 2) led by the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) between 2006 and 2009. We characterised associations between exposures to these contaminants (three categories: sex-specific tertiles or non-exposed/lower/higher exposed participants separated by the sex-specific median) and risk of CVD using multivariable proportional hazards Cox models adjusted for known risk factors.

RESULTS

During a median follow-up time of 7.92 years, 2,397 cases of CVD were ascertained. Higher dietary exposures to PAHs were associated with a higher risk of CVD, particularly for benz[a]anthracene (HR T3 versus T1= 1.18, 95% CI [1.06-1.32], p-trend = 0.003), phenanthrene (HR T3 versus T1= 1.14, 95% CI [1.02-1.29], p-trend = 0.02) and fluoranthene (HR T3 versus T1= 1.15, 95% CI [1.02-1.30], p-trend = 0.02). Among the PFAS, perfluorodecanoic acid (PFDA) stands out by being associated with a higher risk of CVD (HR T3 versus T1= 1.12, 95% CI [1.01-1.23], p-trend = 0.03).

CONCLUSIONS

This large prospective cohort study suggests a potential role for food contaminants such as PAHs and PFAS, known as “forever chemicals”, in CVD etiology, which is consistent with their metabolic disrupting potential suggested by previous in vivo/in vitro studies. Our findings need to be replicated in other epidemiological studies and the underlying mechanisms need to be elucidated in experimental studies. If confirmed, these elements advocate for stronger regulations on these food contaminants.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP47_08

GENDER DISPARITIES IN WELL-BEING AMONG PERSONS WITH NON-COMMUNICABLE DISEASES: THE ROLE OF SOCIAL CAPITAL AND GRANTS

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BACKGROUND AND OBJECTIVES

This study explores how non-communicable diseases (NCDs), social capital, and government subsidies/grants influence subjective well-being (SWB) among individuals aged 40 and older in rural South Africa. Understanding gender differences in these relationships provides insights for improving public health interventions in resource-constrained settings.

METHODS

We analyzed data from 2,432 participants in the HAALSI study to identify factors influencing SWB through regression analysis. Covariates such as age, education, marital status, employment, wealth, religion, social capital, and household grants were included. Interaction effects between NCDs, social capital, and grants were assessed, with gender-specific analyses to explore disparities.

RESULTS

NCDs had a significant negative impact on SWB ($\beta = -0.855$, $p < 0.01$), with a more pronounced effect observed among women ($\beta = -0.914$, $p < 0.01$) compared to men ($\beta = -0.778$, $p < 0.01$). Factors such as age, education, marital status, and wealth also influenced SWB, with older individuals (80+ years) experiencing greater declines ($\beta = -1.215$, $p < 0.01$). Secondary education was associated with improved SWB among women ($\beta = 0.544$, $p < 0.01$), while marriage significantly benefited men's SWB. The negative impact of NCDs was exacerbated by low social capital and low social grants, with men showing greater sensitivity to social capital deficits ($\beta = -1.041$, $p < 0.001$). High social grants partially mitigated these declines, particularly for women.

CONCLUSIONS

NCDs significantly reduce SWB, with gender-specific patterns linked to social capital and social grants. Public health strategies should prioritize social support, gender-sensitive frameworks, and equitable resource allocation to improve well-being in rural populations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP47_09

COMPARING THE PREVALENCE OF OBESITY AND ABDOMINAL OBESITY ACROSS TWO COHORTS IN DIFFERENT STAGES OF NUTRITIONAL AND EPIDEMIOLOGICAL TRANSITION

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BACKGROUND AND OBJECTIVES

Obesity is a key risk factor for cardiovascular and metabolic diseases. In recent decades, Chile has undergone a significant nutritional and epidemiological transition, marked by rising obesity rates and associated comorbidities, largely due to Westernized dietary patterns and reduced physical activity. This study aims to compare the prevalence of obesity and abdominal obesity in two cohorts living in the same location, but at different stages of nutritional and epidemiological transition.

METHODS

This is a population-based cohort study included individuals from urban and rural areas. The study sample consisted of 1,985 participants (aged 22 to 28 years) from two birth cohorts: cohort 1 (born 1974–1978) and cohort 2 (born 1988–1992). Obesity was defined as a Body Mass Index (BMI) ≥ 30, and abdominal obesity as a Waist Circumference (WC) ≥ 80 cm for women or ≥ 94 cm for men. Multivariable logistic regression was used to analyze the data.

RESULTS

The mean age of participants was 24.7 ± 1.60 years, with 56.3% identifying as women. The median BMI was 25.6 kg/m² (IQR: 22.6–28.7). Overall, 20.0% of participants had obesity, and 45.2% had abdominal obesity. The prevalence of both obesity and abdominal obesity was significantly higher in cohort 2. Specifically, 15.2% of cohort 1 had obesity compared to 27.0% in cohort 2, and 37.4% of cohort 1 had abdominal obesity compared to 53.2% in cohort 2.Sex differences were observed, with women having higher prevalence rates: 22.6% of women were obese, compared to 18.7% of men; and 59.4% of women had abdominal obesity, compared to 26.6% of men.Additionally, individuals with lower incomes had higher rates of obesity (26.7%) and abdominal obesity (52.6%) compared to those with higher incomes ($p<0.05$).At the same age, individuals from cohort 2 were more likely to be obese (adjusted odds ratio [AOR]: 2.23; 95% CI: 1.76–2.81) and have abdominal obesity (AOR: 2.10; 95% CI: 1.72–2.55), after adjusting for sex and income.

CONCLUSIONS

Our findings suggest that the transition to a more Westernized diet and lifestyle—experienced during early life in cohort 2—may contribute to the higher prevalence of obesity and abdominal obesity observed in this cohort. This highlights the potential long-term impacts of nutritional and epidemiological transitions on public health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 58 - NON COMMUNICABLE DISEASES

OAP58_01

ASSESSING THE POTENTIAL IMPACT OF SALT REFORMULATION ON NON-DISCRETIONARY DIETARY SALT INTAKES IN IRISH ADULTS

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BACKGROUND AND OBJECTIVES

Annually 1.89 million deaths globally are associated with excessive salt intake (1). To date, salt reduction policies have been more effective in preventing diet-related diseases than interventions targeting sugar and saturated fat (2). The World Health Organization (WHO) has set a salt intake threshold of 5g/d to prevent diet-related noncommunicable diseases (3). In Ireland, where dietary salt intakes exceed this threshold (4), the Food Reformulation Roadmap (5) aims to reduce salt by 10% in 25 priority food categories (6). The aim of this study was to model the potential impact of this salt reduction in the 25 priority food categories on dietary salt intakes in Irish adults.

METHODS

Foods contributing to salt intake in each priority food category were identified in the National Adult Nutrition Survey II (NANSII; 2021–2022) which involved 1000 Irish adults aged 19–92 years (4). Salt content per 100g of each food item was determined and reduced by 10%. Using these reduced salt amounts, and the weight of the food consumed, the reformulated amount of salt consumed was calculated. The mean daily intake (MDI) of dietary salt for each participant before and after the 10% salt reduction was calculated. Paired t-tests were conducted in SPSS (version 29) to identify differences in the MDI of salt owing to the 10% salt reduction.

RESULTS

Prior to the 10% salt reduction, the MDI of salt was 5.6g/d and 4.4g/d for males and females, respectively. After the 10% salt reduction in the 25 priority food categories, the MDI of salt significantly decreased to 5.2g/d for males (p<0.001) and 4.1g/d for females (p<0.001). Among males aged 19–64 years, the MDI of salt significantly decreased from 6.0g/d to 5.5g/d (p<0.001), and for those ≥65 years, from 4.8g/d to 4.4g/d (p<0.001). For females aged 19–64 years, the MDI of salt significantly decreased from 4.7g/d to 4.3g/d (p<0.001), and for those ≥65 years, from 3.7g/d to 3.5g/d (p<0.001).

CONCLUSIONS

In this best-case scenario for a 10% salt reduction in priority food categories, the MDI of salt decreased in all sex/age-groups examined. However, the MDI of salt remained above the WHO salt intake threshold in younger male adults and when coupled with discretionary salt, total salt intake would be considerably higher. These findings contribute towards the evidence base for future salt reduction policies, demonstrating additional reformulation of prepacked foods is required alongside reduction in discretionary salt use.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP58_02

PROSPECTIVE ASSOCIATIONS OF ANXIETY, INSOMNIA, AND THEIR COMORBIDITY WITH INCIDENT OBESITY IN FRENCH MEN AND WOMEN FROM THE GENERAL POPULATION

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BACKGROUND AND OBJECTIVES

Sleep disorders and, to a lesser extent, anxiety disorders, have been studied independently for their association with obesity. However, these mental disorders are highly comorbid. This study assessed the prospective associations of anxiety, insomnia, and anxiety-insomnia comorbidity with obesity risk in general-population adults.

METHODS

Participants in the ongoing NutriNet-Santé cohort were eligible for this analysis if: 1) they had trait anxiety data (Spielberger's State-Trait Anxiety Inventory, STAI-T, administered in 2013-2016); 2) they had chronic insomnia data (sleep questionnaire administered in 2014); 3) they did not have obesity at baseline; 4) they had body mass index (BMI) data up to 2024. Participants were assigned to one of four baseline morbidity groups: neither anxiety nor insomnia (reference), high trait anxiety only (STAI-T ≥40), chronic insomnia only, comorbid anxiety and insomnia. The associations between each of these morbidity groups and incident obesity (BMI ≥30 kg/m²) were assessed with Cox proportional hazards models with age as the time-scale and adjustment for sociodemographic (sex, education, employment, etc.) and lifestyle (diet, physical activity, sedentary behavior, smoking, etc.) confounders.

RESULTS

N= 23 797 (mean baseline age = 55.5 ± 12.7 years; 72% women) were included in the analysis. The mean follow-up duration was 6.2 ± 2.0 years. Among men and women, 21% and 29% had anxiety alone, 6% and 8% had chronic insomnia alone, and 7% and 14% had both conditions, respectively. After controlling for many potential confounders, a statistically significant association between anxiety-insomnia comorbidity and incident obesity was found in men but not in women (men: n = 207 obesity cases; HR = 1.71; 95% CI: 1.06-2.76; women: n = 526 obesity cases; HR = 1.00; 95% CI: 0.77-1.30). No significant associations were observed between insomnia alone or anxiety alone and incident obesity.

CONCLUSIONS

This large prospective study advances knowledge about multimorbidity by demonstrating a prospective association between anxiety-insomnia comorbidity and increased risk of new-onset obesity, especially in men. Future prospective studies in different populations could replicate these findings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP58_03

CLINICAL CHARACTERISTICS OF PATIENTS WITH OBESITY SECONDARY TO DIFFERENT MC4R PATHWAY DISEASES AND 1-YEAR RESPONSE TO SETMELANOTIDE

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BACKGROUND AND OBJECTIVES

Impaired MC4R pathway signaling in patients with hypothalamic obesity (HO), or with deficiencies of proopiomelanocortin (POMC), proprotein convertase subtilisin/kexin type 1 (PCSK1) or leptin receptor (LEPR), and also Bardet-Biedl syndrome (BBS) can cause hyperphagia and severe obesity. The MC4R agonist setmelanotide has demonstrated clinically meaningful weight and hunger reduction in these populations. The weight trajectories of individual patients across these distinct populations stratified by weight category are presented.

METHODS

Patients aged ≥6 years from 4 index clinical trials and a long-term extension trial of setmelanotide who had on-treatment measurements at both baseline and 1 year were included. Changes in body mass index (BMI) and percent of the 95th BMI percentile (%BMI95) from index trial baseline to 1 year of setmelanotide were assessed and stratified by weight categories. Changes in BMI z-score at 1 year in pediatric patients were also assessed.

RESULTS

In total, 58 patients were analyzed (HO: n=12; POMC deficiency: n=9; LEPR deficiency: n=11; BBS: n=26). Most patients had class III extreme obesity at baseline (HO: 67%; POMC deficiency: 44%; LEPR deficiency: 82%; BBS: 77%). After 1 year of setmelanotide, improvements of ≥1 obesity class were observed across all cohorts (HO: 92%; POMC deficiency: 89%; LEPR deficiency: 57%; BBS: 42%). For HO and POMC deficiency, the weight category in 5 patients for each improved from obesity to overweight, and the weight category in 3 patients for each improved from obesity to healthy weight. The baseline BMI of patients with LEPR deficiency and BBS was extremely high and showed marked improvements following treatment, with clinically meaningful BMI reduction in adults (range, −8.3% to −9.5%) and reduction in BMI z-score in pediatric patients (range, −0.28 to −0.35).

CONCLUSIONS

In distinct patient populations with obesity, setmelanotide generally reduced body weight and improved weight category, albeit with differing intensity, which may be due to the variable mechanisms and location of MC4R pathway dysfunction.

CONFLICTS OF INTERESTS

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ALCOHOL CONSUMPTION, SMOKING AND THEIR SYNERGY AS RISK FACTORS FOR INCIDENT TYPE 2 DIABETES

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BACKGROUND AND OBJECTIVES
Smoking has been independently related to an increased risk of type 2 diabetes (T2D). However, controversial RESULTS have been reported for the association between alcohol and T2D onset, while the joint exposure to tobacco and alcohol use has not been explored. Here, we investigated the association of individual and combined tobacco-alcohol exposure with T2D risk.
METHODS

Participants in the NutriNet-Santé web-based cohort (2009-2023) who were free of T2D and had data on alcohol consumption and smoking habits at enrollment were included in these prospective analyses (N = 110,076; mean age 42.9±14.6 years, 79.2% women). Multivariable Cox regression models were fitted to explore the relationships of alcohol consumption (<2 portions/day *vs*. ≥2 portions/day, <10 portions/week *vs*. ≥10 portions/week, and as grams (g) of ethanol/day), tobacco use (never *vs.* former/current smoker), and the combined effect of smoking-alcohol consumption with risk of T2D.

RESULTS

During a median follow-up of 7.5 years (820,470 person-years), 1,175 incident T2D cases were identified. In the fully-adjusted models, no significant differences in T2D risk were detected among categories of alcohol consumption or by alcohol intake (g/day). Compared to never-smokers, former/current smokers showed an increased risk for T2D (HR: 1.36; 1.20 - 1.53). An increased risk of T2D was observed for heavy smokers compared to light/moderate smokers (HR: 2.10; 1.46 – 3.02). Being a former/current smoker with an alcohol consumption ≥10 portions/week was not associated with a higher risk of T2D (HR: 1.11;0.95 – 1.29) compared to having one or neither of these exposures.

CONCLUSIONS

These findings support smoking as an independent risk factor for T2D, and showed that alcohol consumption does not confer any protection against T2D risk. The combined effect of alcohol and tobacco use on T2D risk, and the mechanisms behind this relationship should be further explored.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP58_05

THE SULFUR MICROBIAL DIET AND DEMENTIA RISK: INSIGHTS FROM A LARGE-SCALE POPULATION-BASED PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES

Hydrogen sulfide (H2S) produced by gut microbiota has been linked to metabolic disorders, potentially increasing the risk of dementia. However, current evidence remains limited partly due to the high costs of large-scale laboratory studies. To address this gap, we employed the Sulfur Microbial Diet (SMD) score, a novel dietary index based on 43 gut sulfur-metabolizing bacteria, to approximate intestinal H2S production. This study explored the association between this index and incident dementia, as well as potential disease pathways.

METHODS

We analyzed 124,435 participants with at least two 24-hour dietary recalls from the UK Biobank. SMD scores were calculated by summing the products of the β-coefficients and corresponding food serving sizes. Dementia cases, including Alzheimer's disease (AD), vascular dementia (VD), and frontotemporal dementia (FTD), were identified through hospital and death records. Cox proportional hazard models estimated adjusted hazard ratios (HRs) and 95% confidence intervals (CIs), while restricted cubic splines assessed dose-response relationships. Mediation analyses examined five chronic diseases and fourteen serum biomarkers as potential mediators. Stratified analyses were conducted by baseline age, sex, body mass index, and *ApoE ε4* status. Partial correlation coefficients evaluated links between SMD scores and regional grey matter volume changes.

RESULTS

Over a median follow-up of 8.58 years, 676 incident dementia cases were documented. After adjusting for covariates, a U-shaped relationship was observed between SMD scores and risks of dementia and AD. Compared to the middle quintile, the highest quintile group exhibited significantly higher risks of dementia (HR = 1.37, 95% CI: 1.07–1.74) and AD (HR = 1.60, 95% CI: 1.08–2.37), with no significant associations in other quintiles. Diabetes (dementia: 18%; AD: 4%) and hypertension (dementia: 10%; AD: 5%) partially mediated these associations. No significant association was found between SMD scores and VD or FTD. Male sex and older age amplified the impacts of SMD scores on dementia and AD (both p-interaction < 0.05). Positive correlations between SMD scores and decreases in certain regional grey matter volumes were observed but lost significance after multiple testing corrections. Sensitivity analyses yielded consistent RESULTS.

CONCLUSIONS

Our findings suggest a non-linear relationship between gut-derived H2S and risks of dementia and AD, underscoring the adverse effects of excessive H2S. Further studies are warranted to clarify underlying mechanisms and strengthen dietary recommendations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP58_06

THE ROLE AND MECHANISM OF HYODEOXYCHOLIC ACID INHIBITED COLORECTAL TUMORS VIA OMICS ANALYSIS

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BACKGROUND AND OBJECTIVES

Studies have shown that obesity contributes to colorectal tumors. Hyodeoxycholic acid has been found to have a therapeutic effect on obesity-related diseases such as NAFLD. However, there are still no studies revealing whether HDCA has effects on tumors, which may suggest new uses for HDCA.

METHODS

C57BL/6 mice fed with high-fat diet supplemented with 0.5% HDCA were injected MC38 cells subcutaneously to construct the subcutaneous metastasis model of colorectal tumors. The trend of body weight and tumor volume were evaluated, and blood metabolism and gut microbiota sequencing were analyzed.

RESULTS

Compared with HFD-fed mice, HDCA-intervened mice had lower body weights and higher fecal HDCA and taurohyodeoxycholic acid levels. After tumor inoculation, the intervened mice had smaller subcutaneous tumor volumes, higher HDCA and THDCA levels in faeces and blood. Blood metabolomics revealed significant enrichment in pathways of bile secretion, arachidonic acid metabolism, primary bile acid metabolism, taurine and hypotaurine metabolism. Analysis of gut microbiota at the completion of obesity modeling revealed the α diversity, the Chao1 index, being lower in the HDCA-intervened mice. The relative abundance of a total of 9 genera were significantly higher and 18 genera were lower. The KEGG RESULTS indicated significant upregulation of 9 metabolic pathways and downregulation of 16 metabolic pathways.

CONCLUSIONS

HDCA intake ameliorates HFD-induced obesity phenotype, inhibiting colorectal tumor growth in mice, and decreases the abundance of gut microbiota. Gut microbiota affected by HDCA may participate in metabolism-related effects through the circulation, which might be one way how HDCA affects colorectal tumors.

CONFLICTS OF INTERESTS

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SELF-WEIGHING AND DISORDERED EATING AMONG WOMEN: EXPLORING THE MODERATING ROLE OF PSYCHOLOGICAL RESILIENCE AND SELF-COMPASSION

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BACKGROUND AND OBJECTIVES

Disordered eating behaviours are a significant concern, particularly among women, due to societal pressures related to body image and weight. While self-weighing is often used as a weight management strategy, its psychological effects remain controversial. This study aims to explore the moderating roles of psychological resilience and self-compassion in the relationship between self-weighing frequency and disordered eating behaviours.

METHODS

This cross-sectional study was conducted on 372 women (mean age = 29.27, SD = 7.24). Participants completed a face-to-face questionnaire, including the Self-Compassion Scale, Connor-Davidson Psychological Resilience Scale (CD-RISC), Three-Factor Eating Questionnaire (TFEQ-R21), and a measure of self-weighing frequency. Age and BMI were controlled for in the analyses. Moderated regression analyses were conducted using Model 1 of PROCESS v3.3.

RESULTS

Four significant moderations were identified. The tenacity and competence dimension of psychological resilience moderated the relationship between self-weighing and cognitive restriction ($\Delta R2 = 0.019$, $p = 0.006$). This relationship was positive for participants with low tenacity and competence but was not significant for those with high levels. Total psychological resilience moderated this relationship ($\Delta R2 = 0.015$, $p = 0.016$), with a positive association for those with low resilience. Self-kindness, a sub-dimension of self-compassion, moderated the relationship ($\Delta R2 = 0.015$, $p = 0.014$), with a stronger association for those with low self-kindness. Lastly, total self-compassion moderated the association ($\Delta R2 = 0.011$, $p = 0.042$), with a stronger positive relationship for those with low self-compassion.

CONCLUSIONS

Psychological resilience and self-compassion buffer the impact of self-weighing on cognitive restriction. Women with higher resilience and self-compassion are less affected by the negative effects of frequent self-weighing on disordered eating behaviours. These findings highlight the value of promoting psychological resources like resilience and self-compassion in interventions targeting disordered eating.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP58_08

REPLACEMENT OF ANIMAL WITH PLANT PROTEIN FOODS REDUCES BLOOD PRESSURE IN INDIVIDUALS WITH PREHYPERTENSION OR HYPERTENSION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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BACKGROUND AND OBJECTIVES

Hypertension remains the top modifiable risk factor for cardiovascular diseases (CVD), the leading cause of global mortality. While diet and lifestyle modification are the cornerstone of hypertension prevention and management, with public health and clinical practice guidelines recommending a shift to plant-based diets, the specific role of replacing animal with plant protein foods on blood pressure (BP) in the context of these diets is unclear. We assessed the effect of this dietary replacement in those with prehypertension or hypertension in a systematic review and meta-analysis of randomized controlled trials (RCTs).

METHODS

MEDLINE, Embase, and Cochrane Library were searched through March 2024 for RCTs ≥3 weeks. Systolic and diastolic BP (primary outcomes) data were extracted by two independent reviewers. Random-effect models were used to estimate pooled mean differences and 95% confidence intervals (CI). Heterogeneity was assessed and quantified using Cochran Q and I^2 statistics. The certainty of evidence was evaluated using GRADE.

RESULTS

The analysis included 7 RCTs, comprising 8 trial comparisons (n=635). Intervention arms featured soy protein powders (n=4) and soy-based foods (n=4) as substitutes for milk protein powder (n=4), animal meat (n=2), and dairy products (n=2). Replacing animal with plant protein foods reduced systolic BP by 4.33 mmHg (95% CI -8.41 to -0.26 mmHg) and diastolic BP by 2.35 mmHg (95% CI -4.50 to -0.21 mmHg), with substantial heterogeneity (I^2=88.94% and 83.75%, respectively, PQ<0.001). Subgroup analyses showed influence by food matrix in both systolic and diastolic BP (P=0.004 and P=0.029, respectively), with whole foods' replacement showing greater reductions in systolic BP (-9.54 mmHg, 95% CI -16.82 to -2.26) and diastolic BP (-4.75 mmHg, 95% CI -8.90 to -0.60). GRADE was moderate owing to downgrades for inconsistency.

CONCLUSIONS

Available evidence suggests that replacing animal with plant protein foods, especially soy-based products, leads to moderate reductions in BP in those with prehypertension or hypertension. This appears to be restricted to the displacement of whole foods. These findings support public health and clinical practice guidelines recommending plant-based dietary patterns for hypertension prevention and management (ClinicalTrials.gov: NCT02037321).

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CONFLICTS OF INTERESTS

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OAP58_09

ADIPOSE AND BLOOD DNA METHYLOME OF SOUTH ASIAN INDIANS WITH TYPE 2 DIABETES MELLITUS: RELATIONS WITH GLYCEMIC CONTROL

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BACKGROUND AND OBJECTIVES

Adipose *de novo* lipogenesis (*DNL*) preserves insulin sensitivity. This study aims to unravel the epigenetic control of adipose *DNL* in South Asian Indians with type 2 diabetes mellitus (T2DM).

METHODS

Adult normal glucose tolerance (NGT, n=35) and T2DM (n=33) subjects undergoing laparoscopic surgeries for their clinical complications (gall stone, hernia, appendicitis, pancreatitis, splenic cyst, Achalasia cardia) were recruited with written, informed consent. Omental adipose tissue (AT) and fasting venous blood samples was collected and appropriately stored. Epigenome-wide DNA methylation analysis of AT and peripheral blood mononuclear cells (PBMCs) was conducted using Illumina EPIC v2 kit on Illumina iScan instrument. Data was analysed using the ChAMP (v2.29.1) package in R statistical software (v4.4).

RESULTS

The NGT (females: 19, males: 16) and T2DM (females: 20, males: 13) subjects were similar in age (48.6 ± 6.0 and 48.2 ± 6.9 years, respectively, $P = 0.805$) and BMI (27.3 ± 4.5 and 29.1 ± 6.2 kg/m2, respectively, $P = 0.180$). 2356 (False Discovery Rate, FDR corrected $P<0.05$) and 17 (Bonferroni corrected $P<0.05$) differentially methylated probes (DMP) across both sexes in NGT and T2DM subjects in AT and PBMC were identified. Multiple DMPs in *PEG10* and *CCHCR1* were hypermethylated in T2DM across both tissue and sex; except for cg00628211 in *CCHCR1* (hypomethylated in male AT).

CONCLUSIONS

PEG10 and *CCHCR1* were hypermethylated in T2DM AT and PBMCs; except for one hypomethylated *CCHCR1* CpG in male T2DM AT. CCHCR1 is reported to be involved in mRNA metabolism. PEG10 plays a crucial role in early adipocyte differentiation. Their role in glycemic control and maintenance of metabolic homeostasis has not yet been investigated. This is the first epigenome-wide analysis of DNA methylation in AT and PBMCs from South Asian Indian subjects with T2DM. Findings from this study are providing valuable leads for identification of adipose-specific druggable molecular pathways in T2DM.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 63 - NON COMMUNICABLE DISEASES

OAP63_01

ASSOCIATION OF NOVEL DIETARY AND LIFESTYLE INFLAMMATION SCORES WITH INCIDENCE OF CARDIOVASCULAR DISEASES AND HEART FAILURE IN MIDDLE-LATE ADULTHOOD

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BACKGROUND AND OBJECTIVES

We investigated the associations of novel dietary and lifestyle inflammation scores (DIS and LIS) with the incidence of all cardiovascular disease (CVD) events, its different subtypes, including hard CVD, stroke, myocardial infarction (MI), as well as heart failure (HF).

METHODS

We analyzed data from 5866 participants aged ≥45 years from the Multi-Ethnic Study of Atherosclerosis (MESA). DIS and LIS were constructed using food frequency and lifestyle questionnaire data. Multivariable Cox regression models were used to estimate the hazard ratios (HRs) and 95% confidence intervals (95% CIs) of DIS and LIS for CVD outcomes.

RESULTS

Over 14 years, there were 822, 600, 290, 252, and 270 events of all CVD, hard CVD, HF, stroke, and MI, respectively. The highest DIS quintile was associated with an elevated risk of all CVD (HR: 1.28; 95% CI: 1.02-1.61; P-trend=0.067) and hard CVD events (1.47; 1.12-1.92; P-trend=0.013). Additionally, each one-point increase in DIS was associated with a 6% higher MI risk (95% CI: 1.01-1.12). The impact of DIS on all CVD events was more pronounced among overweight participants compared to normal weight or obese counterparts (P-interaction <0.001). Each one-point increase in LIS was associated with a 36% higher HF risk (95% CI: 1.14-1.62). Furthermore, individuals in the highest LIS quintile had a 75% higher risk of HF, compared to those in the lowest quintile (95% CI: 1.18-2.59).

CONCLUSIONS

Diet and lifestyle, through their contributions to inflammation, may be associated with higher risk of CVD, particularly for hard CVD, MI, and HF.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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directly associated with all-cause, all-cancer, and all-cardiovascular disease mortality risks among women. The Journal of nutrition 2021;151:930-939.

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OAP63_02

ASSOCIATION BETWEEN MINDFUL EATING AND WEIGHT STATUS IN A FRENCH COHORT

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BACKGROUND AND OBJECTIVES

Mindful eating (ME) can be globally defined as paying attention to the eating experience with all the senses, and witnessing the emotional and physical reactions that occur before, during, and after the eating experience without judgment or reaction. This holistic approach to eating may offer a promising alternative to traditional weight management strategies, such as cognitive restraint. However, the relationship between ME and weight status remains underexplored. This cross-sectional study aimed to investigate the association between ME and body mass index (BMI) in a large French population sample and to compare psychological and dietary behavior characteristics across different ME and BMI categories.

METHODS

In 2023, 26,718 participants from a large French web-based cohort study completed the Mind-Eat Scale, which assesses total ME (range: 1-5), and its six sub-dimensions. Height and weight were self-reported. Multivariable logistic regressions were performed to analyze the association between ME (independent variable) and 6 BMI categories (dependent variable). ANCOVA and logistic regression analyses were conducted to compare individual characteristics based on ME level (≤3.32 vs >3.32, median) and weight status (underweight, normal weight, overweight). All analyses were adjusted for socio-demographic and lifestyle characteristics.

RESULTS

Participants were 60.48 ± 13.81 years (74% female) with a mean ME score of 3.32 ± 0.53. Higher ME scores were associated with lower odds of being in the overweight category (excluding obesity) (OR = 0.43; 95% CI: 0.40–0.46), obesity category I (OR = 0.26; 95% CI: 0.24–0.29), or obesity categories II and III (OR = 0.20; 95% CI: 0.17–0.23). Conversely, higher ME scores were linked to greater odds of being in underweight category I (OR = 2.05; 95% CI: 1.80–2.34) or category II (OR = 1.43; 95% CI: 1.16–1.78). Underweight individuals with high ME levels exhibited healthier psychological and dietary behavior characteristics compared to underweight, normal-weight, and overweight individuals with low ME levels.

CONCLUSIONS

ME was associated with lower levels of overweight and obesity suggesting its potential as a preventive tool for these conditions. However, ME was also linked to higher levels of underweight, which was characterized by healthier psychological traits and eating behaviors. Further longitudinal and interventional studies are needed to better understand the relationship between ME and weight status.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP63_03

CONSUMPTION OF DIFFERENT POTATO PREPARATIONS AND WEIGHT CHANGE IN THE EUROPEAN PROSPECTIVE INVESTIGATION INTO CANCER AND NUTRITION (EPIC) STUDY

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BACKGROUND AND OBJECTIVES
Potatoes are one of the most important global staple foods, but few studies have examined associations between potato consumption and health outcomes. Studies considering preparation METHODS and employing substitution analyses are lacking. We therefore studied the association between different types of potato preparation and weight change in participants from seven countries in the EPIC-study.
METHODS
We included 289,523 participants who provided sufficient detail on potato preparation METHODS to classify potatoes into boiled (including mashed), fried (including roasted), and French fries, and had available repeated measurements on weight. We used multivariable linear regression and performed substitution analyses using the leave-one-out method to explore associations with weight change. Potatoes were substituted with vegetables and legumes; bread; or rice and pasta. Five-year weight change was calculated as (follow-up weight minus baseline weight/time (years))*5. RESULTS were adjusted for age, sex, centre, all other food groups, baseline weight, BMI, education, physical activity, marital status, and smoking status.
RESULTS

The mean (SD) age at baseline was 52.5 (9.1) years, and the mean time between baseline and follow-up weight assessment was 7.5 (3.5) years. The mean (SD) baseline daily intake of boiled potatoes, fried potatoes, and French fries was 64 (61) g, 5 (10) g, and 14 (23) g, respectively. The mean (SD) weight change was 0.7 (4.3) kg/5 years. No association between intake of boiled potatoes and weight change was observed. A 1-SD higher consumption of French fries and fried potatoes was associated with an additional weight gain of 40 g (95% CI: 10;60 g)/5 years and 50 g (95% CI: 30;70 g)/5 years, respectively. Substitution of 1-SD of fried potatoes with bread was associated with 60 g (95% CI: -70;-40) less weight gain over 5 years. Replacing 1-SD of French fries with an equal amount of rice and pasta was associated with 20 g (-30;-10) g/5 years less weight gain. Substituting 1-SD of boiled potatoes with vegetables and legumes was associated with 30 g (10;50 g)/5 years additional weight gain.

CONCLUSIONS
In a European population, intake of boiled potatoes was not associated with 5-y weight gain. Fried potatoes and French fries were associated with slight weight gain. No clinically meaningful associations with weight change were observed when substituting differently cooked potatoes METHODS with vegetables and legumes, bread, or rice and pasta.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP63_04

THE ASSOCIATION BETWEEN INDOOR BIOFUEL USE FOR COOKING AND GLUCOSE METABOLISM IN ADULTS: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

The burden of diabetes is rapidly increasing in low- and middle-income countries (LMICs) but determinants are not well-characterized. Household air pollution (HAP) from indoor biofuel for cooking has been associated with non-communicable diseases (NCDs) and may contribute to the increasing burden of diabetes in LMICs but data are limited. We assessed the association between indoor biofuel use for cooking and glucose metabolism in adults.

METHODS

In a cross-sectional analysis among human immunodeficiency virus (HIV) infected and uninfected adults, sociodemographic and NCDs risk factors were collected. The main predictor variable, HAP, established using reported information on where people routinely cooked (outdoor or indoor) and type of fuel used (electricity/gas or biomass fuel) and synthesized as minimal, moderate exposure and high exposure. Outcomes included markers of β-cell dysfunction (HOMA-β, insulinogenic index, oral disposition index) and insulin resistance (HOMA-IR, Matsuda index), prediabetes and diabetes. Logistic regression was used adjusted for age, sex, physical activity, smoking, socioeconomic status, HIV status, and BMI.

RESULTS

There were 1,871 participants, mean age 40.6 years, 59.8% female., Higher odds of low insulinogenic index were seen in, people with moderate (OR=2.13, 95%CI:1.27, 3.57) or high (OR=2.31, 95%CI: 1.39, 3.83) exposure to HAP compared to those with minimal exposure. HAP was not associated with other markers of β-cell function, insulin resistance, pre-diabetes and diabetes.

CONCLUSIONS
HAP is associated with increased risk of β-cell dysfunction among individuals using bio-fuel for cooking indoors. Longitudinal studies are needed to confirm these RESULTS.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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THE IMPACT OF NUTRITIONAL, SENSORY AND CULINARY SUPPORT ON IMPROVING THE FOOD-RELATED QUALITY OF LIFE IN CANCER PATIENTS TREATED WITH CHEMOTHERAPY

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BACKGROUND AND OBJECTIVES

Cancer and its treatments significantly affect physical health and overall quality of life (QoL) (1-2), yet the food-related QoL (FR-QoL) remains underexplored. Furthermore, sensory alterations are prevalent among cancer patients and are associated with reduced food enjoyment and intake (3,4). The study aims to assess whether nutritional, sensory and culinary support via consultations and adapting meals to the sensory capacities of each patient could improve the FR-QoL.

METHODS

This randomised, multicentric, prospective interventional study included 209 patients with breast cancer undergoing chemotherapy, divided into control (n=104) and intervention (n=105) groups. Participants were assessed at baseline (V1, before chemotherapy) and after four chemotherapy cycles (V2). Data collected at V1 and V2 included FR-QoL, health-related QoL (EORTC-QLQ C30), anthropometric measures, chemosensory assessments using taste strips and scratch and sniff tests, nutrient intake, and food consumption using 24-hour dietary recalls. The intervention group received a CANUT guide, a booklet with sensory-adapted culinary advice and 35 recipes, along with two dietary consultations. Meanwhile, the control group received standard care without the CANUT guide or dietary consultations. Mixed regression modelling was performed to investigate the effects of time (V1 vs V2) and intervention (control vs intervention groups) on FR-QoL and other measures

RESULTS

The findings revealed a significant decline over time in FR-QoL ($p < 0.001$) and health-related QoL ($p < 0.001$) in cancer patients undergoing chemotherapy. Olfactory measures also deteriorated, with reduced odour identification ($p < 0.001$) and pleasantness ($p < 0.001$), alongside heightened odour intensity ($p = 0.012$). However, no significant changes were observed in taste, anthropometric measures, nutrient intake, or food consumption over time. While the intervention offering nutritional, sensory, and culinary support showed potential, its effects on FR-QoL and other measures were comparable to the control group ($p > 0.05$).

CONCLUSIONS

These findings highlight the complex challenges associated with managing the nutritional, sensory, and QoL impacts of chemotherapy and emphasise the need for innovative strategies to better support patients.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP63_06

EVALUATION OF THE EFFECTIVENESS OF 5A-5R COUNSELING SERVICES FOR TOBACCO CESSATION, A MAJOR RISK FACTOR FOR NONCOMMUNICABLE DISEASES

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BACKGROUND AND OBJECTIVES

Tobacco use remains a significant public health challenge globally and a major risk factor for noncommunicable diseases and premature deaths. The 5A-5R counseling model, endorsed by the World Health Organization (WHO), is effective for tobacco cessation in diverse settings, but its application in LMICs remains underexplored. This study aims to evaluate the effectiveness of culturally adapted 5A-5R counseling services alone or with mobile phone-based remote support in reducing tobacco consumption among adults in a primary healthcare setting.

METHODS

A randomized control trial was conducted over eight months in Birganj, Dinajpur district, Bangladesh. The study included 668 adult participants who were current daily tobacco users and were randomly assigned to three arms: (1) conventional 5A-5R counseling, (2) 5A-5R counseling with mobile phone based remote support, and (3) a control group receiving usual care. Data were collected through interviewer-administered questionnaires and were facilitated by trained community health workers. Interventions were delivered by community health care providers. We performed descriptive analysis on continuous and categorical variables to compare changes in primary and secondary outcomes in the end line compared to the baseline. Statistical significance was determined using p-values (<0.05) and 95% confidence intervals. Data were analyzed using Stata version 17.0.

RESULTS

Among smoking tobacco users, the multicomponent arm showed a reduction in tobacco use from 30% to 18%, with a 12% quitting rate (P<0.01) in end-line analysis. In the 5A-5R-only arm, smoking tobacco use decreased from 50% to 27%, resulting in a 23% quitting rate (P<0.01) while the control arm showed no significant difference. Again, for smokeless tobacco users, the multicomponent arm demonstrated a significant reduction from 85% to 41%, corresponding to a 44% quitting rate (P<0.01), while the 5A-5R-only arm reduced use from 67% to 34%, with a 33% quitting rate (P<0.01) in end line survey. In terms of reduction if not quitted, only the 5A-5R-only arm led to a significant decrease in cigarette consumption (7.4±4.5 sticks/day, P<0.01) and smokeless tobacco consumption (5.9±1.4 times/day, P<0.01), no significant reductions were observed in the other arms.

CONCLUSIONS

The study found that the 5A-5R counseling model, particularly when delivered in-person through the health care providers, was highly effective in promoting tobacco cessation and reducing tobacco consumption in a primary health care setting.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP63_07

CARDIOMETABOLIC HEALTH EFFECTS OF DIETARY COUNSELING ON A HIGH-QUALITY, FIBER-RICH DIET IN ADULTS WITH TYPE 2 DIABETES: A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Individuals with type 2 diabetes are at increased risk for developing cardiovascular disease (CVD). A healthy diet is pivotal in effective management of CVD risk factors. We assessed how dietary counseling on a high-quality, fiber-rich diet influenced the cardiometabolic health profile of patients with type 2 diabetes.

METHODS

In this six-month trial, 121 patients with type 2 diabetes (age 67 ± 8.7 years, 68% men, mean body mass index 27.8 kg/m2) were randomly assigned to counseling by a dietitian (n=61) or to a control group that continued with standard care and usual diet (n=60). The counseling included 4-7 individual sessions with the dietitian, aimed at improving diet quality by focusing on increasing the intake of fiber-rich foods. As primary outcome, a composite cardiovascular risk score was used to estimate ten-year CVD risk. Secondary outcomes included changes in diet quality, assessed by the Dutch Healthy Eating Index-2015 (DHD15-index), changes in individual risk factors (HbA1c, LDL-cholesterol, blood pressure, and body weight), and changes in medication use. As objective markers of dietary intake, folic acid status and 24-hour urinary sodium and potassium excretion were measured.

RESULTS

Predicted ten-year CVD risk at baseline was 2.2 ± 1.4% in the control group and 2.3 ± 1.4 in the intervention group and did not change during the trial period (difference in change between groups -0.1%, 95%CI: -0.2; 0.1). The mean diet quality score (DHD15-index) at baseline was 115 ± 26 out of 160 and was similar across groups. Over the six months, the intervention group improved their DHD15-index score by 4.5 points (95%CI: -0.2; 9.1) more than the control group. No statistically significant differences between groups over time were found for HbA1c (-1.1 mmol/mol, 95%CI: -4.4; 2.3), LDL-cholesterol (0.0 mmol/l, 95%CI: -0.1; 0.1), blood pressure (-1 mmHg, 95%CI: -6; 4), body weight (-0.1 kg, 95%CI: -1.2; 1.1), or medication use (change in medication effect score 0.1, 95%CI: -0.5; 0.7). Urinary sodium-to-potassium ratio was 1.8 at baseline, did not change over time and no differences between the two groups were found. Folic acid status did not differ between the groups at 6 months.

CONCLUSIONS

Dietary counseling for six months slightly improved self-reported adherence to a high-quality, fiber-rich diet in patients with type 2 diabetes but did not significantly impact cardiometabolic health or medication use.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP63_08

ADAPTATIONS OF MUSCLE STRENGTH AND QUALITY IN MALE AND FEMALE OBESE OLDER ADULTS AFTER 12 WEEKS OF CITRULLINE SUPPLEMENTATION COMBINED WITH HIGH-INTENSITY INTERVAL TRAINING

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BACKGROUND AND OBJECTIVES

In our previous research (PMID:35257499), a 12-week High-Intensity Interval Training (HIIT) combined with citrulline (CIT) supplementation enhance the health status of obese older adults (OOA). However, it remains unclear if these health benefits are sex-dependent. We aim to assess sex differences in muscle and biological adaptations following a 12-week intervention combining HIIT with CIT in OOA.

METHODS

Eighty-one OOA completed a 12-week HIIT intervention (3 times/week) combined with either a citrulline [HIIT-CIT: n=45 (men=20, women=25)] or a placebo [HIIT-PLA: n=36 (men=18, women=18)] supplementation. Body composition (DXA/QPCT), absolute muscle S (AMS) and quality (AMS relative to body mass or specific lean mass) and serum metabolites were compared pre (T0) and post (T12) intervention (3-way-anova with repeated measures; $p<0.05$: significant). Pearson's correlations between S parameters and metabolites were also performed.

RESULTS

We observed sex-divergent health adaptations following the intervention. Only Men increased significantly their lean mass compared to women after the intervention (M: T0=54±9 - T12=55±7 vs. W: T0=41±5 - T12=41±5). Specifically, HIIT-CIT women exhibited a higher increase (+15%) in leg extension S (N; HIIT-CIT: T0=277±64 - T12=320±70 vs. HIIT-PLA: T0=272±62 - T12=270±55) than HIIT-CIT men (+11%). Only HIIT-CIT women exhibited a higher significant increase in leg extension S relative to leg lean mass (N.kg-1; HIIT-CIT: T0=9.4±2.2 - T12=10.6±1.9 vs. HIIT-PLA: T0=9.6±2.0 – T12=9.6±1.7). In men, total lean mass was significantly positively correlated to ceramide (18:1/16:0) ($r2 = 0.43$; $p <0.01$). In women, leg extension S was significantly positively correlated to carnitine C80:1 ($r2 = 0.42$; $p <0.01$) and to acetylputrescine ($r2 = 0.46$; $p<0.01$). Additionally leg extension S relative to leg lean mass was negatively correlated to glycodeoxycholic acid ($r2 = -0.45$ $p< 0.01$).

CONCLUSIONS

Although previous research has concluded that HIIT-CIT is beneficial for OOA, it appears that women and men don't adapt in the same way. This raises the question of how to consider strength to determine sarcopenia and sarcopenic obesity: should we use absolute strength or muscle quality? These findings underscore the importance of assessing sex differences in adaptations to address specific recommendations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP63_09

REPLACING DIETARY RED MEAT WITH NON-SOY LEGUMES HAS NO EFFECT ON SYSTEMIC INFLAMMATION VIA GUT BARRIER FUNCTION OR CHOLINE METABOLISM IN 6-WEEK RCT WITH HEALTHY MEN

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BACKGROUND AND OBJECTIVES

While the health burden of high red and processed meat intake has been acknowledged in observational studies, evaluation of the effects of unprocessed red meat intake and relevant underlaying mechanisms in healthy participants have generated mixed findings. Our aim was to see whether in apparently healthy men a partial replacement of unprocessed and processed red meat (from 760 g/week to 200 g/week) with non-soy legume foods yields beneficial effects on plasma markers of systemic inflammation through changes in gut barrier function and choline metabolism.

METHODS

This study was a 1:1 randomized, partly controlled, 6-week parallel trial (age 37.9 y, BMI 25.5 ± 3.3 kg/m2, mean ± SD) with two groups following either a diet supplemented with unprocessed and processed red meat (Meat group, n = 51) or with non-soy legumes and meat (Bean group, n = 51). Between-group differences in markers of inflammation as primary outcomes, and white blood cell counts, markers of barrier function, choline metabolism and body fatness as secondary outcomes were tested at 6 weeks using ANCOVA model adjusted with the baseline. This trial is registered at clinicaltrials.gov as NCT04599920.

RESULTS

We report no differences in circulating levels of high sensitivity CRP (Meat 0.85 mg/L (95%CI 0.61, 1.08) and Bean 0.79 mg/L (0.55, 1.02), P=0.54), glycoprotein acetyls (Meat 0.71 mmol/L (0.70, 0.73) and Bean 0.70 mmol/L (0.69, 0.72), P=0.39), cytokines and other immune modulators between the groups. Although a lower percentage of eosinophils, concentration of plasma total choline and higher urine dimethylamine excretion (g/day) in the Bean group were observed, no differences in urine trimethylamine-N-Oxide (TMAO) excretion (g/day) or lipopolysaccharide Binding Protein (LBP), a marker of gut barrier, occured. Interestingly, the Bean group losing more weight did not translate to between group differences. But we identified BMI, hip-waist ratio and LBP as important factors explaining individual/overall variance within the markers of Olink Inflammation panel. In addition to confirming previously reported associations between certain cytokines and BMI, we were able to identify others linked to TMAO and/or LBP and fiber independently of BMI.

CONCLUSIONS

It is known that a large variation between individuals exist in the function immune system. More attention should be paid in separating the effects in the context of red meat intake in healthy individuals.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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Precision and clinical nutrition

OAP 06 - PRECISION AND CLINICAL NUTRITION

OAP6_02

THE INTERINDIVIDUAL VARIABILITY OF ADIPOSE TISSUE PROVITAMIN A CAROTENOID CONCENTRATIONS IS LINKED TO COMBINATIONS OF SINGLE NUCLEOTIDE POLYMORPHISMS

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BACKGROUND AND OBJECTIVES

Carotenoids are a group of lipophilic pigments of plant origin. In the human body, some can be converted to vitamin A (VA) and are thus referred to as proVA carotenoids, with β-carotene (BCAR), α-carotene (ACAR), and β-cryptoxanthin (BCRY) being the main ones in our diets. Adipose tissue serves as their primary storage site, accounting for 80-85% of total body BCAR, where they are involved in several processes, including oxidative stress and inflammation. The determinants of their concentrations in adipose tissue are not well characterized and this study thus aimed to identify single nucleotide polymorphisms (SNPs) associated with them.

METHODS

Periumbilical adipose tissue samples were collected on 6 occasions in 43 healthy adult males, who had their whole genome genotyped, and proVA carotenoid concentrations were measured by HPLC. Following the selection of 44 candidate genes assumed to be involved in adipose tissue or blood proVA concentrations, the association of the corresponding 2398 SNPs on the DNA chips with adipose tissue proVA concentrations were assessed by partial least squares regression.

RESULTS

ProVA carotenoid concentrations in adipose tissue ranked as follows: BCAR > ACAR > BCRY. Adipose tissue proVA concentration exhibited an interindividual variability ranging from 54 to 66% (CV). A PLS regression model including fasting BCAR concentrations and 10 SNPs in 8 genes (*BCO1*, *CAPN2*, *CXCL8*, *IRS1*, *LIPC*, *MGLL*, *PPARG*, *PTPRT*) explained 69% (adjusted R^2) of the variability in adipose tissue BCAR concentrations. Another model including fasting ACAR concentrations and 12 SNPs (same genes and 7 SNPs in common) explained 59% of the variability in adipose tissue ACAR concentrations. For BCRY, a PLS regression model including 14 SNPs in 9 genes (*ABCA1*, *CAPN8*, *CXCL8*, *INSIG2*, *IRS1*, *ISX*, *MC4R*, *PPARG*, *PTPRT* and 3 SNPs in common with BCAR and ACAR) explained 67% of the variability in adipose tissue BCRY concentrations. RESULTS from canonical correlation analysis and multivariate PLS regression to explore the relationships between datasets will also be presented.

CONCLUSIONS

The interindividual variability in adipose tissue proVA carotenoid concentrations is, at least partly, due to combinations of SNPs in genes involved in carotenoid and lipid metabolism.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP6_03

ALMONDS AND THEIR IMPACT ON THE IMMUNE RESPONSE FOLLOWING INFLUENZA VACCINATION: A RANDOMISED CONTROLLED TRIAL OF A VACCINATION MODEL OF IMMUNE RESPONSE IN HEALTHY ADULTS

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BACKGROUND AND OBJECTIVES

Some nutrients and food supplements have been shown to optimise the immune response to influenza vaccination, however, no studies have assessed the impact of a whole food. Almonds may benefit immune function due to their immunoregulatory nutrients and fibre content, the latter known to interact with the immune system via the microbiome. This study aimed to investigate the effect of whole almonds on the immune response following influenza vaccination.

METHODS

In this randomised controlled trial, healthy adults (40-64 years) were randomised to consume almonds (56 g/d) or isocaloric control (pretzels; 86 g/d) for 8 weeks (NCT05515263). At week 4, both groups received seasonal influenza vaccine (quadrivalent). Blood samples were collected at 4 (immediately pre-vaccination) and 8 (4 weeks post-vaccination) weeks to quantify antigen-specific antibody titres using the hemagglutination inhibition assay. The primary outcome was the proportion of participants achieving seroconversion for ≥1 of the four vaccine strains. Participants reported upper respiratory symptoms during the intervention and follow-up (2 and 3 months post-vaccination) using the Wisconsin Upper Respiratory Symptom Survey.

RESULTS

Ninety participants were randomised. In the almond group, 38/41 (93%) participants achieved seroconversion for ≥1 strain, which was not significantly different to the control group (37/39 participants, 95%). Seroconversion rates did not differ between the almond and control groups for any vaccine strain: AH1N1 subtype (68% *vs* 74%), AH3N2 subtype (59% *vs* 62%), B/Victoria lineage (71% *vs* 59%) or B/Yamagata lineage (78% *vs* 62%). Incidence of upper respiratory symptoms (participants with ≥ 1 episode) did not differ between groups for common cold (almonds: 24%, control: 31%; p=0.52) or influenza-like illness (almonds: 27%, control: 18%; p=0.34).

CONCLUSIONS

While almonds are rich in nutrients supporting immune function, they may not offer additional benefits in enhancing seroconversion in a healthy population, where the influenza vaccine is already highly effective. Future studies using different immune response models, or in those with weaker immune responses, such as older people, may better elucidate the role of almonds in improving immune response.

CONFLICTS OF INTERESTS

AV has been supported by a doctoral fellowship from the Almond Board of CaliforniaED has received an education grant from Alpro, research funding from the Biotechnology and Biological Sciences Research Council, British Dietetic Association, Almond Board of California, the International Nut and Dried Fruit Council and Nestec Ltd and has served as a consultant for Puratos and Danone.EP has no conflicts of interest.KW has received research grants related to diet and gut health and disease from Almond Board of California, Danone,

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and International Nut and Dried Fruit Council and has received speaker fees from Danone and Yakult. KW is the holder of a joint patent to use volatile organic compounds as biomarkers in irritable bowel syndrome (PCT/GB2020/051604). KW receives royalties from Wiley Publishing in relation to an academic textbook on nutrition and dietetics in gastroenterology.Research funding from the Alliance for Potato Research & Education and Almond Board of California. Received consultancy fees from ZOE Ltd. Received funding to attend a conference from Yakult UK Limited.VT has no conflicts of interest.WH has received research funding from the Alliance for Potato Research & Education and Almond Board of California. Received consultancy fees from ZOE Ltd. Received funding to attend a conference from Yakult UK Limited

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OAP6_05

MULTI-TISSUE, MULTI-OMICS STUDY TO UNDERSTAND THE BIOLOGICAL SIGNATURE OF CHILDHOOD EDEMATOUS SEVERE MALNUTRITION (KWASHIORKOR)

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BACKGROUND AND OBJECTIVES

Edematous malnutrition, aka kwashiorkor, is a phenotype of childhood severe malnutrition comprising oedema, fatty liver, and skin and hair changes. Despite high fatality, the etiology and pathophysiology of kwashiorkor remain enigmatic. This study aimed to understand the molecular pathophysiology of kwashiorkor to provide insights into its potential etiological mechanisms.

METHODS

We recruited children aged 6 to 59 months with kwashiorkor (n = 60), marasmus (n = 60) and non-acutely malnourished children (n = 60) matched on sex, age and clinical severity at a hospital and several health centres supported by Médecins Sans Frontières in Niger from 2018 - 2019. Blood plasma, urine and stool samples were collected at admission to the hospital or at a community feeding or health center for in-depth biochemical profiling. Blood plasma was additionally obtained at discharge from the hospital and at the end of the ambulatory nutritional rehabilitation. Using a multi-omics, multi-tissue approach, we integrated plasma lipidomics, metabolomics, and proteomics, urine metabolomics, and gut microbiome data to identify pathways specific to kwashiorkor.

RESULTS

Our RESULTS demonstrate that kwashiorkor is characterized by increased extracellular matrix (ECM) remodeling and impaired lipid transport, particularly of cholesterol-related lipids. No significant (plasma or urine) metabolomic or gut microbiome signatures were specifically linked to kwashiorkor.

CONCLUSIONS

These findings suggest that kwashiorkor is an inflammatory syndrome leading to ECM degradation-related edema. Further research on the role of inflammatory triggers that contribute to kwashiorkor development is needed and can potentially point to more effective therapeutic strategies for children with oedematous malnutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP6_06

INFLUENCE OF VITAMIN D-RELATED GENE GENOTYPES (VDR, GC, AND CYP2R1) ON THE RESPONSE TO DIETARY INTAKE CHANGES. THE MYFOOD4SENIOR PROJECT

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BACKGROUND AND OBJECTIVES

Vitamin D is a critical nutrient in bone health, yet deficiency states are frequently reported. This study investigates the interaction between VDR, GC, and CYP2R1 and vitamin D intake, as well as its biochemical values, in Spanish individuals aged 65 and older. The study was conducted before and after a 6-month nutritional education intervention.

METHODS

Blood samples from 120 volunteers were analysed for plasma 25-OH vitamin D and genotyped for: rs2228570 (FokI), rs2282679, and rs10741657. A genetic risk score for vitamin D deficiency, depending on the three genotypes, was estimated based on scientific evidence. Each participant was asked for vitamin D supplement use and completed two three-day food records, at baseline and after 6-months of intervention.

RESULTS

A statistically significant difference was observed in plasma 25-OH vitamin D levels between individuals taking supplements and those who did not (22 ng/ml *vs.* 37 ng/ml, $p < 0.001$), despite a higher dietary vitamin D intake in the non-supplemented group (4.15 µg/day *vs.* 2.06 µg/day, $p = 0.04$). In the supplemented group, significant differences in baseline plasma 25-OH vitamin D levels between genotypes were observed only for rs2228570 (AA + AG: 43.7 ng/ml *vs.* GG: 29.5 ng/ml, $p = 0.04$). In the non-supplemented group, significant differences based on genotype were observed for rs2282679 (GG: 16.6 ng/ml *vs.* GT: 20.8 ng/ml *vs.* TT: 24.23 ng/ml $p = 0.02$) and for the genetic risk score (High risk: 21.52 ng/ml *vs.* Intermediate risk: 19.09 ng/ml *vs.* Low risk: 26.17 ng/ml; $p = 0.04$). After 6 months of nutritional intervention, there was no significant change in vitamin D intake or serum 25-OH vitamin D levels. However, in non-supplemented individuals, biochemical responses varied significantly according to the overall genetic risk score ($p = 0.05$), with the intermediate risk score being the most sensitive, and the highest risk score the least sensitive to increasing biochemical values with increasing vitamin D intake ($p = 0.03$).

CONCLUSIONS

When vitamin D supplemented, individuals carrying the A allele for rs2228570 (FokI) reach higher plasma 25-OH Vitamin D levels. In non-supplemented individuals, mutations in rs2282679 are associated with lower levels. Moreover, targeting the three genes at a time may help identify responsive individuals at dietary levels of intake. The identification of genotypes with different sensitivity to vitamin D intakes and supplementation is important in tailoring personalized treatments for individuals at risk for deficiency.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP6_07

GENETIC PREDISPOSITION AND HEALTH BEHAVIORS OF LIFE'S ESSENTIAL 8, ON CORONARY HEART DISEASE RISK AND CORONARY ARTERY CALCIUM

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BACKGROUND AND OBJECTIVES

Life's Essential 8 (LE 8) recommends DASH- and Mediterranean-style eating patterns as being most consistent with optimal cardiovascular health. Plant-based diets have also been shown to benefit cardiovascular health and prevent coronary heart disease (CHD). However, no prior studies have investigated its additive effect in combination with other ideal health behaviors included in LE 8 on CHD prevention. Furthermore, limited attention has been given to interactions with genetic predisposition, which may add personalized health behavior recommendations. Therefore, we developed a combined lifestyle score, the healthy plant-based diet index-lifestyle (hPDI-Lifestyle) score, including a healthy plant-based diet index as dietary component, evaluated its association with CHD incidence and atherosclerosis development, and investigated potential effect modification with genetically predicted CHD risk.

METHODS

A total of 7,764 participants from the population-based Rotterdam Study were included in the analysis. Multivariable Cox proportional hazard models were used to estimate hazard ratios (HRs) and 95%-confidence intervals (CIs) for CHD according to categories of the hPDI-Lifestyle score, stratified by polygenic risk score of CHD. Generalized linear modelling (GLM) was used to assess associations of hPDI-Lifestyle score and log-transformed coronary artery calcium score plus 1 (log [CAC+1]).

RESULTS

We documented 918 CHD cases during 116,324 person-years of follow-up. Ideal adherence to the hPDI-Lifestyle was associated with a 20% lower CHD risk among participants at low genetic risk (HR 0.80, 95% CI 0.71-0.90), and a 44% lower CHD risk among those at high genetic risk (HR 0.56, 95% CI 0.49-0.63), compared with participants at high genetic risk but with poor adherence to the hPDI-Lifestyle (p for interaction < 0.001). No significant associations were observed between hPDI-Lifestyle adherence and genetic risk with log [CAC+1] (βs [95% CI], per SD, hPDI-Lifestyle score: -0.10 [-0.27-0.06]), but a decreasing trend in reverse-transformed CAC scores was observed among participants with higher adherence to the hPDI-Lifestyle, within each genetic risk subgroup.

CONCLUSIONS

Our findings support recommendations to adopt a healthful plant-based dietin combination with non-smoking, adequate physical activity and moderate sleep duration. Potential differences by genetic predisposition and the role of lifestyle on subclinical CHD prevention warrants further investigation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 17 - PRECISION AND CLINICAL NUTRITION

OAP17_01

ASSOCIATION OF SERUM 25-HYDROXYVITAMIN D LEVELS WITH INFLAMMATORY MARKERS AND LUNG FUNCTION IN UK BIOBANK PARTICIPANTS WITH INFLAMMATORY BOWEL DISEASES

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BACKGROUND AND OBJECTIVES

Previous studies have established a relationship between serum 25-hydroxyvitamin D (25(OH)D) levels and lung function. However, the role of inflammatory markers in the relationship among patients with inflammatory bowel disease (IBD) is still unclear. This study aimed to identify which inflammatory biomarkers significantly influence the relationship between serum 25(OH)D levels and lung function in patients with IBD.

METHODS

The UK Biobank study included 497,134 participants recruited between 2006 and 2010. Among them, 4,088 participants had IBD. The serum of 25(OH)D levels (nmol/L) was measured and classified into quintiles: Q1 (<29), Q2 (29~41), Q3 (41~53), Q4 (53~67), and Q5 (>67). Q1 served as the reference group, and linear regression analysis was used to examine the differences in inflammatory marker levels and lung function across Q2 to Q5, using Q1 as the reference. This analysis adjusted for sex, age, education, income, ethnicity, current smoking status, energy intake, body mass index, health score, moderate metabolic equivalents, and alcohol frequency. Additionally, a counterfactual-based mediation analysis was performed to identify which inflammatory biomarkers significantly influence the relationship between serum 25(OH)D levels and lung function in patients with IBD.

RESULTS

After adjustments, the levels of blood glucose (mmol/L), white blood cells (WBCs) (10^9 cells/L), and neutrophils (10^9 cells/L) were lower in Q2 to Q5 compared to Q1. Significant reductions were observed in blood glucose for Q2 (-0.15, standard error [SE] = 0.07, $p = 0.04$) and Q5 (-0.15, SE = 0.08, $p = 0.04$), WBCs were notably lower in Q3 (-0.23, SE = 0.09, $p = 0.01$) and Q5 (-0.36, SE = 0.10, $p < 0.01$). Neutrophil counts were also significantly reduced in Q3 and Q5 ($p < 0.01$). In contrast, lung function parameters, measured in liters, were higher in Q2 to Q5 compared to Q1. Forced expiratory volume in 1 s (FEV1) significantly increased in Q2 (0.07, SE = 0.03, $p = 0.02$), Q3 (0.11, SE = 0.03, $p < 0.01$), Q4 (0.06, SE = 0.03, p=0.04), and Q5 (0.07, SE = 0.03, $p = 0.02$). Forced vital capacity (FVC) also increased significantly in Q2 (0.10, SE = 0.04, $p = 0.01$), Q3 (0.11, SE = 0.04, $p < 0.01$), and Q5 (0.09, SE = 0.04, $p = 0.02$).

CONCLUSIONS

Blood glucose levels, white blood cell counts, and neutrophil counts may be critical factors linking serum 25(OH)D levels to lung function in the IBD population within the UKB.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP17_04

CHANGES DURING SYSTEMIC THERAPY IN COMPUTED TOMOGRAPHY-EVALUATED BODY COMPOSITION PREDICT LONG-TERM SURVIVAL IN COLORECTAL CANCER

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BACKGROUND AND OBJECTIVES

Low muscle mass is associated with poor clinical outcomes in colorectal cancer, however the impact of body composition changes has rarely been explored. This study aimed to evaluate the prognostic value of body composition changes during systemic anti-cancer treatment (SACT) for colorectal cancers (CRC).

METHODS

A prospective study was conducted in an ambulatory SACT centre. Chart review and patient survey were used to record clinical, anthropometry, laboratory and quality of life variables. Routine computed tomography scans were analysed at L3 using OsiriX MD to determine muscle and adipose tissue body composition measures at baseline and follow-up within a year. Changes between scans were normalised over 100 days. Validated cut-offs were used to diagnose low muscle mass (1), low muscle attenuation (MA)(1) and cachexia (CC)(2). Median survival follow-up was 121.5 months and 60% were deceased at the censoring date. Multivariate Cox regressions stratified by treatment intent examined changes in MA, skeletal muscle index (SMI) and total adipose tissue index (TATI) as predictors of overall survival.

RESULTS

Of 1018 patients enrolled, 182 had CRC and 2 evaluable scans. At baseline, 40% had CC, 31% had low SMI and 39% had low MA. At follow-up, 39% had CC, 37% had low SMI and 41% had low MA. At baseline, 6% had BMI <20 kg/m² while 61% had BMI ≥25 kg/m². In patients undergoing SACT with palliative intent (n=91), MA increase by >5% over 100 days was associated with worse survival than stable MA [HR: 3.7 (95% CI: 1.4-9.3), p=0.006] and decreased TATI (>5%/100 days) was associated with worse survival than stable TATI (±5%) [HR: 1.9 (95% CI: 1.1-3.5), p=0.027], independent of changes in SMI, which were not significant. Body composition changes were not significant predictors on multivariate analysis for those treated with curative intent.

CONCLUSIONS

In the palliative CRC cohort, the negative impacts of fat loss and increased MA may represent a deterioration from the insulin resistant/metabolic syndrome phenotype commonly observed in CRC, toward a fat-wasting phenotype associated with advancing cachexia. Larger prospective studies are needed to control for the impact of dietetic care and SACT exposure on body composition, considering dynamic changes in all body composition compartments.

CONFLICTS OF INTERESTS

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OAP17_05

GUT MICROBIOME AS A PREDICTOR FOR POSITIVE YOUTH DEVELOPMENT TRANSITION FROM CHILDHOOD TO EARLY ADOLESCENCE

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BACKGROUND AND OBJECTIVES

Growing evidence highlights the important role of the gut microbiome in mental health, underscoring the potential for leveraging this insight to promote positive youth development (PYD). This study aims to characterize the transition of PYD profiles from childhood to adolescence and explore the predictive value of the gut microbiome in shaping these developmental trajectories.

METHODS

This cohort study used two waves of data from the Chinese Adolescent Cohort study (children aged 8 to 11 years at baseline). Stool samples were collected at wave 1 and analyzed using 16s rRNA sequencing to profile the gut microbiota. Children were assessed for PYD at both time points and categorized into profiles by latent profile analysis. Stability and change between these profiles over the 2-year follow-up period were examined via latent transition analysis. A Light Gradient Boosting Machine model was developed to link the gut microbiota with PYD transition type, and model prediction was further validated using multinominal logistic analysis.

RESULTS

Among 1061 participants with 2-year follow-up, three PYD profiles were identified at both waves: limited development, average development, and considerable development. Fifteen microbial genera were identified as significant predictors of PYD transitions, such as *Sarcina*, *Lachnospiraceac_UCG.001*, *Eubacterium_eligens_group*, or *Ruminococcus_torques_group*. Children with higher abundance of these taxa were more likely transitioned to a stable or promoted class rather than a downgraded class (odd ratio ranging from 2.03 to 5.45) from childhood to adolescence. Notably, children in earlier stages of puberty were found to be more sensitive to the microbiome-PYD transition association. This predictive model for PYD transition type demonstrated excellent performance, with an area under the curve of 0.91.

CONCLUSIONS

The gut microbiome presents predictive value in the substantial transition of PYD from childhood to adolescence. Targeting specific gut taxa may inform future health promotion programs to optimize child development, particularly during the critical pubertal transition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP17_06

IMPACT OF PREOPERATIVE MEDIUM-CHAIN TRIGLYCERIDE (MCT) SUPPLEMENTATION WITHIN ENHANCED RECOVERY AFTER SURGERY (ERAS) PROTOCOLS ON PERIOPERATIVE OUTCOMES IN COLORECTAL CANCER PATIENTS

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BACKGROUND AND OBJECTIVES

Preoperative oral carbohydrate (CHO) solutions are known to improve patient comfort and facilitate postoperative recovery; however, evidence on their perioperative impact remains limited. This study aimed to evaluate the effects of preoperative supplementation with medium-chain triglyceride (MCT)-CHO solution on postoperative insulin resistance, perioperative stress responses, and nutritional status in colorectal cancer patients, while exploring the underlying mechanisms.

METHODS

1.A total of 120 patients undergoing colorectal surgery were randomized into two groups: the experimental group (MCT-CHO solution) and the control group (CHO solution). Primary outcomes included blood glucose, insulin levels, and insulin resistance, measured preoperatively, 3 hours postoperatively, and on POD 1 and 3. Secondary outcomes involved WBC, IL-6, CRP levels, VAS scores for thirst, hunger, and fatigue, as well as time to first flatus. Gut microbiota and metabolomic profiles were also assessed.

2.In an animal study, 40 male Sprague-Dawley rats were assigned to MCT-CHO, CHO, saline, or fasting groups. Blood glucose, insulin, leucine levels, and insulin-related indices were evaluated pre- and post-surgery. mRNA and phosphorylated protein levels of mTOR, IRS-1, PI3K, AKT, and GLUT4 in liver tissue were analyzed using PCR and Western blotting.

RESULTS

1.In patients, blood glucose, insulin levels, and insulin resistance showed no significant differences between groups preoperatively, 3 hours postoperatively, or on POD 3. However, these metrics were significantly lower in the MCT-CHO group on POD 1 ($P < 0.05$). Additionally, WBC, IL-6, CRP, and VAS scores for thirst, hunger, and fatigue were significantly reduced in the MCT-CHO group both preoperatively and on POD 1 and 3 ($P < 0.05$). Time to first flatus did not differ significantly between groups ($P = 0.411$).

2.In the rat model, postoperative blood glucose levels were significantly lower, and phosphorylated IRS-1, PI3K, and AKT levels were markedly higher in the MCT-CHO group compared to other groups ($P < 0.05$).

CONCLUSIONS

Preoperative supplementation with MCT-CHO solution improves postoperative insulin resistance and reduces perioperative stress responses more effectively than CHO solution alone, offering a novel approach to enhanced recovery after surgery (ERAS). Mechanistically, MCT-CHO exerts its effects by decreasing postoperative hepatic insulin resistance and enhancing insulin sensitivity via the PI3K/AKT/mTOR signaling pathway.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP17_07

MULTI-METABOLITE PLASMA SIGNATURE AS A ROBUST PREDICTOR OF LONG-TERM MORTALITY: A MULTI-COHORT STUDY

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BACKGROUND AND OBJECTIVES

Metabolomics represent a powerful approach to understand biological pathways related to aging and mortality. While several plasma metabolites have been associated with all-cause mortality, their independence, replicability, and clinical utility beyond conventional risk factors remain unclear. This study aimed to identify and validate a plasma metabolite profile independently associated with all-cause mortality in a Mediterranean dietary intervention trial and replicate findings in independent cohorts.

METHODS

Among 1,878 participants from a dietary intervention trial (2003-2019), 337 plasma metabolites were measured at baseline and after one year. Using elastic net penalized Cox regression, metabolites associated with all-cause mortality were identified at baseline in the discovery cohort. The resulting multi-metabolite signature was validated using one-year follow-up samples and replicated in four independent cohorts.

RESULTS

Thirty-eight plasma metabolites were identified as mortality predictors. GABA, homoarginine, serine, creatine, 1-methylnicotinamide, and specific sphingomyelins, plasmalogens, phosphatidylethanolamines and cholesterol esters showed inverse associations with mortality. Conversely, DMGV, choline, short and long-chain acylcarnitines, 4-acetamidobutanoate, pseudouridine, 7-methylguanine, N6-acetyllysine, phenylacetylglutamine and creatinine were associated with higher mortality. The multi-metabolite signature strongly predicted mortality in both the 1-y data from the discovery cohort and four independent cohorts.

CONCLUSIONS

This novel plasma multi-metabolite signature demonstrated robust predictive capability for all-cause mortality across diverse populations, suggesting potential applications in risk stratification and providing new insights into metabolomic pathways associated with survival.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 36 - PRECISION AND CLINICAL NUTRITION

OAP36_01

ASSOCIATION OF DIETARY INTAKE WITH BODY CELL MASS, CLINICAL OUTCOMES AND QUALITY OF LIFE IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKAEMIA

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BACKGROUND AND OBJECTIVES

In children with Acute lymphoblastic leukaemia (ALL), tailored dietary interventions can be planned if associations between diet and the functional and clinical outcomes are known. Diet in terms of dietary diversity has been associated with better immune function and reduced risk for certain types of cancers. This study aimed to evaluate the association of dietary intakes with body cell mass (BCM), clinical outcomes, and quality of life (QOL) during treatment, in children with ALL.

METHODS

A longitudinal study was carried out in children with ALL, aged 2 to 8 y recruited at time of diagnosis, and followed up during induction, consolidation and completion of delayed intensification phase (~6 m from diagnosis). Diet was estimated using 24-hour recalls collected over 3 non-consecutive days at each time point and dietary diversity score (DDS) calculated using the food group data obtained. Anthropometry, BCM using whole-body potassium counter and QOL using a validated questionnaire were assessed. At delayed intensification phase associations between dietary intake and the outcomes were analysed using multiple linear regression and logistic regression model adjusted for the sex, energy intake per kg body weight and baseline DDS.

RESULTS

At diagnosis, the mean age of the children (n = 32, 62.5% boys) was 4.6 ± 1.9 y. Clinically, 71.8% and 21.8% were identified as intermediate and high-risk ALL category respectively. The mean energy, protein intake per kg body weight and DDS were 76.5± 18.6 kcal, 2.53 ± 0.59g and 8.8 ± 1.4 respectively. The % BCM was 30.9 ± 4.6 %, BCM Index (BCMI, BCM/height (m)2) 4.6 ± 0.7 kg/m2. Across visits, dietary intakes were similar ($p>0.05$). At delayed intensification phase, higher DDS had significant associations with increased BCMI (β: 0.202; 95% C.I. (0.035, 0.368), p=0.019) and QOL score (β: 7.78; 95% C.I. (1.19, 13.6), p=0.01) and % BCM (β: 0.693; 95% C.I. (-0.139, 1.524), p=0.09). Similarly, higher DDS was significantly associated with lesser number of infections (Adjusted odds ratio: 0.650; 95% C.I. (0.420, 1.00), p=0.05).

CONCLUSIONS

Incorporating diverse diets may reduce treatment related complications in children with ALL.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP36_02

A RANDOMIZED, PLACEBO CONTROLLED, CROSSOVER CLINICAL TRIAL TO EVALUATE THE EFFECT OF A TURMERIC FORMULATION ON MUSCLE SORENESS AND FUNCTION RECOVERY IN MODERATELY ACTIVE ADULTS

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BACKGROUND AND OBJECTIVES

Turmeric may alleviate exercise-induced, delayed onset muscle soreness and function loss due to the strong anti-inflammatory and antioxidant activities of its active compounds, the curcuminoids. The primary objective of this trial was to evaluate the effect of a highly bioavailable turmeric formulation (TF) on delayed onset muscle soreness in male adults. The bioavailability of curcuminoids in this TF is not negatively affected by food matrices and can even be increased when administered with lipids, such as in a sports nutrition bar.

METHODS

In a randomized, placebo-controlled, crossover trial (ClinicalTrials.gov NCT04946981), 44 moderately active adults (34 males, 10 females) ingested a TF (300 mg/day, thereof 90 mg curcuminoids) or placebo for five days. On the second day, muscle damage was induced with exercise (30 min downhill run at 70% VO_2 max). Immediately before and 0, 24, 48, and 72 h post-exercise, muscle soreness during squat on quadriceps (visual analog scale), muscle function (knee extension dynamometer), muscle power (vertical jump test), muscle damage (creatine kinase), range of motion (knee flexion), and perceived wellness and wellbeing (questionnaire) were assessed. During exercise, exhaustion was assessed using the Borg Rating of Perceived Exertion. The primary trial population consisted of the male participants, outcomes in females were considered exploratory.

RESULTS

There were no significant differences between the TF and placebo in muscle soreness AUC from pre-exercise to 72 h post-exercise and at all timepoints, except for a trend observed in males at 72 h (adjusted mean difference (AMD) [SE] = -4.8 [2.7] mm, $p = 0.0776$). Muscle soreness recovery (difference between 72 h and maximum post-exercise) was significantly improved with the TF compared to placebo (AMD [SE] = -10.7% [4.3%], $p = 0.0184$ for the males, and -7.9% [3.6%], $p = 0.0346$ for the total sample). Furthermore, in males the decrease from pre-exercise to 24 h after exercise in isokinetic peak torque was significantly lower with the TF (AMD [SE] = 11.0 [4.9] Nm, $p = 0.0275$), as was the decrease in isokinetic max rep work (AMD [SE] = 11.6 [4.9] J, $p = 0.0195$), while vertical jump peak power at 24 h after exercise was higher (median [IQR] with the TF vs. placebo = 931.1 [825.9; 1001.1] W vs. 916.5 [824.8; 989.5] W, $p = 0.0445$).

CONCLUSIONS

Supplementation with the TF can accelerate exercise-induced muscle soreness recovery and could attenuate muscular function loss and improve performance 24 h after unaccustomed exercise in young, moderately active, male adults.

CONFLICTS OF INTERESTS

This research was funded by Givaudan France Naturals. KAS is an employee of Givaudan International SA. JL, SN, and PFB are employees of Givaudan France Naturals. They (KAS, JL, SN, and PFB) contributed to

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experimental design and write-up but were not involved in any data collection or analysis. RT, TW and SM were supported through a service agreement with Givaudan France Naturals.
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OAP36_03

MODULATORY EFFECTS OF FOOD ON THE GUT MICROBIOTA AND GUT RESISTOME

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BACKGROUND AND OBJECTIVES

The increasing prevalence of antibiotic-resistant bacteria and resistance genes (collectively, the gut resistome) poses a global health challenge. This study investigates how dietary phytochemicals, particularly anthocyanins from blueberries and Lycium berries, influence the gut microbiota and resistome, with a focus on their antibacterial and resistance gene modulation effects.

METHODS

Phytochemicals were extracted from blueberries and Lycium berries and identified using HPLC-DAD-ESI-QTOF-MS/MS. The additice effects of the plant extracts combined with antibiotics on inhibiting antibiotic-resistant bacteria were evaluated, and their regulatory impacts on antibiotic resistance mechanisms were investigated. The modulation of bacterial gene expression was analyzed via qPCR and transcriptomics, and molecular docking evaluated interactions between phytochemicals and bacterial proteins.

RESULTS

The blueberries and Lycium berries extracts demonstrated additive effects combined with gentamicin against *Acinetobacter baumannii* BAA-1605. The additive combination inhibited β-lactamase activity and reduced efflux pump activity. Transcriptomic analysis revealed additive combination downregulated key resistance-related genes (*mecA* and *NorA*), and molecular docking suggested strong binding affinities of phytochemicals (querctin, rutin) to bacterial efflux pump proteins (PBP2a, beta-lactamase, *NorA*).

CONCLUSIONS

Dietary phytochemicals, particularly anthocyanins, show promising potential for mitigating the spread of antibiotic resistance within the gut microbiota. These findings highlight the role of food-based interventions in addressing antibiotic resistance and improving gut health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP36_06

APPETITE TEST PLUS: ADAPTING THE STANDARD APPETITE TEST FOR ENHANCED CLINICAL APPLICATION IN CHILDREN WITH SEVERE ACUTE MALNUTRITION

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BACKGROUND AND OBJECTIVES

Severe acute malnutrition (SAM) treatment guidelines recommend using the appetite assessment through the "appetite test" as a tool for classification, and a criterion for hospital admission, treatment follow-up, and discharge. However, the existing scarce literature highlights the test's subjectivity and time-consuming nature. Therefore, this study aims to develop a new appetite assessment tool by adapting the standard "appetite test" to enhance its clinical utility for use in severely malnourished children.

METHODS

We conducted a cross-sectional study with observational method at two health facilities. Infants and children aged 6-59 months with SAM were included. Ten eating behaviors were identified from previous studies, comprising four positive eating behaviors(approach): opening mouth, leaning body forward, swiping/grabbing, and turning head toward Ready-to-Use Therapeutic Feeding (RUTF); and six negative behaviors(avoidance): refusing to open mouth, arching back, crying, pushing, turning head away, and spitting out RUTF. A total of 328 video extracts from 30 "appetite test" procedures were coded by four trained medical doctors and the study team. Additionally, 60 randomly selected videos were re-coded by the same coder after two weeks. Inter-observer reliability was evaluated using the Fleiss' kappa, while intra-observer reliability was measured with Cohen's kappa. Internal consistency was assessed using Cronbach's alpha, and associations among eating behaviors were analyzed using Spearman's Rho correlation.

RESULTS

Two positive behaviors, opening mouth (k=0.89, 95%CI:0.84,0.93) and swiping RUTF (k=0.79, 95%CI: 0.74,0.83), and all negative behaviors demonstrated moderate to high inter-observer reliability with acceptable agreement(k>0.60). Intra-observer reliability was also above the acceptable threshold for all negative and positive behaviors, except leaning forward(k=0.02). The internal consistency of negative behavior subscale(α=0.78) was higher than that of positive behavior subscale(α=0.56). The overall scale retained a Cronbach's alpha greater than 0.7, even when the last half of the RUTF feeding observations were excluded. All positive behaviors were positively correlated with each other, while all negative behaviors, except spitting out, exhibited a positive correlation with other negative behaviors.

CONCLUSIONS

Eating behavior cues expressed during the "appetite test" provides a reliable method with acceptable agreement in shorter observation durations. However, further validation studies are required before the clinical implementation of this newly developed tool.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP36_07

WILD BLUEBERRIES IN THE CONTEXT OF METABOLIC SYNDROME: PRELIMINARY FINDINGS FROM THE BLUMET DIETARY INTERVENTION STUDY

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BACKGROUND AND OBJECTIVES

The Metabolic Syndrome (MetS) represents a constellation of metabolic abnormalities including an impairment of vascular function. Blueberries, sources of polyphenols and other bioactive constituents, may positively influence MetS representing a possible alternative or coadjutant to drug therapy. Few human studies have been conducted evaluating the effect of blueberries on MetS (1-2). This study attempts to test the hypothesis that wild blueberries (WB) can normalize MetS risk factors, improve endothelial function and permeability, and reduce inflammation.

METHODS

Twenty-six subjects with risk factors for MetS are enrolled for an 8-week, randomized, double-blind, placebo-controlled, crossover trial (BLUMET study). Subjects consumed 240 ml/day of a WB drink (providing at least 560 mg of anthocyanins and 200 mg of chlorogenic acid) or a placebo drink. Each treatment is separated by an 8-week washout period. At the beginning and at the end of each intervention measurement of blood pressure, body composition, together with analyses of markers of cardiometabolic health, vascular and intestinal permeability, inflammation, and oxidative stress, is performed by routine laboratory assessment or by ELISA kits, while reactive hyperemia index and arterial stiffness, as markers of vascular function, are measured by plethysmography (Endo-PAT2000).

RESULTS

The RESULTS related to 10 out of 26 subjects have shown a significant reduction in insulin response (-15.6%; $p<0.05$), total cholesterol (-9.2%; $p<0.05$), and ratio of total cholesterol/HDL-cholesterol (-8.4%; $p<0.05$) following the WB drink compared to placebo. In addition, a trend to decrease systolic blood pressure (-6.65%; $p=0.061$) and increase adiponectin (+23.7%; $p=0.055$) has been documented. No effect has been observed for the rest of the markers under study.

CONCLUSIONS

The preliminary RESULTS obtained from the BLUMET study seem to suggest a possible contribution of WB in the management of MetS mainly through an improvement of lipid and glucose profile. The analysis of the full group of subjects will be crucial for providing a clear understanding of the positive role of wild blueberries in the context of MetS.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 54 - PRECISION AND CLINICAL NUTRITION

OAP54_01

CONTINUOUS GLUCOSE MONITORS CAN OVERESTIMATE THE GLYCAEMIC INDEX OF DRINKS – A RANDOMISED CROSSOVER TRIAL

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BACKGROUND AND OBJECTIVES

Continuous glucose monitors are increasingly used to characterise glycaemic responses to foods, yet the validity of continuous glucose monitors to quantify the glycaemic index of foods is unclear. The ability of continuous glucose monitors to accurately quantify glycaemic indices may also depend on properties of the foods ingested. The objective of this study was to compare glucose responses to different test drinks when measuring using capillary sampling *versus* continuous glucose monitoring of interstitial fluid.

METHODS

Fifteen healthy adults (9 female) completed 7 laboratory visits in randomised crossover design with at least 48 h washout between visits. During each visit, participants consumed a test drink/food which comprised of either 50 g glucose (CONTROL), a commercially available fruit smoothie containing 50 g available carbohydrate (PRODUCT), equivalent carbohydrate ingested as whole fruits (WHOLE), or as blended fruits (BLEND), the commercial product ingested over 30 min (SLOW), the commercial product ingested with 5 g inulin (FIBRE), and the commercial product ingested in a typical serving size providing 30 g carbohydrate (DOSE). Capillary (duplicate) and interstitial glucose were recorded every 15 min for 120 min and expressed as the incremental area under the curve (iAUC). For test drinks meeting glycaemic index (GI) testing guidelines, the GI was calculated relative to CONTROL.

RESULTS

The GI for PRODUCT was higher with interstitial (84±54), compared with capillary sampling (60±35; P=0.05), and was also higher for FIBRE with interstitial (80±41), compared with capillary sampling (56±25; P=0.05). In contrast, no evidence was observed for differences in the GI for WHOLE or BLEND with interstitial (62±38 and 65±17, respectively), compared with capillary sampling (57±38 and 55±29; P=0.26 and 0.18, respectively). Furthermore, there the difference between interstitial versus capillary fasting glucose concentrations varied by participant (main effect participant, p=0.001).

CONCLUSIONS

Continuous glucose monitoring can overestimate the glycaemic index drinks and there is evidence of inter-individual heterogeneity of the accuracy of continuous glucose monitors to estimate fasting glucose concentrations. Caution should be applied when interpreting absolute or relative glycaemic responses using continuous glucose monitors, and capillary sampling should be used when accurate quantification of glycaemic response is the priority.

CONFLICTS OF INTERESTS

The data in the current project were supported by an unrestricted grant from Innocent Drinks. For a full list of JTG's disclosures see https://gonzalezjt1.wordpress.com/2024/03/, JTG has received research funding from BBSRC, MRC, British Heart Foundation, Clasado Biosciences, Lucozade Ribena Suntory, ARLA Foods Ingredients and Cosun Nutrition Center; is a scientific advisory board member to ZOE and 6d Sports Nutrition; and has completed paid consultancy for The Dairy Council, PepsiCo, Violicom Medical, Tour Racing Ltd., the European Fruit Juice Association, and SVGC. JAB is an investigator on research grants funded by BBSRC,

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MRC, British Heart Foundation, Rare Disease Foundation, EU Hydration Institute, GlaxoSmithKline, Nestlé, Lucozade Ribena Suntory, ARLA foods, Cosun Nutrition Center, American Academy of Sleep Medicine Foundation and Salus Optima (L3M Technologies Ltd); has completed paid consultancy for PepsiCo, Kellogg's, SVGC and Salus Optima (L3M Technologies Ltd); is Company Director of Metabolic Solutions Ltd; receives an annual honorarium as a member of the academic advisory board for the International Olympic Committee Diploma in Sports Nutrition; and receives an annual stipend as Editor-in Chief of International Journal of Sport Nutrition & Exercise Metabolism.

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OAP54_02

IMPACT OF MORE PLANT-BASED DIETS ON GUT MICROBIOTA COMPOSITION AND FUNCTION: A 1-MONTH RANDOMIZED CROSS-OVER TRIAL IN MEN AT CARDIOMETABOLIC RISK

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BACKGROUND AND OBJECTIVES

More plant-based diets, which are lower in animal protein (AP) and higher in plant protein (PP) sources, have been associated with lower cardiometabolic risk but also differences in gut microbiota that may contribute to those health benefits. This study aimed to characterize the effects of a partial substitution of AP by PP on fecal microbiota composition and activity.

METHODS

We conducted a 1-month randomized cross-over trial with high dietary control in 19 men at cardiometabolic risk who consumed a flexitarian diet higher in PP (FL, 63% PP, all food groups, low in animal products) and an isocaloric control diet (CON, 34% PP). As previously reported, the intervention improved some cardiometabolic risk factors independently of the diet, with a trend towards greater improvement after FL. In this ancillary study, fecal microbiota composition and function were assessed by shotgun metagenomic sequencing followed by gene ontology analysis and a targeted metabolomics approach (LC-MS) on feces collected before and at the end of each diet arm. Data were analyzed using a non-parametric analysis (nparLD, R) testing the effect of time, diet and their interaction.

RESULTS

The evolution of the fecal metabolite profile was mostly similar after both diets, with only linoleic acid decreasing more after FL than CON. α and β diversity were unchanged but, irrespective of the diet, bacteria degrading complex carbohydrates (e.g., Lachnospira pectinoschiza, Bifidobacterium adolescentis) increased, possibly due to the high fiber intake in both diets (28 g/d in CON and 36 g/d in FL, compared to 21 g/d at baseline). 52 species changed with time differently according to the diet (p-diet*time <0.05), but only two remained significant after multiple-testing correction (q<0.1): Dysosmobacter segnis and Lactococcus cremoris decreased after FL while increasing after CON. Among those 52 species, Flavonifractor plautii showed the strongest decrease after FL and no change after CON, in line with its reported negative correlation with plant-based diets and positive correlation with cardiometabolic risk factor [1]. At the functional level, FL induced decreased potential bacterial capacities for indole production and increased potential for methanogenesis.

CONCLUSIONS

This study reveals subtle shifts in fecal microbiota after 1 month of a flexitarian diet with diversified PP sources in a tightly controlled dietary setting. To explore the cross-talk between changes in the gut microbiota and the host metabolic status, a multi-omic data integration including fecal metagenomic, and fecal and plasma metabolomics is underway.

CONFLICTS OF INTERESTS

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OAP54_03

DEVELOPMENT AND VALIDATION OF A SCREENING TOOL TO EVALUATE DIET, LIFESTYLE AND MENTAL HEALTH IN CANCER SURVIVORS

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BACKGROUND AND OBJECTIVES

The increasing rate of cancer survivorship highlights the need for high-quality care that addresses factors beyond cancer recurrence, such as diet, lifestyle, and other behaviors that may influence quality of life (QoL) and prognosis. There is a lack of validated screeners to assess these factors in cancer survivors. The aim was to develop and validate a screening tool to be used in both clinical and research settings.

METHODS

An international expert panel participated in a two-round e-Delphi to develop the screener. A face validity study was conducted with cancer survivors (n=12) to assess comprehension, construct interpretation, time to complete, and acquiescence of the screener. Construct validity was assessed in cancer survivors (n=103) (inclusion criteria <5 years since surgery or finishing chemotherapy and/or radiotherapy). Participants answered the screener, and validated diet, lifestyle, and mental health questionnaires. Body composition (InBody), physical activity (accelerometer), strength (dynamometer and 30-s chair test) and cortisol (saliva) were assessed. Data from these validated assessments will be compared to data obtained with the screener (ongoing) using Spearman and Intraclass correlations. All participants answered the screener 7-10 days later for reproducibility analysis.

RESULTS

The screener considers six domains (body composition, physical activity, diet and alcohol, smoking, sleep behavior, and psychosocial distress) which include 58 items. It is self-administered and available in English and Spanish. Participants of the face validity study (75% women; age: 51.9 ±9.6 years; 42% breast cancer) provided feedback on the screener and took 10.5 ±4.8 min to complete it. Refinements were made, leading to the final version of the screener. The validation study was carried out in 103 participants: 64% women; age: 58.1±12.2 years; the most common cancer being: 39.8% breast, 28.1% colorectal, 15.5% lymphoma. A total of 30.9% are still receiving hormonal or immunological treatment and the other 69.1% received the last treatment 2.6±1.9 years ago. Participants took 13.3 ±5.3 min to complete the screener. Data cleaning and statistical analyses are currently ongoing.

CONCLUSIONS

Validation of the screener is necessary for its application in clinical practice, which will allow for the early detection of health and wellness issues in cancer survivors, who could benefit from extra support, thereby enhancing QoL.

CONFLICTS OF INTERESTS

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The authors have no conflict of interest.

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OAP54_04

EGG WHITE-DERIVED PEPTIDES REDUCED BLOOD GLUCOSE IN HIGH-FAT-DIET AND LOW-DOSE STREPTOZOTOCIN-INDUCED TYPE 2 DIABETIC MICE VIA REGULATING THE HEPATIC GLUCONEOGENIC SIGNALING AND METABOLIC PROFILE

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BACKGROUND AND OBJECTIVES

Food proteins are considered an ideal source for the identification of bioactive peptides with the potential to intervene in nutrition-related chronic diseases such as cardiovascular disease, obesity, and diabetes. Egg white-derived peptides (EWPs) have been shown to improve glucose tolerance in insulin-resistant rats. However, underlying mechanisms are to be elucidated.

METHODS

The young male mice were randomly divided into the normal-diet group and high-fat diet (HFD) group. The mice in the high-fat-diet (HFD) group were fed with 60% HFD, while the normal diet group mice were given a normal diet for 7 weeks. In the fifth week, the mice fed the high-fat diet were treated with 40 mg kg−1 streptozotocin (STZ) dissolved in 0.1 mol L−1 citrate buffer for a consecutive 5 days, while the normal-diet mice received the vehicle solution only. To confirm the induction of DM, 7 days after the last STZ injection, the fasting blood glucose (FBG) levels of the mice were measured using a glucometer and blood glucose test strips (ROCHE, Germany). After 3 weeks of the STZ injections, the mice with blood glucose level >11.1 mmol L−1 together with manifestations of polydipsia, polyuria, and polyphagia were considered diabetic. The diabetic mice were randomly subdivided into three groups: T2DM, T2DM + EWP-low-dose (EWP-L, 500 mg per kg body weight) and T2DM + EWP-high-dose (EWP-H, 1000 mg per kg body weight). Mice in the EWP-L group and EWP-H group were given 500 mg kg−1 or 1000 mg kg−1 peptides by gavage daily for 7 weeks, while mice in the control and T2DM groups were given the same volume of distilled saline. The body weight, fasting blood glucose (FBG), and random blood glucose (RBG) of the mice were recorded weekly. The tissues were collected at the end of the protocol for the downstream analyses.

RESULTS

The RESULTS showed that 7 weeks of EWP treatment reduced the fasting blood glucose in T2DM mice and the inhibition of the liver gluconeogenic pathway was involved in the mechanisms of actions. In addition, the EWP treatment also altered the hepatic metabolic profile in T2DM mice, in which, the role of fatty acid esters of hydroxy fatty acids in mediating the hypoglycemic effect of EWPs might be pivotal.

CONCLUSIONS

The chronic treatment of EWP exerts a hypoglycemic effect in HFD-fed and low-dose STZ-induced T2DM mice. Potential molecular mechanisms include the inhibition of gluconeogenic signaling and the regulation of metabolic dis orders through FAHFAs metabolism. The RESULTS of this study suggest that EWP is a potential candidate for T2DM intervention.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP54_05

INVESTIGATING SYMPTOM VARIABILITY AND TREATMENT RESPONSE IN PERNICIOUS ANAEMIA: A LONGITUDINAL SYMPTOM TRACKING STUDY

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BACKGROUND AND OBJECTIVES

Pernicious anaemia (PA) is characterised by vitamin B12 (B12) deficiency due to autoimmune-mediated loss of gastric parietal cells and intrinsic factor (1). The current treatment guidelines for PA recommend one intramuscular B12 injection every 2–3 months (2). However, many patients, report needing more frequent injections to ameliorate symptom recurrence or severity (3–5), suggesting a need for a precision medicine approach to PA management. This study aimed to track daily symptoms in PA patients to examine day-to-day symptom variation and response to different treatment modalities.

METHODS

UK-dwelling adults with PA were recruited to a longitudinal study from the PA society membership. Participants self-reported their daily symptoms and severity (scale of 1–10) and recorded any B12 treatments received over a three-month period via an online survey. Descriptive statistics and pre- and post-treatment comparisons were used to assess symptom variability and treatment response. A favourable Ethical Opinion was received from the University Ethics Committee (EGA ref: FHMS 22-23 030).

RESULTS

The survey was distributed to 381 people, of whom 83 enrolled, and 68 completed the study (female: 82%, mean age: 63 [SD 11]) years old, range: 27–85 years). Tiredness was the most prevalent symptom (97%, overall mean severity 6.34, [SD 1.97]), followed by muscle pain (85%, 5.85, [SD 2.06]) and poor concentration (82%, 5.62, [SD 1.77]). Treatment frequencies varied and were categorised into 2–3 monthly (44%), monthly (26%), weekly (15%), and more than weekly (15%). Symptom severity decreased post-treatment across all symptoms, with tiredness reducing by 28.1% (mean pre: 5.38 [SD 2.55, range 1–10] to post: 3.87 [SD 2.96, range 0–10], $p < 0.001$), muscle pain by 31.41% (4.42 [SD 2.42, range 0.67–10] to 3.03 [SD 2.47, range 0–9.67], $p < 0.001$), and poor concentration by 40.47% (3.55 [SD 2.30, range 0.67–9.67] to 2.11 [SD 2.22, range 0–9], $p < 0.001$). Some participants experienced immediate relief post-treatment, while others reported delayed improvement, with response times ranging from 1.6 to 5 days.

CONCLUSIONS

This study highlights the large degree of heterogeneity of symptom experiences and treatment responses in PA patients, emphasising the need for personalised management strategies. Daily symptom tracking captured individual patterns, and future research should explore wearable tools like smartwatches to enable real-time monitoring, provision of individualised care, and improved symptom management and quality of life for PA patients.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP54_07

Food preference, reward and cravings after acute consumption of beverages containing plant-based or alternative sweeteners. RESULTS of the SWEET Beverages trial

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BACKGROUND AND OBJECTIVES

The SWEET Beverages trial was a multi-centre intervention across Spain, Denmark and UK examining the acute effects of three Sweeteners & Sweetness enhancers blends compared to sucrose on satiety, consumer preference, safety & health. We present here the RESULTS related to food intake behaviour after acute consumption of S&SE blends delivered in beverage format.

METHODS

Double-blind randomised crossover study with 60 healthy participants (47% female; mean±SD age 31±10 y; BMI 29±3 kg/m2). At each visit participants consumed 330 ml of a beverage containing either a blend of two S&SEs (0 kcal) or 8% sucrose (106 kcal), followed by a standardised breakfast served 7 min later (400-600 kcal). The blends were stevia RebM 80% purity with mogroside V 50% purity; stevia RebA 95% purity with thaumatin; and sucralose with acesulfame-K. Appetite and gastro-intestinal sensations were measured for three hours post intake, alongside food hedonics (20 min post-consumption), and food cravings (end of the day). Data were analysed with mixed effects linear regression. TRIAL REGISTRATION: ClinicalTrials.gov NCT04483180.

RESULTS

There was no impact of blend on any of the food preference/reward scores for fat or sugar biases (i.e. explicit liking; explicit wanting; implicit liking; choice frequency for high-fat relative to low-fat, and for sweet relative to savoury foods) (all $p>0.05$). In adjusted models, end of day craving control scores were lower after the sucralose-containing blend vs. any of the other blends and vs. sucrose (adjusted 0-100 pt mean score±SE: 55.8.1±3.5 vs. 65.1 to 66.2±3.5, respectively; $p<0.01$) while craving for sweet scores were higher vs. sucrose (40.6±3.4 vs. 33.5±3.4; $p<0.05$). Craving for savoury and positive mood did not differ by blend. Irrespective of blend, compared with older participants (46-60 y), younger ones (18-45 y) showed higher implicit wanting (14.9±4.9 vs. -14.9±11.9, $p<0.05$), and higher choice frequency for high-fat foods (5.1±1.7 vs. -4.8±4.2, $p<0.05$). BMI, sex, beverage liking or desire, and appetite did not modulate food behaviour responses.

CONCLUSIONS

Two novel stevia-containing blends plus a known sucralose-containing blend elicited comparable food hedonic responses in a sample of individuals with overweight and obesity, after acute consumption, but a sucralose/acesulfame K-containing blend showed reduced craving sensations vs. sucrose.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP54_08

CHANGES IN SERUM 25(OH)D, ZONULIN, BODY MASS INDEX, AND DIETARY INTAKE LEVELS AFTER SUPPLEMENTATION OF PROBIOTICS AND VITAMIN D AMONG OVERWEIGHT AND OBESE HEALTHCARE WORKERS: A RANDOMIZED TRIAL DURING COVID-19 PANDEMIC

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BACKGROUND AND OBJECTIVES

Overweight or obese frontline healthcare workers (HCWs) face an increased risk of COVID-19 infection due to vulnerabilities linked to their nutritional status and eating habits. We examined the changes in serum 25(OH)D levels, zonulin (a marker of gut integrity), body mass index (BMI), body weight (BW), waist circumference (WC), and dietary intake after a 3-month supplementation with combined probiotics and vitamin D among healthcare workers during the COVID-19 pandemic.

METHODS

We conducted a 12-week randomized controlled trial with 81 healthcare workers (HCWs) who frequently interacted with COVID-19 patients at three Jakarta and West Java referral hospitals. Participants were assigned to receive daily supplementation of either probiotic *Lactobacillus plantarum* Dad-13 combined with 1000 IU of vitamin D (ProD; n=39) or a placebo (n=42) and counselling on healthy diets and lifestyles. We employed analysis of covariance to compare changes in serum 25(OH)D and zonulin levels as the primary outcomes during the intervention. Additionally, we examined changes in dietary intake and anthropometric measurements at baseline, one month, two months, and three months as secondary outcomes. This analysis was adjusted for specific covariates between the groups.

RESULTS

Eighty-one HCWs participated in a three-month intervention, with 39 assigned to the ProD group and 42 to the placebo group. The baseline characteristics, including age, BW, BMI, WC, IgG antibody response, working hours, demographic factors, and the history of COVID-19 vaccinations and infections, were similar across both groups. After adjusting for age, gender, health care, work duration, multivitamins consumption, COVID history, and BW, serum 25(OH)D levels increased significantly in the ProD group compared to the placebo group (MD of 5.8 ng/mL (95% CI: 3.3 to 8.3; p=0.000). Additionally, the ProD group (n=37) exhibited a greater decrease in zonulin levels than the placebo group (n=36) (MD of -5.5 ng/mL (95% CI: -11.5 to 0.4; p=0.067). These mean anthropometric assessment and dietary intake changes were not statistically significant between groups.

CONCLUSIONS

Combined probiotics and Vitamin D supplementation improve 25(OH)D levels and intestinal integrity, potentially reducing COVID-19 infection risk in overweight and obese healthcare workers, but no effect on dietary intake and anthropometric indicators.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP54_09

FUSARIUM VENENATUM DERIVED B-GLUCANS ENHANCE INTESTINAL BARRIER INTEGRITY BY MODULATING TIGHT JUNCTION PROTEINS, IMMUNE RECEPTOR ACTIVATION, AND TRANS-EPITHELIAL RESISTANCE

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BACKGROUND AND OBJECTIVES

A dysfunctional gut barrier is associated with inflammation and susceptibility to infection. Dietary 1-3,1-6 β-glucans may optimise innate immune surveillance and attenuate inflammatory status (Del Cornò et al., 2020) through interaction with Dectin-1 and other molecular pattern receptors (Herre et al., 2004). Additionally, they may enhance epithelial barrier function by modulating the expression and assembly of tight junction proteins, contributing to overall gut health (Qiao et al., 2022). We aim to determine whether 1-3,1-6 β-glucans derived from *F. venenatum* promote a healthy intestinal barrier.

METHODS

1-3, 1-6 glucans were isolated from several sources including mycoprotein, a food derived from the filamentous fungus *Fusarium venenatum*. Isolated glucans were applied to cultured intestinal epithelial cells, outcomes included cell viability; expression, localisation and functionality of tight junction proteins via q-PCR, immunofluorescence and transepithelial electrical resistance (TEER) respectively. Immune cells were studied for the induction of glucan receptors and downstream inflammatory pathways

RESULTS

The expression of tight junction protein 3 and Claudin 1 were elevated by 1-3,1-6 β-glucans. Increased tight junction integrity was observed in the TEER assay dependent on glucan source. Glucans were dose dependently associated with Dectin-1 induction in immune cells, further studies will determine whether improved tight junction integrity was linked to dectin-1 activation.

CONCLUSIONS

F. venenatum derived myco-glucans improve intestinal barrier integrity *in vitro*, suggesting postbiotic benefit. I*n vivo* studies are needed to confirm whether dietary fungi are effective at improving barrier function in consumers

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 57 - PRECISION AND CLINICAL NUTRITION

OAP57_01

INCREASING THE PROPORTION OF SLOWLY DIGESTIBLE STARCH IN THE DAILY DIET IMPROVES GLYCEMIC VARIABILITY AND CONTROL IN TYPE 2 DIABETIC PATIENTS

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BACKGROUND AND OBJECTIVES

Diet plays a crucial role in managing Type 2 Diabetes (T2D), with starchy foods being the main carbohydrate source. The degree and speed of starch digestibility are influenced by several factors and may be characterized into 3 types: Rapidly Digestible Starch (RDS), Resistant Starch (RS), and Slowly Digestible Starch (SDS) the latter modulating glycemic peaks. Increasing the SDS content in the diet seems to be a relevant strategy to manage postprandial hyperglycemia in T2D. Glycemic variability (GV) has arisen as a component of T2D dysglycemia, which was associated to cardiovascular complications. This study investigates the impact of increasing SDS in the daily diet on GV, glycemic control, and the cardiometabolic profile of T2D patients.

METHODS

In a 12-week randomized, controlled and parallel trial, 51 T2D patients followed either a high-SDS (H-SDS) or low-SDS (L-SDS) diet, guided by specific dietary and culinary advice, and supply of commercial starchy products, selected for their SDS content. GV parameters were assessed using Continuous Glucose Monitoring System (CGMS) with the Mean Amplitude of Glucose Excursions (MAGE) as the primary outcome. Biological glycemic control and cardiometabolic parameters were also measured.

RESULTS

Compared to L-SDS diet (17.2 ± 1.0g SDS/day), H-SDS diet (63 ± 1.0g SDS/day) significantly reduced the intraday GV after 3 months: MAGE (-11.5% vs +9.4%, $p=0.0005$), SD (Standard Deviation ($p=0.0021$), CV (Coefficient of Variation) ($p=0.0056$), CONGAs (Continuous Overall Net Glucose Action) ($p<0.001$) and MIME (Meal Indices of Meal Excursions) Glycemic Delta ($p=0.0013$). Also, lower interday GV, represented by IQR50 ($p=0.0007$) and MODD (Mean of Daily Differences, $p=0.0515$) and risk of hyperglycemia (HBGI, $p=0.0863$; ADRR, $p=0.0506$) were obtained with the H-SDS diet. HbA1c and C-peptide levels significantly decreased ($p<0.05$). Fasting glucose, insulin, glucagon, HOMA-IR and cardiometabolic parameters remained unchanged.

CONCLUSIONS

Increasing the SDS content in daily diet with simple culinary and dietary advice on starchy products choices and cooking significantly improved GV and glycemic control in T2D, to achieve HbA1c targets (<7%). Modulating starch digestibility appears as a relevant nutritional strategy to improve glycemic management in T2D.

CONFLICTS OF INTERESTS

Alexandra Meynier is an employee of Mondelez France R&DSophie Vinoy is an employee of Mondelez France R&D

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OAP57_02

PERSONALIZED DIETARY FIBRE MIXTURES BASED ON IN VITRO MICROBIAL SCFA PRODUCTION REDUCE INSULIN RESISTANCE (HOMA-IR) IN INDIVIDUALS WITH PREDIABETES AND OVERWEIGHT/OBESITY

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BACKGROUND AND OBJECTIVES

The gut microbiota ferments dietary fibres into short-chain fatty acids (SCFAs), which can improve the host metabolism. However, long-term supplementation of isolated single dietary fibres showed no consistent metabolic benefits, emphasizing the role of individual differences in the microbial fermentation capacity. Post-hoc analyses suggest that microbial SCFA producing taxa may predict response to dietary fibre intervention, but prospective evidence is largely lacking. This study aimed to investigate the effects of a personalized fibre mixtures (PFM), designed to enhance gut microbial SCFA production, on insulin sensitivity.

METHODS

This randomized, placebo-controlled, double-blind parallel study included 44 individuals with overweight/obesity (body mass index (BMI) 28–40 kg/m², age 35–70 y) with prediabetes and/or insulin resistance. Anaerobic fecal samples were collected from each individual to screen for a fibre mixture that produces the highest amount of SCFAs using an *in vitro* colon model. Participants were randomized into two groups: 22 subjects received 24g of the *in vitro* defined PFM, and 22 received a single fibre control (galacto-oligosaccharides) for 12 weeks. Insulin sensitivity, the primary outcome determined by hyperinsulinemic-euglycemic clamp, was assessed alongside indirect calorimetry, body composition, and analyses of blood hormones, metabolites and inflammation markers. Additionally, microbial metabolites in faeces and blood were measured before and after the intervention.

RESULTS

No differences in the change in peripheral insulin sensitivity (M-value) was observed between groups. However, PFM decreased fasting insulin (Δ -0.98 ± 2.48 vs 0.90 ± 2.96 u*U*/mL, P=0.037), HOMA-IR (Δ -0.27 ± 0.65 vs Δ 0.22 ± 0.76, P=0.036), body weight (Δ -0.28 ± 2.3 vs Δ 1.37 ± 1.5 kg, P=0.014), and BMI (P=0.017) with a trend toward reduced body fat mass (P=0.073) compared to control. The PFM increased both plasma and faecal branched-chain fatty acid isovalerate (P<0.05) and showed a trend toward increased isobutyrate levels (P<0.1) compared to control. No differences were observed in energy expenditure, substrate oxidation, blood lipids, inflammatory markers, gut-derived hormones, or plasma and faecal SCFAs levels between the groups.

CONCLUSIONS

Compared to the control, PFM supplementation did not affect peripheral insulin sensitivity but slightly decreased body weight and reduced HOMA-IR (marker of insulin resistance), suggesting a benefit for hepatic insulin sensitivity. Personalized fibre approaches may help improve metabolic health in individuals at high risk for type 2 diabetes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP57_03

GUT MICROBIAL CLUSTERS IN CHILDREN SHOW DIFFERENT CARDIOMETABOLIC RESPONSES TO WHOLEGRAINS – A POST-HOC ANALYSIS OF THE KORN RANDOMIZED TRIAL

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BACKGROUND AND OBJECTIVES

The beneficial effects of wholegrain intake on cardiometabolic risk may be mediated by the gut microbiota. In adults, there are indications that cardiometabolic responses to diet, including wholegrains, depend on the gut microbiome ecosystem structure. However, this has not been investigated in children. We aimed to identify gut microbial clusters among Danish children and explore their role in the cardiometabolic response to high wholegrain intake.

METHODS

We used data from a randomized cross-over study involving 51 Danish children aged 8-13 years with high BMI, who received *ad libitum* breads, pasta and cereal products with wholegrain oats and wholegrain rye (WG) and refined grain (RG) for 8 weeks in random order. Anthropometry, body composition, blood pressure, blood lipids and markers of glucose metabolism and inflammation as well as short-chain fatty acids in blood and feces were assessed at 0, 8 and 16 weeks. Fecal microbiota composition was determined by 16S rRNA gene amplicon sequencing and microbial clusters were identified by partitioning around medoid clustering. We used linear mixed models to investigate potential modifying effects of baseline microbial cluster on the cardiometabolic effects of WG *vs* RG.

RESULTS

Children consumed 108±38 and 3±2 g/d wholegrain in the WG and RG period, respectively (P<0.001) (Madsen et al. 2024). We identified two clusters dominated by Faecalibacterium, Bacteroides, Ruminococcus and Lachnospiracae (Cluster 1, n=25), and Bifidobacterium and Clostridium and lower α-diversity (Cluster 2, n=26), respectively. Cluster modified the effect of WG on the children's BMI z-score, fat mass index, and waist circumference (all, P-interaction≤0.002), which were reduced among children in Cluster 1 and increased in Cluster 2. Cluster also modified the effect of the intervention on plasma HDL cholesterol (P-interaction=0.03), which was increased by 0.09 (0.03, 0.15) mmol/L with WG vs. RG in Cluster 2 only.

CONCLUSIONS

Two distinct gut microbial clusters were identified which appeared to influence the effectiveness of wholegrain intake in reducing children's fat mass and increasing HDL cholesterol. We speculate that Cluster 2 reflects a less mature gut microbiota, but this needs further investigation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP57_04

MACHINE LEARNING-IDENTIFIED HABITUAL DIETARY PATTERNS ARE ASSOCIATED WITH HOST METABOLISM THROUGH GUT MICROBIOTA MEDIATION

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BACKGROUND AND OBJECTIVES

Diet influences the gut microbiome and host metabolism, yet the underlying mechanisms remain unclear. Using multi-omics tools combined with an autoencoder machine learning approach, this study aimed to identify latent dietary patterns and their associations with plasma metabolites, gut microbiota, and potential causal pathways.

METHODS

We analyzed plasma (n=139) and stool (n=109) samples along with food records surveys (n=151) from 71 healthy adults (mean 53.4y). Participant data were longitudinally collected for approximately one year (averaging 335d). Latent dietary patterns were identified using nutrient and food group data with an autoencoder approach (deep learning neural network architecture). Plasma metabolomics and gut microbiome profiling were performed using untargeted liquid chromatography-mass spectrometry and 16S rRNA sequencing, respectively.

RESULTS

Two distinct dietary patterns were identified: DP0, a “meat-dominant” pattern with high meat and poultry intake, and DP1, a “balanced meal” pattern emphasizing mixed meals of protein and vegetables (e.g., sandwiches and wraps). Compared to DP0, DP1 was associated (*P*BH<0.25) with different levels of 35 metabolites, after adjusting for age and sex. Additionally, DP1 was linked to higher abundances of 6 gut microbial taxa relative to DP0, including *Parabacteroides* (coefficient=0.32, *P*BH=0.09) and *Butyricimonas* (coefficient=0.28, *P*BH=0.13). Mediation analysis revealed 9 significant mediation effects (*P*medi<0.05), indicating that 5 out of these 6 microbial taxa mediated the relationship from dietary patterns to the metabolites across 5 metabolic pathways: benzoate, food component/plant, leucine, isoleucine, and valine, monoacylglycerol, and androgenic steroids metabolism. For instance, *Butyricimonas* mediated the relationship between DP1 and cinnamoylglycine (βmedi=0.14) as well as DP1 and 3-phenylpropionate levels (βmedi=0.14).

CONCLUSIONS

Overall, habitual balanced dietary patterns were associated with significant differences in gut microbiome and metabolome profiles compared to meat-dominant patterns. These findings also highlight the potential mediating role of the microbiome in dietary influences on host metabolism.

CONFLICTS OF INTERESTS

Alessandra Celli does not have a conflict of interest.Caroline Bejikian does not have a conflict of interest.Dalia Perelman is the member of the scientific advisory board of January AI. Heyjun Park does not have a conflict of interest.Michael Snyder, has the following potential conflicts of interest: MPS is a cofounder and scientific advisor of Crosshair Therapeutics, Exposomics, Filtricine, Fodsel, iollo, InVu Health, January AI, Marble Therapeutics, Mirvie, Next Thought AI, Orange Street Ventures, Personalis, Protos Biologics, Qbio, RTHM, SensOmics. MPS is a scientific advisor of Abbratech, Applied Cognition, Enovone, Jupiter Therapeutics, M3 Helium, Mitrix, Neuvivo, Onza, Sigil Biosciences, TranscribeGlass, WndrHLTH, Yuvan Research. MPS is a cofounder of NiMo Therapeutics. MPS is an investor and scientific advisor of R42 and Swaza. MPS is an investor in Repair BiotechnologiesPranav Berry does not have a conflict of interest.Rachel Battersby does not have a conflict of interest.Xiaotao Shen does not have a conflict of interest.

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OAP57_05

IN SILICO GUT MICROBIOME METABOLIC MODELING IDENTIFIES METABOLITES THAT ARE ASSOCIATED WITH METABOLIC HEALTH AND ARE MODIFIABLE BY DIETARY INTERVENTIONS

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BACKGROUND AND OBJECTIVES

Obesity and diabetes are associated with alterations in the human gut microbiome composition and function, which in turn influence how the gut microbiome interacts with dietary factors and host tissues. *in silico* gut microbiome metabolic modeling provides a method to elucidate diet-microbiome community functional and mechanistic relationships underlying the production of metabolites that influence both gut barrier and host health. In two large-scale national and European cohorts, we evaluated 1) the ability of *in silico* human gut microbiome community metabolic modeling to delineate human metabolic health phenotypes , 2) the validity of identified *in silico* signatures using metabolomics, and 3) the effect of dietary interventions to drive predicted metabolites toward signatures reflective of improved metabolic health.

METHODS

In the EU MetaCardis Cohort (n = 2000 subjects) and the French GutInside weight loss cohort (n= 1855 subjects), we used shotgun stool metagenomics data to perform compartmentalized constraint-based *in silico* gut microbiome community metabolic modeling. Predicted metabolites were then analyzed in relation to obesity and metabolic health. Cardiometabolic diseases and heterogeneous obesity phenotypes were defined clinically, and metabolic health was defined with a data-driven score. *In silico* predicted metabolites were evaluated for their association with serum metabolomics. Finally, we used dietary interventions to determine if diet significantly modifies predicted metabolites.

RESULTS

The modeling approach identified 62 predicted metabolites associated with obesity-related phenotypes independently of usual dietary habits. A total of 19 identified metabolites were common across Class I to Class III obesity. A further 14 predicted metabolites were associated with the metabolic health score. A sub-population of predicted metabolites were significantly correlated with serum metabolomics, which included metabolites related to human metabolic health. Using dietary pattern interventions and nutrient compositions, we found diet shifted predicted metabolites in both diet- and individual-dependent manners.

CONCLUSIONS

in silico gut microbiome metabolic models provide clinically relevant predicted metabolite signatures stratifying host obesity- and metabolic health and identify functional interactions that reflect human health. Collectively, this work paves the way for the use of this modeling approach in precision or personalized nutrition interventions for human metabolic health.

CONFLICTS OF INTERESTS

KC is a scientific collaborator of Integrative PhenomicsTS and NF are employees of Integrative Phenomics

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OAP57_06

THE INTERACTION OF SEX AND THE CHEESE MATRIX ON THE CHOLESTEROL RESPONSE TO DAIRY FAT IN MIDDLE-AGED ADULTS

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BACKGROUND AND OBJECTIVES

Despite being a source of saturated fat, cheese has been shown to lower total and LDL cholesterol concentrations compared to butter (1,2). The dairy matrix is thought to be responsible for this effect. While diet can influence disease rise in a sex-specific manner (3), the interaction between sex and the cheese matrix in the cholesterol response to dairy fat is largely unexplored, which this study aims to investigate.

METHODS

The present work is secondary analysis of pooled data from two parallel-arm randomised controlled trials with similar protocols (4,5). Participants (*n* 197, 41.6% male) received either 120g, full-fat cheddar cheese (*n* 104) or deconstructed cheese (49g butter, 30g calcium caseinate and a calcium supplement, *n* 93) for 6-weeks. Each arm provided ~40g dairy fat per day.

RESULTS

In the group as a whole, full-fat cheese was shown to lower total and LDL cholesterol compared to deconstructed cheese (-0.21 ± 0.69 mmol/L vs 0.01 ± 0.68 mmol/L, P=0.002). No sex x treatment interactions were observed, although within-sex analysis found males and females to respond differently. Within males, cholesterol concentrations decreased in response to cheese (-0.23 ± 0.57 mmol/L) and butter (-0.11 ± 0.61, P=0.189). Within the female group, full-fat cheese lowered total (-0.19 ± 0.77 mmol/L) and LDL cholesterol (-0.19 ± 0.61 mmol/L) concentrations, whereas deonstructed cheese was found to increase the same lipid markers (0.10 ± 0.73 mmol/L, P=0.004; 0.03 ± 0.58 mmol/L, P=0.001) No sex x treatment interactions were observed for LDL (P=0.619) or HDL (P=0.678) particle size, or for large (P=0.146) or small (P=0.658) LDL particle concentrations.

CONCLUSIONS

Full-fat cheese was found to lower cholesterol concentrations in the cohort as a whole, while males and females were found to respond differently to dairy fat. Females appear to respond more favourably to full-fat cheese comapred to deconstructed cheese, indicating that the cheeese matrix may have a stronger role in females, which may play a role in personalised nutrition.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP57_07

ASSOCIATION BETWEEN DIETARY LIVE MICROBES AND FATIGUE MEDIATED BY FOLATE: FINDINGS FROM A CROSS-SECTIONAL STUDY OF THE U.S. NATIONAL SURVEY IN OLDER ADULTS

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BACKGROUND AND OBJECTIVES

Fatigue is a debilitating condition in older adults and can reduce independence. A deficiency in folate, a vital nutrient for energy metabolism, is strongly linked to more severe fatigue [3]. The gut microbiome plays a vital role in folate metabolism, with microbes such as Lactobacillus converting dietary precursors into tetrahydrofolate, a bioactive form of folate [4,5]. Thus, the consumption of live microbes, found in fermented foods and fresh produce, may help alleviate fatigue by improving folate bioavailability and metabolism via the gut [2]. This study examines the association between dietary live microbe intake and fatigue, emphasizing folate as a mediator, and provides insights into microbiota-targeted nutritional strategies to mitigate fatigue.

METHODS

We analyzed data from 2,353 older U.S. adults (≥60 years) in NHANES (2021–2023) [6]. Fatigue, assessed via a single-item question from the PHQ-9 “Feeling tired or having little energy” divided as Low ("Not at all/Several days") or Moderate-Severe ("More than half of days/Nearly every day"). Red blood cell folate, measured through standardized assays, served as a biomarker of long-term folate status. Dietary data from 24-hour recalls classified live microbe intake across 9,388 food codes into Low ($<10^4$ CFU/g), Medium (10^4–10^7 CFU/g), or High ($>10^7$ CFU/g) [7]. Covariates included demographics, comorbidities, and energy intake. Multivariable weighted logistic and multinomial logistic regression models decomposed the effects of live microbe on fatigue, mediated through folate, while accounting for complex survey design.

RESULTS

The mean age was 69.4 years (SD = 6.3), with 46.1% male. Live microbe intake was low (28.3%), medium (45.5%), or high (26.5%), and 15.4% reported moderate-severe fatigue. Multivariable analysis indicated that higher live microbe intake was associated with reduced odds of fatigue (ORHvs.L=0.52, 95% CI: 0.34–0.79, p=0.005), as was a higher level of folate (ORHvs.L=0.60, 95% CI: 0.40–0.92, p = 0.021). Higher live microbe intake was associated with increased odds of elevated folate levels (ORHvs.L=1.40, 95% CI: 1.09–1.80, p = 0.012). Mediation analysis showed that folate partially mediated this relationship, accounting for 26% of the effect.

CONCLUSIONS

A diet rich in live microbes may help alleviate fatigue, partly by enhancing folate levels. However, the cross-sectional design of this study limits causal interpretations, underscoring the need for longitudinal studies or intervention trials.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP57_08

NOVEL POPULATION-SPECIFIC GENETIC VARIANTS ASSOCIATED WITH VITAMIN B12 BIOAVAILABILITY IN HEALTHY INDIANS

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BACKGROUND AND OBJECTIVES

Vitamin B12 deficiency is a prevalent health concern that can lead to hematological and neurological disorders. Despite adequate dietary intake, inter-individual variability in B12 absorption and metabolism, influenced by genetic and environmental factors, can result in insufficiency/deficiency. While previous studies have explored the genetic basis of circulating vitamin B12 levels, they have not validated these findings using precise measurements of B12 bioavailability. This study aimed to measure the plasma bioavailability of an oral dose of [13C]-labelled B12 (cyanocobalamin) in a cohort of 104 healthy Indian individuals using pharmacokinetic modelling and examine its associations with genetic variants in key genes involved in B12-related pathways.

METHODS

Oral B12 bioavailability was measured over 10 h after administration of [13C]-cyanocobalamin tracer (~2.5 μg) in healthy participants (n=104) aged 18-40 years with BMI < 25 kg/m². The plasma B12 bioavailability was estimated from the kinetics of the tracer appearance in plasma using a 2-compartment model. Functional B12 markers including plasma total B12 and active B12 (HoloTC) were measured. Genotyping was conducted using Illumina GSA array, with quality control and imputation performed to yield SNPs for association analysis with B12-related traits. Polygenic risk score (PRS) was calculated, with cross-validation and positive predictive value (PPV) was used to evaluate predictive performance for supplementation needs.

RESULTS

The mean measured B12 bioavailability was 52% ± 16%, demonstrating significant 4.4-fold variability. A total of 54 SNPs in or near 10 genes were significantly associated with plasma total B12 bioavailability, including 5 previously reported SNPs for B12-related traits and 49 novel variants from known B12 pathway genes. PRS was computed, explaining more than 70% of the variance in B12 bioavailability in the same cohort, and 43% in a 3-fold cross validation test. At the 1st quartile threshold, the PRS identified individuals requiring supplementation with a PPV of 0.40.

CONCLUSIONS

These findings provide insights into the genetic determinants of vitamin B12 absorption and homeostasis, emphasizing the potential of genetic markers for personalized nutritional strategies. This is particularly critical for identifying populations who are susceptible to B12 deficiency despite adequate dietary intake, highlighting the need for precision nutrition using precise functional measurements of B12 bioavailability in specific populations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP57_09

ASSOCIATION BETWEEN COMPOSITE DIETARY ANTIOXIDANT INDEX AND RISK OF HEPATIC STEATOSIS AND FIBROSIS AMONG CHOLECYSTECTOMY ADULTS: EVIDENCE FROM NHANES 2017-2020

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BACKGROUND AND OBJECTIVES

Cholecystectomy increases the incidence of metabolic associated fatty liver disease and fibrosis. Antioxidants protect the liver from oxidative stress and inhibit the development of metabolic dysfunction-associated steatotic liver disease (MASLD), yet the epidemiological evidence that links dietary antioxidants to hepatic steatosis and fibrosis in patients who underwent cholecystectomy is not available. Therefore, the present study aimed to investigate the association of dietary composite dietary antioxidant index (CDAI) with the risk of hepatic steatosis and fibrosis in the cholecystectomy population.

METHODS

Data of 773 participants from the National Health and Nutrition Examination Survey (NHANES) 2017-2020 were analyzed. Intake of dietary antioxidants were collected to calculate CDAI. The controlled attenuation parameter (CAP) and liver stiffness measurement (LSM) assessed by the vibration controlled transient elastography (VCTE) were used to identify hepatic steatosis and hepatic fibrosis, respectively. Weighted multivariate logistic regression and restricted cubic spline (RCS) regression were conducted to analyze the association.

RESULTS

Weighted multivariate logistic regression analysis with full adjustment for confounding variables showed a negative association between CDAI and hepatic fibrosis in individuals underwent cholecystectomy [OR (95%CI) = 0.87 (0.79, 0.94), *P*=0.010], while non-significant association was found between CDAI and MASLD. Moreover, compared to the lowest quartile, the highest quartile of CDAI was associated with a lower risk of hepatic fibrosis [OR (95%CI) = 0.28 (0.13, 0.60), *P*=0.007]. The RCS analysis further indicated a linear negative relationship between intake of CDAI and the risk of hepatic fibrosis (*P* overall<0.001).

CONCLUSIONS

Our findings suggest that higher dietary antioxidants intake may be associated with lower risk of hepatic fibrosis among individuals underwent cholecystectomy, whereas there was no evident association between CDAI intake and the risk of hepatic steatosis. Further studies are needed to validate current findings and explore the underlying mechanisms.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 08 - BASIC RESEARCH IN NUTRITION

OAP8_01

ENRICHMENT OF THE DIET OF BLACK SOLDIER FLY (HERMETIA ILLUCENS) LARVAE WITH ERGOSTEROL FOLLOWED BY UV-B EXPOSURE PRODUCES LARVAE VERY RICH IN VITAMIN D

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BACKGROUND AND OBJECTIVES

Vitamin D (VD) is essential for humans and many animals. It comes either from food or from skin synthesis under the action of UV-B rays. Two molecules have almost equivalent VD activity. VD3, or cholecalciferol, is the form synthesized by humans and animals in the skin under the action of UV-B rays. Its precursor is 7-dehydrocholesterol. VD2, or ergocalciferol, is synthesized by UV-B exposure of ergosterol, a molecule found mainly in mushrooms. Edible insects, and more particularly the black soldier fly, which are known to be interesting sources of proteins, are not particularly rich in this vitamin. We have nevertheless shown that they can bioaccumulate high concentrations of carotenoids and vitamin E (1-3). It is in this context that we aimed to investigate whether black soldier fly larvae (BSFL) can bioaccumulate high concentrations of ergosterol and whether this ergosterol can be converted into VD2 by exposing the larvae to UV-B light.

METHODS

BSFL were reared on mushrooms for 2 wks and then exposed, before killing them, to UV-B light (2.7 mW/cm2/s for up to 5h). Following this experiment, ergosterol and VD (VD2 and VD3) were quantified by HPLC in the larvae.

RESULTS

These analyses allowed the following observations to be made: larvae non-exposed to UV-B did not contain any detectable amount of VD2 or VD3. Larvae reared on mushrooms and not exposed to UV-B contained a high concentration of ergosterol (702 ± 95 mg/Kg FW) and did not contain any detectable amount of VD2 or VD3. Larvae reared on mushrooms and then exposed to UV-B for 1h contained high concentrations of VD2 and VD3 (46 ± 2 and 10.9 ± 0.5 mg/Kg FW, respectively).

CONCLUSIONS

We concluded that 1) BSFL do not naturally contain VD2 or VD3, or their content are below the detection limits of our method of analysis. 2) BSFL bioaccumulate ergosterol when reared on a substrate rich in this compound. 3) Exposure of BSFL to UV-B allows the conversion of ergosterol present in these larvae into VD2 and the production of VD3, likely from 7-dehydrocholesterol naturally present in the larvae as in other animals. Note that the concentration of VD2 + VD3 in the larvae was about 23 times higher than that reported for the richest natural source of VD, i.e. cod liver oil. Thus, the concentration of VD found in the larvae classify them as a food, intended for animal feed, rich in VD. This procedure has been patented (PCT/EP2024/074854).

CONFLICTS OF INTERESTS

Damien Sabatier is CEO of the BioMiMetiC company. This company conducts research and development activities aimed at valorizing insect-based bioconversion of a wide variety of organic materials generated at all

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levels of the food value chain.F Charles has no conflict of interestL Morrand-Laffargue has no conflict of interestP Borel has no conflict of interest

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OAP8_02

MICROALGAE AS MORE SUSTAINABLE AND AFFORDABLE MICRONUTRIENT-RICH SOURCES FOR HUMAN NUTRITION AND HEALTH

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BACKGROUND AND OBJECTIVES

Micronutrient deficiencies remain common global nutritional problems. Iron-deficiency anaemia (IDA) is the most common global nutritional deficiency, affecting >1 billion people. Dietary intervention is the best strategy to overcome IDA. Animal-based foods with high amounts of highly bioavailable iron are expensive and poorly consumed by vegetarians/vegans. Iron absorption from conventional plant-based food is low due to overall low (bioavailable) iron and commonly present iron-uptake inhibitors. Novel food formulations or sources with high contents of bioavailable iron are urgently needed to prevent IDA and its adverse consequences. Microalgae are small unicellular microorganisms that could contain high amount of minerals but are poorly studied in micronutrient deficiencies treatment.

METHODS

At ETH Zurich, we are building a joint strategic research line in Microalgae in Human Nutrition and Health with two laboratories to investigate the bioaccessibility, bioavailability, and bioactivity of minerals from different microalgae using *in vitro*, *ex vivo*, and *in vivo* methodologies. Different processing techniques are applied to increase iron bioaccessibility. Absorption trials in humans will be designed and performed based on the RESULTS from the above experiments.

RESULTS

Microalgae are rich in minerals such as iron, zinc, and calcium. For instance, microalgae could contain hundred times more iron (~2000 ppm) compared to beef, a commonly accepted iron-rich food. In addition, microalgae are rich in ascorbic acid, which is an important iron absorption enhancer. The bioaccessibility of microalgae iron could reach 83% based on *in vitro* assessment. Microalgae-derived iron can be absorbed well in human cell and animal models. Iron from the microalga *Spirulina* could have a higher bioavailability compared to ferrous sulfate.

CONCLUSIONS

Microalgae are promising in IDA treatment as more sustainable and affordable sources. The outcome of this research will provide insight on using microalgae as mineral supplements or protein-rich novel foods with highly bioavailable iron to control anaemia.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP8_03

ANALYSIS OF NUCLEOTIDE CONCENTRATION TRAJECTORIES OVER LACTATION IN HUMAN MILK AND INFLUENCING FACTORS

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BACKGROUND AND OBJECTIVES

Nucleotides play a crucial role in the growth and development of infants. The study of nucleotide concentration trajectories in human milk and the factors that influence them can provide insights into the nutritional management of breastfeeding mothers.

METHODS

A total of 1517 lactating mothers were enrolled, and 2235 human milk samples were collected from 0 to 400 days postpartum. Among these, 216 lactating mothers provided longitudinal milk samples at three stages: 0-5 days (colostrum milk, CM), 10-15 days (transitional milk, TM), and 40-45 days (mature milk, MM1). In addition, a further 347 mature milk samples were collected at 40-45 days, 641 at 200-240 days (MM2) and 599 at 300-400 days (MM3) as part of a cross-sectional study. The levels of human milk nucleotides, including cytidine monophosphate (CMP), uridine monophosphate (UMP), guanosine monophosphate (GMP) and adenosine monophosphate (AMP), were determined at different stages of lactation using HPLC, and the total potentially available nucleosides (TPAN) were calculated.

RESULTS

Maternal parity history, mode of delivery and pre-pregnancy BMI had no effect on human milk nucleotides, but lactation period and dietary pattern had an effect on human milk nucleotide concentrations. GMP and AMP decreased over time, while UMP, CMP and TPAN decreased during the TM stage, and then increased in MM1. Factorial analysis showed that lactation time affected all human milk nucleotides, and an interaction between lactation time and dietary pattern was observed for GMP and AMP. Further analysis showed that dietary patterns influenced nucleotide levels in later stages of lactation (MM2 and MM3), whereas nucleotide levels in CM were unaffected by diet. Mothers who consumed the Beans-Nuts dietary pattern exhibited the highest nucleotide levels in their mature milk, followed by those who consumed the Potato-Vegetable dietary pattern.

CONCLUSIONS

There was an interaction between dietary pattern and lactation time on human milk nucleotide. The Beans-Nuts dietary pattern resulted in increased nucleotide levels in late-term milk, but not in colostrum or early maturing milk.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP8_04

HEPATIC GPCPD1 ACTIVITY-DRIVEN CHOLINE UTILIZATION LINKS TO ENERGY METABOLISM

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BACKGROUND AND OBJECTIVES

Choline is an essential nutrient for cellular function such as phosphatidylcholine (PC) synthesis, neuronal development, and one-carbon metabolism. Choline can be obtained through dietary intake or synthesized endogenously via the PC hydrolysis pathway. The liver, as the central organ of choline metabolism, is pivotal in maintaining systemic choline homeostasis. Gpcpd1 was previously identified as an intracellular enzyme that converts glycerophosphocholine (GPC) to choline *in vitro*, however, its potential role in endogenous choline production remains poorly understood. In this study, we generated liver-specific Gpcpd1-deficient mice (LKO) and investigated the regulatory roles of Gpcpd1 for choline and one-carbon metabolisms in liver and its impact on energy homeostasis.

METHODS

LKO mice were generated by crossing Gpcpd1-floxed mice, produced using the CRISPR-Cas9 system, with mice expressing Cre recombinase specifically in hepatocytes. Primary hepatocytes were isolated from LKO mice to investigate the impact of Gpcpd1 on choline metabolism. Liver tissue from LKO mice was analyzed using DNA microarray and metabolomics to assess its metabolite changes. Male LKO mice were subjected to fasting model (24h and 48h fasting) and refeeding model (24h fasting followed by 6h refeeding) to evaluate feeding behavior and metabolic alterations.

RESULTS

Liver of LKO mice showed GPC accumulation, betaine depletion, and reduced methylation potential as indicated by decreased SAM/SAH ratio and increased fgf21 mRNA level. Although there is no change in hepatic choline level between wild-type (WT) and LKO mice, primary hepatocytes from LKO mice showed lower choline levels compared with those of WT mice. During fasting, hepatic Gpcpd1 expression of WT mice increased accompanied by hepatic GPC degradation. In the fasting experiment, LKO mice exhibited reduced levels of branched-chain amino acids (BCAAs) and elevated levels of dihydroxyacetone phosphate (DHAP) and glycerol-3-phosphate (G3P), along with reduced blood ALT and AST levels. Notably, LKO mice gained more body weight than WT mice during refeeding.

CONCLUSIONS

These findings suggest Gpcpd1 activity regulates choline metabolism, one carbon metabolism, and energy metabolism, offering insights into the mechanistic crosstalk between these metabolisms and metabolic adaptations to energy deprivation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP8_05

THE MECHANISM OF SULFORAPHANE TARGETING CALCIUM ION-GSN SIGNALING AXIS TO REGULATE MITOCHONDRIAL HOMEOSTASIS AND IMPROVE LIPID METABOLISM DISORDERS

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BACKGROUND AND OBJECTIVES

Mitochondria are the sites of lipolysis and their ability to take up Ca2+ regulates mitochondrial dynamic balance. In our previous study, sulforaphane (SFN) could reduce triglyceride (TG) content. The mechanism of SFN targeting Ca2+-Gelsolin (GSN) signaling axis to regulate mitochondrial homeostasis to improve lipid metabolism was studied.

METHODS

The associations of serum Ca2+ level with the prevalence of non-alcoholic fatty liver disease (NAFLD) was examined using the National Health and Nutrition Examination Survey (NHANES). The causal relationship between Ca2+ and NAFLD was detected by two-sample Mendelian Randomization. A double-blind, randomized controlled trial using broccoli seed extract tablets rich in SFN on NAFLD patients was conducted and plasma proteomics was analyzed. The NAFLD mice model was established with methionine-choline deficient (MCD) diet. ALM12 hepatocytes was induced by mixed fatty acids (FA) and GSN Ca2+-binding site mutant cell lines were constructed and treated with 10 μmol/L SFN.

RESULTS

The serum Ca2+ was positively associated with higher risk of NAFLD. Genetically predicted high levels of serum Ca2+ were consistently associated with increased risk of NAFLD. Glutamyltransferase, alanine transaminase and serum Ca2+ levels decreased in NAFLD patients treated with SFN. Ca2+ has mediating effect on the association between SFN and TG. After SFN intervention in NAFLD patients, the levels of Ca2+-gated channel proteins decreased; mitochondrial fusion proteins and actin increased by plasma proteomics. SFN increased the number of tubular mitochondria and mitochondria fusion protein expression, while decreased fission protein in MCE mice; improved fatty acids oxidation (FAO) capacity. The differential proteins after SFN intervention were mainly concentrated in the actin and mitochondrial outer membrane protein in crude mitochondria; GSN was more prominent. SFN decreased mitochondrial Ca2+ level, the colocalization coefficient of mitochondria and GSN, and mitochondrial fission protein, while increased fusion protein. The cleavage F-actin mitochondrial skeleton wave disappeared in GSN overexpression cell, resulting in the accumulation of fused mitochondria. After GSN-G6 Ca2+-binding site mutation, the activity of cleaved F-actin was enhanced and the mitochondrial kinetic cycle was inhibited.

CONCLUSIONS

High levels of serum Ca2+ may be a potential risk factor for NAFLD and SFN intervention could effectively improve NAFLD. SFN targets the Ca2+ binding site of GSN to activated the cleavage of F-actin, thereby regulating the mitochondrial dynamic balance to promote FAO.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP8_06

EFFECTS OF DIETARY GERANYLGERANIOL SUPPLEMENTATION ON PAIN-ASSOCIATED BEHAVIORS, MITOCHONDRIAL HOMEOSTASIS, AND NEUROINFLAMMATION, BUT NOT GUT MICROBIOME, IN STREPTOZOTOCIN-INDUCED DIABETIC RATS

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BACKGROUND AND OBJECTIVES

Growing evidence highlights the links between diabetic neuropathy (DNP), gut microbiota, mitochondrial homeostasis and neuroinflammation in colon and spinal cord. Geranylgeraniol (GG) shows neuroprotective capacity. We examined the effects of GG on pain-associated behaviors, gut microbiota, and mitochondrial homeostasis in DNP rats.

METHODS

33 male rats were randomly divided into 3 groups: control group (low-fat diet), DPN group (high-fat diet plus single dose of streptozotocin), and DPN+GG at 800 mg/kg in diet for 6 weeks. Von Frey test and elevated plus maze were used to assess nocifensive responses and anxiety-like behavior, respectively. Fecal samples were collected for microbiota composition analysis using 16S rRNA gene sequencing and analyzed by QIIME 2. The mRNA expression levels of tight junction protein, mitochondrial homeostasis, and neuroinflammation were measured in the colon and spinal cord using qRT-PCR. Data were analyzed statistically.

RESULTS

At the end of the study, GG supplementation mitigated mechanical hypersensitivity and anxiety-like behavior of rats with DNP. There were no significant differences in the alpha-diversity and beta-diversity of gut microbiome among all three groups. Relative to the control group, the DNP group had increased abundance of *Clostridium sensu stricto 1*, but decreased abundance of *Peptococcaceae*. GG supplementation into the diet did not influence any abundance of gut microbiome composition in the DNP rats. Relative to DNP group, the DNP+GG group had (i) increased claudin-3 (tight junction protein) and (ii) decreased mitochondrial fusion-1 mRNA expression in the colon, but not in the spinal cord. Relative to the DNP group, the DNP+GG group had (i) increased peroxisome proliferator-activated receptor-γ coactivator-1α (mitochondrial biogenesis and energy metabolism) and (ii) decreased mitochondrial fission protein 1 mRNA expression in the spinal cord, but not in the colon. GG increased glial fibrillary acidic protein (mitochondrial function/biogenesis), while it did not affect PTEM-induced kinase 1 (mitophagy) mRNA expression in the colon and spinal cord of DNP rats. GG suppressed TNF-α mRNA expression levels in the colon and NFkB mRNA expression in the spinal cord of DNP rats.

CONCLUSIONS

GG supplementation reduced DNP pain-associated behaviors, improved intestinal integrity, favored mitochondrial homeostasis, and suppressed neuroinflammation in the animals without affecting the gut microbiome.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP8_07

MAPPING THE DISPARITIES: SEVERE AND EXTREME CHILD GROWTH FAILURE ACROSS SOUTH AND SOUTHEAST ASIA

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BACKGROUND AND OBJECTIVES

The elimination of child growth failure (CGF), encompassing stunting, wasting, and underweight, is a global target to be achieved by 2030. Identifying vulnerable geographic regions and populations within these areas is essential for the development and delivery of targeted interventions to mitigate CGF. This study investigated disparities in overall, severe, and extreme CGF between and within countries in South and Southeast Asia (SSEA).

METHODS

We utilized population-based, nationally representative Demographic and Health Survey (DHS) data collected between 2014 and 2021 from eight SSEA countries: Bangladesh, Cambodia, India, Maldives, Myanmar, Nepal, Pakistan, and Timor-Leste. The analysis included data from 243,805 children under five years of age from both sexes. Absolute and relative inequalities were quantified, and concentration indices were computed to assess disparities.

RESULTS

Between 2014 and 2021, 34.8% of children in SSEA were stunted, 13.7% were severely stunted, and 4.5% were extremely stunted. Additionally, 15.5% of children were wasted, 4.3% were severely wasted, and 1.5% were extremely wasted. Underweight prevalence was 30.4%, with 8.8% classified as severely underweight and 1.8% as extremely underweight. Timor-Leste exhibited the highest prevalence of CGF across all severity categories. Within-country disparities were evident, with the highest prevalence of extreme stunting observed in the Ainaro division of Timor-Leste (18.7%). Children from poorer socioeconomic backgrounds and rural areas consistently experienced higher rates of CGF across all countries, with the exception of the Maldives. Socioeconomic and geographic inequalities in CGF were more pronounced at sub-national levels.

CONCLUSIONS

Substantial variability in CGF was observed between and within countries in SSEA. The implementation and reinforcement of targeted nutrition interventions are imperative, particularly in high-risk regions and among vulnerable populations, to address the persistent disparities in child growth outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP8_09

EXPLORING NUTRITION AND AGRI-FOOD EDUCATORS' KNOWLEDGE OF FOOD SUSTAINABILITY: INSIGHTS TO ADDRESS CLIMATE CHANGE AND SUSTAINABILITY CHALLENGES

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BACKGROUND AND OBJECTIVES

Education is pivotal in shaping a future geared toward achieving climate neutrality and cultivating agents of change capable of addressing current sustainability challenges. The depth of educators' understanding of food sustainability significantly influences how effectively they integrate it into programs and the emphasis placed on its importance. The objective of this study was to examine the knowledge and understanding of food sustainability among nutrition and agri-food educators in Europe. This study was part of a joint European-funded project (2023-1-IE01-KA220-VET-00156916: Train to Sustain – upskilling educators on food sustainability priorities).

METHODS

Following ethical approval, a survey was distributed to nutrition and agri-food educators across the project partner countries of Ireland, Slovenia, Poland, and Italy. Data were collated and analysed using both qualitative and quantitative methodologies to gain a comprehensive understanding of the educators' knowledge of food sustainability.

RESULTS

A total of 123 nutrition and agri-food educators participated in the survey. 81% (n=100 participants; 68 females) of respondents strongly agreed or agreed that they fully understood the term "food sustainability." 97% of respondents believed it was either extremely important (52%) or somewhat important (45%) to include food sustainability in educational programs. Despite this, only 62% of the programs taught by these respondents currently incorporate food sustainability into their curricula. This disparity highlights a gap between perceived importance and actual implementation in education. The data also offered insights into educators' perceptions of food sustainability. Two primary themes were identified: 1 environmental sustainability and 2 social sustainability. Participants referred to producing food in an environmentally friendly way, linking this to achieving zero waste. The qualitative analysis also highlighted the significance of ensuring societal access to healthy food, focusing on food security. However, there was limited mention of economic and cultural sustainability, highlighting a potential gap in educators' understanding of these areas.

CONCLUSIONS

This study highlights the importance of ensuring that nutrition and agri-food educators possess a comprehensive understanding of food sustainability. This foundational knowledge is crucial for adapting and advancing food and nutrition education, which can have a significant impact on climate change mitigation and addressing sustainability challenges.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 20 - BASIC RESEARCH IN NUTRITION

OAP20_02

PROTEIN INTAKE AND QUALITY AMONG NEW ZEALAND VEGANS: INSIGHTS FROM BASELINE ASSESSMENTS AND TEMPORAL MEAL PATTERNS

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BACKGROUND AND OBJECTIVES

The restrictive nature of a vegan diet is associated with risks of indispensable amino acid (IAA) deficiencies, as plant-based proteins provide lower utilisable IAAs. Since IAAs cannot be synthesized endogenously and excess is oxidized in the presence of limiting AAs, evenly distributed protein with synchronised delivery of all IAAs in meals is crucial for optimal metabolism. This study aims to quantify digestibility-adjusted protein and IAA intake, compared to body requirements, and evaluate the temporal distribution across the day.

METHODS

Dietary intake data was obtained through a four-day food diary from adult vegans in New Zealand, who have followed a vegan diet for at least two years (Ethics: HDEC 2022 EXP 12312). Protein and IAA composition of all foods were matched to food composition data from New Zealand FoodFiles and the USDA, and adjusted for True Ileal Digestibility. Time-series clustering was used to objectively classify vegan dietary data into specific clusters and analysed for protein and amino acid distribution as a function of time.

RESULTS

Mean protein intakes for males and females were 0.99 and 0.81 g/kg of body weight /day, respectively, but a quarter from each group were below the Estimated Average Requirement for protein. When adjusted to individual body weight, average IAA intakes were above daily requirements, but lysine just met requirements at 31.2 mg/kg of body weight/day (reference: 30 mg/kg/d). Mean total protein per eating occasion (EO) is 11.1g, with 93.5% of the cohort consuming below 20g of total protein per EO. Higher protein and IAA intake occurred at later parts of the day. Clustering produced three distinct groups, segregated mainly by total protein intake (cluster 1 = 8.2g of protein, cluster 2 = 15.9g, cluster 3 = 30.0g). Among the IAAs, lysine and leucine were at least 4x higher in cluster 3 than cluster 1. Legumes and pulses contributed the largest proportion of total protein and lysine intake in clusters 2 and 3 while cluster 1 had more balanced contribution from different food groups.

CONCLUSIONS

Protein and IAA intake were unevenly distributed throughout the day in this vegan cohort and generally below selected protein reference values of 20 g per EO, particularly for cluster 1. Lysine was the most limiting IAA supplied from the overall vegan diet of the cohort, but just met daily requirements when adjusted to individual body weight. Increasing the intake of legumes and pulses could increase total protein and IAA quantities but must be balanced within the context of other micronutrients. Further exploration of plant protein combinations in cluster 3 could inform recommendations to optimise protein quality in vegan diets.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP20_03

POLYPHENOLS AS MODULATORS OF THE BMP SIGNALING PATHWAY TO COUNTER COLORECTAL CANCER INITIATION

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BACKGROUND AND OBJECTIVES

The Bone Morphogenetic Protein (BMP) signaling pathway is today known as playing a crucial role in inhibiting the initiation/promotion of colorectal cancer (CRC) (*1,2*). In the colon, subepithelial fibroblasts and colonocytes represent the main BMP ligand-producing cells (*1,3,4*). To date, polyphenols are the only nutritional factors known to modulate the BMP pathway, but related to bone metabolism (*5,6*). The aim of our study was to determine (a) whether certain polyphenols were able to modulate the BMP pathway at the intestinal level and (b) whether they could prevent colonocyte transformation induced by 4-hydroxynonenal (HNE), a product of lipid peroxidation suspected to be involved in CRC development.

METHODS

Ten polyphenols were tested on normal colonocytes (Co) and fibroblasts (nF) from the same mouse colon. Expression of BMP pathway players was analyzed by immunofluorescence and RT-qPCR. We then assessed the ability of a selected polyphenol to inhibit colonocyte transformation induced by HNE using a soft agar assay that evaluates the ability of Co cells to grow without anchoring, a characteristic of transformed cells. For this purpose, we treated Co and nF cells both in mono and coculture during three weeks with HNE (5 µM) and/or the selected polyphenol (10 µM) continually.

RESULTS

Apigenin, a flavonoid present in fruits, spices and vegetables, was selected for its ability to increase BMP4 ligand production in nF cells (+650% vs. control, $p < 0.0001$) and to decrease gene expression of GREM1, a BMP antagonist. The soft agar assay showed that pretreatment with apigenin protected colonocytes from HNE-induced transformation ($p < 0.0001$). A similar result was observed with Co cells pretreated in coculture with fibroblasts. The use of a potent inhibitor of the BMP type I receptor (K02288; 500 nM) on monocultured Co cells demonstrated the involvement of the BMP pathway in the protective effect of apigenin. It is very interesting to note that the soft agar assay performed in the presence of fibroblasts pretreated with apigenin, HNE and K02288 also amplified the anchorage-independent growth ability of colonocytes compared to the presence of fibroblasts pretreated only with apigenin and HNE.

CONCLUSIONS

All these data suggest that apigenin, via its action on the BMP signaling pathway, could play a major protective role in the initial stages of colorectal carcinogenesis. This polyphenol, present in our diet, therefore represents a particularly relevant molecule that could lead to the development of new nutritional strategies for the prevention of CRC.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP20_06

REINFORCING INTEGRATED MANAGEMENT OF ACUTE MALNUTRITION

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BACKGROUND AND OBJECTIVES

Severely acute malnourished children face a mortality risk 5 to 20 times higher than well-nourished peers. Despite a decline in wasting prevalence in Nepal from 15% to 8%, provincial disparities persist. The IMAM program, reaching only 30% of those in need, requires updates to address these gaps and improve child health outcomes.

This project seeks to restress the importance of quality IMAM program among different stakeholders engaged at the province level. The specific objectives include: (1) identification of the gaps in implementation of IMAM services at the province level, (2) development of provincial level recommendations for ensuring quality of IMAM program nationally, and (3) supporting the Government for updating the existing National IMAM Guideline based on the key findings from the gap analysis and the recently released WHO guidelines 2023.

METHODS

The gap analysis employed a tool adapted from the Health System Strengthening (HSS) diagnosis tool, developed by ACF at the global level. This was implemented across all seven provinces in Nepal. KII were conducted to complement the gap analysis findings, and information was triangulated through desk reviews of national policies, research reports, and health data (e.g., NDHS 2016 and 2022, HMIS, MSNP II). The findings were aligned with WHO guidelines on the prevention and management of acute malnutrition in children under 5 years.

RESULTS

The analysis identified significant issues across seven provinces, categorized by six health system building blocks and 22 sub-building blocks. Major challenges were found in service delivery, human resources, and health information systems. Governance was generally adequate, except in Madhesh and Koshi Provinces, where policy formulation and assessment capacities were weak. Financial resources were sufficient in most provinces, but Koshi struggled with both financial and human resources. Supply chain adequacy varied, with Sudurpashchim and Karnali performing well, while others faced shortages. Short, medium, and long-term action plans were developed, along with detailed recommendations to support the revision of the IMAM guidelines.

CONCLUSIONS

The gap analysis underscores the need for a multisectoral approach to the IMAM program, emphasizing comprehensive policy revisions and targeted interventions to address identified gaps. These findings will inform the update of the IMAM guidelines, ensuring more effective implementation and contributing to better health outcomes for children across Nepal.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP20_07

QUALITY ASSESSMENT OF EFFERVESCENT FOOD SUPPLEMENTS ON THE SLOVENIAN MARKET: COMPLIANCE WITH DECLARED NUTRIENT CONTENT

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BACKGROUND AND OBJECTIVES

The popularity of food supplements has grown significantly in Slovenia, where they are increasingly used to meet daily nutrient needs. However, concerns arise regarding their quality, safety, and labeling accuracy. Effervescent tablets (ET) are a food supplement known for their convenience and palatability. This study aimed to evaluate the compliance of declared contents of selected micronutrients (vitamins D, B12, C, and minerals zinc, calcium, magnesium, and iron) in ET with actual composition determined through laboratory analysis.

METHODS

A detailed review of the packaging for 71 samples was conducted, focusing on declared ingredients, chemical forms of micronutrients, and the use of nutrition and health claims. Laboratory analyses were used to evaluate nutrient content.

RESULTS

The analysis revealed discrepancies in nutrient content, with 11% of samples exceeding permitting tolerance limits (80-150 %). Vitamin D showed the highest non-compliance, with 24% of samples outside the acceptable range. Furthermore, 55% of ET samples contained at least one micronutrient exceeding the reference daily intake, while 18% surpassed the upper tolerable intake level, raising potential safety concerns. Most ET samples (86%) declared the chemical forms of added micronutrients, which is compliant with EU regulations, whereas 14% failed to specify these forms. Additionally, 79% of samples featured health claims, yet 13% of these claims did not meet regulatory requirements, indicating potential issues in labeling practices.

CONCLUSIONS

The findings highlight gaps in the quality control and labeling accuracy of food supplements in the Slovenian market, particularly among effervescent tablets. These gaps underscore the need for more stringent oversight and improved regulatory frameworks to ensure that product labeling accurately reflects nutrient content and complies with established safety standards. Transparent and precise labeling practices are essential to prevent consumer misinformation and support public health. Addressing these issues requires regular and systematic testing of food supplement products, adherence to legislative standards, and enhanced quality monitoring processes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP20_08

DOES LACTIC ACID-RICH SOURDOUGH BREAD IMPROVE APPETITE REGULATION COMPARED TO YEAST BREAD? A RANDOMIZED, DOUBLE-BLIND CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Sourdough bread has been linked to better glucose and appetite regulation, potentially due to the organic acids produced during fermentation. This study aimed to compare the effects of wholemeal sourdough bread (WSB), rich in lactic acid, on energy intake, satiety, gastric emptying, and glucose and C-peptide responses, with wholemeal yeast bread (WYB).

METHODS

Forty-four normal-weight participants (age: 30 ± 10 years; BMI: 23 ± 2 kg/m²) took part in a double-blind, randomized crossover trial. The trial consisted of two study visits, each separated by one week. During each visit, gastric emptying, subjective appetite, and glucose and C-peptide concentrations were measured over a four-hour period. Afterward, ad-libitum energy intake was assessed.

RESULTS

Although there was no significant difference in ad-libitum energy intake after bread consumption ($p = 0.068$), WSB led to significantly lower hunger ($p < 0.001$), higher fullness ($p < 0.001$), reduced desire to eat ($p < 0.001$), and lower prospective food consumption ($p < 0.001$) compared to WYB. WSB also resulted in slower gastric emptying rate ($p = 0.002$), reduced glucose response between 15-30 minutes ($p < 0.05$), and lower C-peptide response between 15-90 minutes ($p < 0.05$) after consumption compared to WYB.

CONCLUSIONS

Consumption of WSB, rich in lactic acid, led to a slower gastric emptying rate, lower early glucose and C-peptide responses, and a slight increase in satiety compared to WYB. However, it did not impact ad-libitum energy intake at the next meal, compared to WYB.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 28 - BASIC RESEARCH IN NUTRITION

OAP28_02

NUCLEOTIDES AS AN ANTI-AGING SUPPLEMENTATION IN OLDER ADULTS（TALENTS）: A RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Aging impairs nutrient metabolism and accelerates biological aging, negatively affecting health and longevity. The targeting Aging and Longevity with Exogenous Nucleotides (TALENTs) trial aimed to explore whether nucleotides supplementation (NTs) could delay biological aging and improve health outcomes in older adults.

METHODS

The trial was a 19-week, double-blind, randomized, placebo-controlled study in Chengdu, China, with 121 elderly participant (60-70 years). Participants were randomly assigned in a 1:1 ratio to receive either NTs (1.2 g/day) or a placebo group by an independent researcher applying a computer-generated sequence. Primary outcomes included DNA methylation median age (Median DNAmAge) and leukocyte telomere length (LTL). Secondary outcomes assessed metabolic health and aging biomarkers. Other observational data, such as body composition and comprehensive geriatric questionnaire assessment were also collected. Safety was assessed through monitoring adverse events and routine clinical markers. Data were collected at baseline, week 11, and week 19. The study is registered with ClinicalTrials.gov, NCT05243108.

RESULTS

The mean age of the participants was 65.65 ([SD] 2.59) years and 82 (67.21%) of them were women. NTs significantly reduced Median DNAmAge compared to placebo (β = -3.08 years, 95% CI: -5.07 to -1.10, P = 0.0023), suggesting an anti-aging effect. LTL showed no significant difference between groups (β =0.11, 95% CI: -0.06 to 0.28, P = 0.19). Insulin sensitivity improved in NTs group, with a significant reduction in HOMA-IR (β =-0.45, 95% CI: -0.86 to -0.04, P = 0.033). There were no significant changes in any of the other secondary outcomes between groups. Observational data indicated an increase in skeletal muscle mass (β = 0.50 kg, CI: 0.01 to 1.00, P = 0.046) as well as reductions in trunk fat mass (β = -0.33 kg, CI: -0.64 to -0.01, P = 0.044) and visceral fat grade (β = -0.40, CI: -0.73 to -0.08, P = 0.015). No severe adverse events were reported. No significant changes in liver or kidney function, nor tumor markers.

CONCLUSIONS

NTs supplementation is safe and may promote healthy aging by reducing DNAmAge and improving insulin sensitivity with a well-tolerated safety profile. Observed changes in body composition, such as increased muscle mass and reduced trunk and visceral fat, support potential benefits. Further research is needed to confirm these findings and assess long-term effects.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP28_03

EX VIVO STUDY ON THE PREBIOTIC EFFECTS OF CITRUS PECTIN IN HEALTHY ADULTS

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BACKGROUND AND OBJECTIVES

Upcycled citrus pectin, derived from citrus peels, is a complex polysaccharide formed of a linear chain of galacturonic acid (homogalacturonan) and branched chains (rhamnogalacturonan I and II), that is mostly known for its functional properties in foods. Recent literature also highlights an interesting prebiotic potential in humans (Pascale et al, 2022; Gu et al, 2023). Due to the complexity of the molecule, more studies are needed to fine-tune the structure-function relationship, including variations of its molecular weight, and better estimate the efficient dose in healthy adults.

METHODS

The *ex vivo* SIFR® fermentation technology (Van den Abbeele et al, 2023) was used to study the effects of 5g/L citrus pectins with various molecular weight in comparison to chicory inulin. Faecal samples from 6 healthy adult donors (BMI between 20-25, no antibiotic use for the past 3 months, no use of pre- and probiotics) were used as inoculum in a single-donor study design. The fermentative parameters were evaluated after 48h along with gut microbiome composition (16SrRNA gene) and the gut metabolome (untargeted metabolomics). Samples collected after 48h were also applied to a Caco-2 epithelial layer to measure barrier integrity (TEER) and to THP-1 cells to evaluate cytokine/chemokine response of upon LPS treatment.

RESULTS

Similarly to inulin, all tested pectins induced a significant production of SCFA with a critical role of the molecular weight. Fermentation of pectin was highly oriented towards the production of acetate but also propionate and butyrate, yet slightly lower than inulin. All pectins promoted barrier integrity (higher TEER in absence and presence of LPS) and modulated the immune system (slight increase in IL-6, like inulin). Pectin particularly stimulated the growth of the *Ruminococcaceae* and *Bacteroidaceae* families whereas inulin stimulated *Bifidobacteriaceae* and *Coriobacteriaceae*. Both fibres increased the concentration of various acetylated amino acids. With pectin, *Bacteroidaceae* were also positively correlated with tryptophan-derived and phenolic compounds.

CONCLUSIONS

This *ex vivo* study confirmed that citrus pectin-derived fibres have a prebiotic potential in humans at similar doses as inulin and also have complementary effects as illustrated by a higher acetate production and other bacterial metabolites that may have health benefits. Modulating the molecular weight of pectin can impact its fermentation properties and help to optimize its efficacy in humans and facilitate its use in food and beverage.

CONFLICTS OF INTERESTS

Frederique Respondek is an employee of CP Kelco, producer of pectin for the food industrySune Petersen is an employee of CP Kelco, producer of pectin for the food industry

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OAP28_05

EXAMINATION OF MEASUREMENT CONDITIONS FOR EVALUATING THE DIGESTIBILITY OF CARBOHYDRATES IN FOODS USING THE GR METHOD

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BACKGROUND AND OBJECTIVES

The Glycemic Index (GI) is an in vivo method for predicting postprandial blood glucose levels. However, GI measurement requires blood sampling, posing challenges such as mental stress, high costs, and time constraints. To address these issues, the Glucose Releasing Rate (GR) method was developed by the ILSI Japan GR Project as a simpler screening method to predict glycemic response. This study examines factors influencing the variability of GR measurements, particularly the impact of food moisture content.

METHODS

The GR method involves in vitro simulations of mastication, gastric digestion, pancreatic enzyme activity, and disaccharide breakdown in the small intestine. GR values are expressed as the ratio of glucose concentration at 20 minutes to that at 16 hours. This study reevaluated experimental procedures and investigated the effects of soaking time and water addition during sample preparation.

RESULTS

Variations in GR measurements were influenced by shaking water bath conditions, including temperature and shaking distance, as well as fluctuations in measurements before and after the 16-hour time point.

For low-moisture foods, samples were previously soaked at 37°C for 10 minutes to simulate mixing with saliva. Reducing the soaking time to 1 minute, to account for mastication time before swallowing, yielded RESULTS that were either comparable to or lower than those with 10 minutes of soaking.

CONCLUSIONS

This study identified factors affecting the variability of GR measurements, emphasizing the importance of clearly defined conditions to minimize variability. The GR method mimics mastication by grinding samples, with pre-grinding preparations simulating mixing with saliva. Variations in GR values were observed depending on the amount of saliva simulated and the mastication time.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP28_06

THE SYSTEMIC AVAILABILITY OF SHORT-CHAIN FATTY ACIDS: IMPACT OF SMALL INTESTINAL VERSUS COLONIC DELIVERY

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BACKGROUND AND OBJECTIVES
Fermentation of dietary fibers in the human colon generates short-chain fatty acids (SCFA), which potentially mediate the health benefits associated with fiber intake. The fraction of SCFA that bypasses metabolism in colonocytes and liver and enters unchanged the systemic circulation, is called the systemic availability. Unlike colonic cells, small intestinal enterocytes do not primarily use SCFA as energy source. Therefore, we hypothesized that small intestinal delivery of SCFA RESULTS in a higher systemic availability than colonic delivery.
METHODS

In a randomized, crossover trial with healthy subjects (n=11; age: 28 years; BMI: 22 kg/m²), 13C-labeled SCFA (400 mg 13C-acetate, 300 mg 13C-propionate, 800 mg 13C-butyrate) were administered in the small intestine or the colon using standard capsules or capsules with a colon-delivery coating, respectively. A primed, continuous intravenous infusion containing ²H-labeled SCFA ([$^2H_3$]-acetate: 10 µmol/kg + 20 µmol/kg/h; [$^2H_5$]-propionate: 1 µmol/kg + 2 µmol/kg/h; [$^2H_7$]-butyrate: 0.5 µmol/kg + 1 µmol/kg/h) was administered for 12 hours to assess the clearance of SCFA from the circulation. Postprandial serum samples were collected at regular timepoints for 12 hours. All samples were analyzed for total (labeled + unlabeled) SCFA using gas chromatography-mass spectrometry (GC-MS) after derivatization with 2,4-difluoroanilin. ²H- and 13C-abundances were measured in ether extracts of the serum samples using GC-MS or GC-combustion-isotope ratio mass spectrometry, respectively. The clearance (L/h) was calculated by dividing the ²H-SCFA infusion rate by the ²H-SCFA steady state concentrations. The systemic availability was calculated from the area under the curve of 13C-SCFA concentration over 12 hours, multiplied with the clearance and divided by the administered dose of 13C-SCFA.

RESULTS

13C-SCFA concentrations peaked after 30 min after small intestinal delivery, while colonic delivery resulted in peaks between 200 and 400 min. The systemic availability was not different between small intestinal and colonic delivery (Wilcoxon signed rank test) for acetate (median [IQR]): 41.6 [34.3-51.5%] vs. 37.0% [27.9-49.2%], p = 0.6377), propionate (5.46 [4.91-7.52%] vs. 4.29% [3.65-6.84%], p = 0.2783) and butyrate (1.68% [1.48-1.88%] vs. 1.82 [1.22-2.22%], p = 0.7646).

CONCLUSIONS

The lack of difference does not exclude that a higher fraction of SCFA entered the portal circulation after small intestinal administration and was compensated by increased liver extraction. Thus, the site of administration does not influence the systemic availability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP28_07

MATH ADVANCES NUTRITION RESEARCH: THE CHALLENGE OF DESIGNING MENUS FOR CONTROLLED FEEDING TRIALS

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BACKGROUND AND OBJECTIVES

Controlled feeding trials are an important method for establishing cause-effect relationships between dietary intake and metabolic parameters, risk factors, or health outcomes. In controlled feeding trials, participants are provided with full-day menus for a specified period. These menus must adhere to the trial's nutritional and operational standards. Levels of nutrients under investigation should differ sufficiently between intervention groups, while being consistent across different energy levels within each group. Levels of other key nutrients should be as similar as possible for all participants. Additionally, menus must be both diverse and manageable. Designing these menus is both a nutritional and a computational challenge, heavily reliant on the skills of the research dietitian. The process is highly time consuming, and managing last-minute disruptions poses significant challenges.

METHODS

We developed a mixed integer linear programming model to support the design of menus for controlled feeding trials. The model is demonstrated for a trial that involved consumption of individualized, isoenergetic menus with either a low or a high protein content (1). The model was used in the design of several trials, focusing on e.g. variation in postprandial glucose responses during a fully controlled dietary intervention, during which the participants had to comply with strict 30-minute time windows for food intake during nine weeks (2) and the muscle protein synthetic response in older adults to a vegan diet for which the protein intake had to be very precisely allocated to six meal moments (3).

RESULTS

All menus generated by the model fully comply with the trials' standards. The model accommodates strict nutrient composition ranges and supports the incorporation of complex design features. It is particularly effective in managing contrasts and similarities in key nutrient intake levels across groups and energy levels, even when dealing with numerous nutrients and energy levels. Additionally, the model facilitates the generation of multiple alternative menus and helps to tackle last-minute disruptions. Its flexibility allows for easy adaptation to trials involving different components or nutritional requirements.

CONCLUSIONS

The model helps to design menus for controlled feeding trials in a fast, objective, transparent, and reproducible manner. It significantly facilitates the menu design process, reducing both time and development costs. As such, it advances nutrition research.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP28_08

THE IMPACT OF UVB RADIATION ON ACETYLCHOLINESTERASE INHIBITORY POTENTIAL IN VARIOUS MUSHROOM SPECIES: AN IN VITRO STUDY

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BACKGROUND AND OBJECTIVES

This study aims to investigate the effects of UVB radiation on the acetylcholinesterase (AChE) inhibitory potential of three mushroom species: white button, shiitake, and king oyster.

METHODS

Mushrooms were exposed to three levels of UVB radiation (none, moderate, and high). AChE inhibitory activity was measured using an in vitro enzyme inhibition assay. Data were analyzed to determine the influence of UVB radiation and species-specific responses.

RESULTS

UVB radiation significantly enhanced AChE inhibitory activity in all mushroom species. The highest inhibition levels were observed under high UVB exposure, with shiitake mushrooms showing the most pronounced response. UVB-treated mushrooms demonstrated superior AChE inhibition compared to untreated controls, suggesting increased anti-Alzheimer potential.

CONCLUSIONS

UVB exposure is a promising method for enhancing the neuroprotective properties of edible mushrooms. These findings highlight the potential of UVB-treated mushrooms as functional food ingredients in dietary strategies for neurodegenerative diseases such as Alzheimer's. Further research is recommended to elucidate underlying mechanisms and assess clinical applications.

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CONFLICTS OF INTERESTS
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OAP28_09

ANALYSIS OF THE MICROBIOME AND METABOLOME IN HUMAN BREAST MILK FROM HEALTHY AND DIABETIC MOTHERS IN THE COFFEE-GROWING REGION OF COLOMBIA

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BACKGROUND AND OBJECTIVES

Human breast milk (HBM) contains diverse metabolites and microbiomes essential for infant nutrition. Its composition and microbial abundance are influenced by physiological factors, including gestational diabetes mellitus (GDM), which disrupts both the microbiome and metabolome, affecting infant nutrition. This study compared the microbiome and metabolome profiles of HBM from healthy mothers and those with GDM to identify features influencing dysregulation in the mother-infant dyad.

METHODS

We analyzed biological samples from 20 healthy and 16 GDM mothers, including maternal and infant feces and HBM. Microbiome analysis involved DNA purification, 16S rRNA sequencing of the V3–V4 region, quality filtering, and classification using the SILVA database. For metabolomics, metabolites were extracted, derivatized, and analyzed via GC/MS QTOF, with identification based on retention indices.

RESULTS

Significant differences in gut bacterial abundances were observed between groups. GDM mothers showed reduced Bifidobacterium, Serratia, and Sutterella in their gut, while HBM had lower levels of Sutterella, Serratia, and Lactococcus. Infants of GDM mothers exhibited reduced Bifidobacterium, Lactobacillus, Sutterella, Serratia, Streptococcus, and Veillonella. Metabolomic analysis revealed alterations in glycolysis, gluconeogenesis, valine, leucine, and isoleucine biosynthesis, the citrate cycle (TCA), and pyruvate metabolism pathways in GDM-affected milk.

CONCLUSIONS

These findings suggest that GDM significantly impacts the gut and HBM microbiomes and metabolomes, potentially influencing infant health through disrupted metabolic pathways and microbial profiles.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP 30 - BASIC RESEARCH IN NUTRITION

OAP30_01

ACCURACY OF BODY COMPOSITION ESTIMATION USING BIOELECTRICAL IMPEDANCE ANALYSIS (BIA) – COMPARISONS BETWEEN SEVEN MODELS WITH DUAL ENERGY X-RAY ABSORPTIOMETRY (DXA) –

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BACKGROUND AND OBJECTIVES

An accurate estimation of body composition is important to better understand one's health and nutritional status. Bioelectrical impedance analysis (BIA) is one of the techniques widely used to estimate body composition due to its convenient, time-efficient and non-invasive nature. However, due to its popularity, a wide range of devices of different levels of accuracy is available today. The present study aimed to investigate an accuracy of different BIA devices that vary in numbers of frequencies and electrodes using a dual energy x-ray absorptiometry (DXA) as the reference technique.

METHODS

A total of 52 young Japanese female university students (median age: 20.0 years old, stature: 158.4 ± 5.8 cm, body mass: 52.6 ± 8.1 kg) underwent body composition assessment using DXA (Horizon, Hologic) and seven BIA devices. The BIA devices include 1) hand-to-hand single frequency BIA [SFBIA], 2) foot-to-foot SFBIA, 3) hand-to-foot SFBIA, 4) hand-to-foot dual frequency BIA [DFBIA], 5) hand-to-foot DFBIA with a prediction equation derived from the four-compartment model [DFBIA-4C], 6) a research-use hand-to-foot multi-frequency BIA [MFBIA-R], and 7) a home-use hand-to-foot MFBIA [MFBIA-H]. Assessments by DXA were conducted within one week of assessments using BIA devices.

RESULTS

Participants had percentage body fat (%BF), fat mass (FM) and fat-free mass (FFM) of 31.9 ± 4.8%, 16.6 ± 4.5 kg, and 34.8 ± 4.3 kg respectively from DXA. All BIA devices underestimated %BF compared with DXA. Devices with minimum estimation errors of %BF, FM and FFM were MFBIA-H, MFBIA-R, and DFBIA-4C. These devices had narrower limits of agreement than other devices for %BF (2.0 – 3.1% overestimation and 7.5 – 8.0% underestimation), FM (1.4 – 1.9 kg overestimation and 3.6 – 3.9 kg underestimation), and FFM (4.7 – 5.6 kg overestimation and 0.7 – 1.8 kg underestimation).

CONCLUSIONS

Present study observed differences in accuracy of body composition assessment between different BIA devices, indicating that RESULTS obtained from different BIA devices are not interchangeable. While MFBIA and DFBIA-4C devices showed smaller estimation error, these devices still showed approximately 10% error for %BF and approximately 6 kg for FM and FFM respectively, suggesting a need of caution to interpret the RESULTS.

CONFLICTS OF INTERESTS

One of the BIA devices used in the present study was supplied by TOYO MEDIC Co., Ltd. However, I. K. and S. O. did not involve in data analysis and interpretation of the RESULTS.

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OAP30_03

ALISTIPES INDISTINCTUS WITH POTENTIAL PROBIOTIC CHARACTERISTICS PREVENTS LIPOPOLYSACCHARIDE-INDUCED INTESTINAL BARRIER INJURY

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BACKGROUND AND OBJECTIVES

Alistipes indistinctus (A. indistinctus) has demonstrated a beneficial effect on metabolic disorders, such as hyperglycemia, hyperuricemia, and fatty liver disease, suggesting that it has the potential to be a next-generation probiotic.[1-3] However, whether A. indistinctus meets the criteria of probiotics proposed by International Scientific Association for Probiotics and Prebiotics remains unclear. [4]

METHODS

Germ-free mice were gavaged with live and heat-killed A. indistinctus for one month to determine its colonization and potential effect on mucin production. Differentiated Caco-2 cells, an intestinal monolayer epithelium model, was employed to determine the protective effect of A. indistinctus on intestinal barrier function and amelioration in LPS-induced inflammation.

RESULTS

The survival rate of A. indistinctus in gastric and intestinal fluid was 77.3% and 73.0%, respectively, comparable to most well-known probiotics, such as Bifidobacterium. [5] Similar to other well-known probiotics, A. indistinctus was capable of encoding bile acid hydrolase (BSH), and showed strong BSH activity. [6] Besides, live A. indistinctus could colonize in the mucus layer for one week after single gavage, while long-term treatment of A. indistinctus exerted no adverse effect on liver and kidney function. Moreover, colonization of A. indistinctus led to a 1.8-fold increase in the number of goblet cells, which in turn boosted the formation of thickness of mucus layer. Additionally, co-culture with A. indistinctus enhanced the trans-epithelial electrical resistance value by 12.5%, and substantially reduced the paracellular permeability in Caco-2 cells exposed to LPS. Such an increase in intestinal barrier was accompanied by a 56.5% increase in the expression of zonula occludens-1 and occludin. Mechanistically, A. indistinctus treatment downregulated the expression of pro-inflammatory cytokines, including IL-1β, IL-6, and TNF-α, through suppressing the activity of NF-κB.

CONCLUSIONS

Though more investigations in humans are warranted, our findings provide evidence that A. indistinctus meets the criteria of probiotics and holds potential to be a next-generation of probiotics.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP30_04

CHRONIC ELECTROACUPUNCTURE (EA) TREATMENT IN OBESE MINIPIGS MODIFIED GENE EXPRESSION AND BOLD FMRI BRAIN FUNCTIONAL RESPONSES TO FURTHER EA AND SWEET GUSTATORY STIMULATION IN THE CORTICO-LIMBIC-STRIATAL CIRCUITS

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BACKGROUND AND OBJECTIVES

Electroacupuncture (EA), a modern derivative of Chinese traditional acupuncture, is increasingly used for treating various diseases and especially gastrointestinal disorders. We previously showed in healthy minipigs that acute EA modulated physiological and metabolic parameters of the gut-brain axis compared to basal, sham and control conditions, with promising effects on brain fMRI responses, especially for the Sanwan/Dafengmen (S/D) acupoints (corresponding to human acupoints Shangwan, Zhongwan, Xiawan and Baihui). Here, we investigated the effects of a chronic EA on the brain functions of obese minipigs.

METHODS

Sixteen adult Yucatan minipigs were subjected to a 2-month obesogenic high-fat/high-sucrose diet before either a control (N=8) or chronic EA treatment composed of 12 20-min EA sessions (N=8, S/D stimulation) under general anesthesia. All animals were then subjected to *in vivo* whole-brain BOLD functional magnetic resonance imaging (fMRI) in response to acute EA stimulation or oral sucrose stimulation, as well as to *post mortem* brain tissue gene expression (80 genes) microarray analyses in four regions of interest (prefrontal cortex, striatum, hippocampus, hypothalamus).

RESULTS

Chronic EA in obese minipigs, compared to control, led to different brain responses to further EA or oral sucrose stimulation ($p<0.05$) in the prefrontal cortex (cognitive control), orbitofrontal cortex (hedonic evaluation), dorsal striatum (pleasure, motivation), cingulate cortex (decision making, attention) and hippocampus (learning, memory). Gene expression microarray revealed a region-dependent effect ($p<0.05$) of EA compared to control, with a decreased expression for genes involved in tight junction (CLDN5), fatty acid transport (FATP3) and brain development/maturation (CTNNB1), as well as an increased expression for genes involved in eating and thermogenesis control (NPY, MFSD2A), brain cell communication, survival and differentiation (SYP, GRIN2B, NTF3).

CONCLUSIONS

This study is the first to describe, in a large animal obesity model, the effects of chronic EA on the brain responses to sweet taste and gene expression in relation with brain plasticity and metabolism. Perspectives include the analysis of behavioral and physiological data already acquired. This opens the way to a better understanding of the (electro)acupuncture mechanisms, as well as their clinical use to fight against obesity and its comorbidities.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP30_05

A NOVEL PROTOCOL FOR EXTRACTING DIETARY DERIVED MICRORNAS FROM GASTROINTESTINAL DIGESTA

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BACKGROUND AND OBJECTIVES

Recent years have shown multiple reports of dietary derived miRNAs surviving gastrointestinal digestion (1). These have later been detected in diverse body compartments, as well as in the circulatory system and feces (2,3). Considering the relevance of these reports, we have optimized an existing method of RNA extraction to enable researchers to purify and study miRNAs present in the gastrointestinal digesta as assessed by spike-ins and naturally occurring miRNAs.

METHODS

Using the bioaccessible phase of gastrointestinal digesta obtained from the INFOGEST 2.0 method (4), we have developed a miRNA purification protocol (5). This new method is based on a combination of lysis and precipitation buffers with the addition of a novel step, which decreases cross reactivity of the gastrointestinal digesta with downstream processes. This step consists in the addition of a reagent prior to RNA extraction that reduces RNAse activity from the digesta and chelates ions that would otherwise precipitate with RNA. The RNA is then further purified using a silica column. In the following, we benchmarked our protocol with other METHODS available. This included using a combination of spiked-in miRNAs and native miRNA from food matrices to validate the protocol. Assessment of miRNA extraction quality was done through qPCR.

RESULTS

The optimized protocol purifies miRNAs from gastrointestinal digesta in a reproducible manner (SD= 0.8 and 1.5 cycles respectively for spike-ins and native miRNAs), while allowing a relative large input volume (600 µl). Furthermore, it overcomes limitations observed with other commonly used techniques, such as cross reactivity derived from the gastrointestinal digesta composition or degradation of samples caused by RNAses present within the GID. The method, which allows for downstream applications such as RT-qPCR is significantly better in preserving RNA from the gastrointestinal digesta (i.e. recovery, $p<0.05$) than existing METHODS for miRNA extraction, even at low concentrations (ca. 100 copies / µl).

CONCLUSIONS

The current method provides a tool for researchers to study dietary derived miRNAs as novel food bioactives and biomarkers of food intake in a quick (<2 h) and reliable manner.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP30_06

VALIDATION OF THE INTERVIEWER-BASED 24-H DIETARY RECALL APP 'CATCH-24' FOR DIETARY ASSESSMENT IN LMIC

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BACKGROUND AND OBJECTIVES

Dietary assessment in low- and middle-income countries (LMIC) is difficult due to the unavailability of effective tools and population specific databases, making the preparation and execution time consuming and burdensome for both researchers and participants. Catch-24, an interviewer-based 24-h dietary recall (24hR) tablet app, is specifically developed for use in small-scale studies in LMIC as it can easily be adapted to new study areas and requires minimal data preparation. This study aimed to evaluate the intake of energy and nutrients assessed with Catch-24, against traditional pen-paper 24hRs and independent urinary recovery markers.

METHODS

Dietary intake was assessed in a cross-sectional study in urban and rural areas of two districts in Zambia. In total, 357 women (18-49 year) completed 6 non-consecutive 24hRs on randomly non-consecutive days, over a period of 3 weeks (3x 24hRs with Catch-24, 3x 24hRs with pen-paper). A subgroup of 52 women completed 24-h urine collection to determine urinary nitrogen excretion. Perceived usability of Catch-24, by the interviewers, was assessed using an evaluation questionnaire.

RESULTS

According to the interviewers, Catch-24 was easy-to-use and the app supported the structure of the interview. Average intakes of energy and nutrients (except alcohol) were slightly lower when assessed with Catch-24 24hRs compared to pen-paper 24hRs (energy 2974±951 kcal vs 3173±1072 kcal, nutrients e.g. protein 78.3±28.8 g vs 84.8±29.7 g; fat 77.7±34.3 g vs 85.0±35.6 g; carbohydrates 460±156 g vs 484±180 g). Urinary protein was lower than dietary protein intake assessed with pen-paper 24hRs. Correlation coefficients between 24hR METHODS ranged from 0.40 to 0.70 for energy and macro nutrients and from 0.29 to 0.51 for micro nutrients, except for calcium (0.23). Reproducibility for intake of energy and nutrients was comparable for both 24hR METHODS.

CONCLUSIONS

Dietary intake assessed with Catch-24 was slightly lower for energy and almost all nutrients, compared to pen-paper 24hRs with predominantly acceptable to good correlations. Subsequently, pen-paper 24hRs seem to overestimate compared to urinary protein, which may suggest that Catch-24 24hRs are more accurate than pen-paper 24hRs. Overall, Catch-24 was easy-to-use and guided the interview process, and therefore supported the overall estimation of dietary intake. Catch-24 has the potential to significantly reduce the researcher burden in diet-related studies in LMIC and is a valid tool to assess dietary intake.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP30_07

ENHANCEMENTS TO THE NATIONAL SCHOOL NUTRITION PROGRAMME (NSNP) TO DIVERSIFY MENUS AND IMPROVE MEAL QUALITY, SERVICE, AND FACILITIES IN SOUTH AFRICA

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BACKGROUND AND OBJECTIVES

In South Africa, the National School Nutrition Program (NSNP) targets food insecurity while enhancing learners' health and performance in school. Even with its success, challenges, including inadequate menu diversity, inconsistent meal quality, and poor infrastructure, still exist. As part of UNICEF's initiative to enhance the school food environment (SFE), an intervention of diversifying NSNP menus was piloted in six public schools. The goal of the intervention was to increase menu variety, improve nutritional content, and utilise more locally sourced, affordable, nutrient-dense ingredients that didn't require much storage space to promote a healthier, sustainable, and efficient school food environment.

METHODS

A mixed-METHODS approach was employed. Stakeholders' perceptions offered qualitative insights into the limitations of NSNP at the baseline, while sensory evaluations collected quantitative data on the developed recipes at the endpoint. Recipes were designed based on expert recommendations, utilising seasonal, local, and indigenous resources to enhance environmental sustainability and reduce reliance on processed ingredients. Recipes were developed to be scalable, economical, and appropriate for educational institutions with limited kitchen resources. Schools received support to establish kitchen gardens so they could utilise the produce in their kitchens. The training of Voluntary Food Handlers (VFHs) and the provision of promotional materials facilitated implementation.

RESULTS

The sensory evaluation of the fifteen newly produced recipes was positively received by professional panellists and learners. Furthermore, four out of six schools are successfully operating their kitchen gardens and utilising the produce to improve the quality of the NSNP meals. The identified barriers include insufficient kitchen facilities, restricted food storage, logistical difficulties in procuring fresh, local products, learner aversion to unfamiliar foods, cultural preferences, and insufficient parental involvement.

CONCLUSIONS

Improving the NSNP by diversifying the menu and incorporating nutritious, locally sourced foods enhances meal quality and satisfaction among learners. The ease of preparation and scalability of recipes provide accessibility for schools with low resources. Capacity-building activities for key stakeholders, collaborations with local farmers, and the development of school gardens can provide a consistent supply of ingredients and enhance the sustainability of programs over the long term.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP30_09

NEW INSIGHT INTO THE PROTEOME AND METHYLPROTEOME OF MITOCHONDRIA-ASSOCIATED MEMBRANES IN HEPATIC STEATOSIS

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BACKGROUND AND OBJECTIVES

The contacts between mitochondria and the endoplasmic reticulum referred as mitochondria-associated membranes (MAMs), have a crucial role in the control of liver metabolic homeostasis. Recent studies have shown that MAMs are decreased in the liver of obese mice. Metabolic dysfunction-associated steatotic liver disease (MASLD) is related to a disruption of methionine cycle, characterized by altered metabolite levels and methylation processes in the liver. We explored the effect of MASL (MASLD first stage) on the hepatic MAM proteome and methylproteome to determine whether these two elements could be connected.

METHODS

C57BL/6JOlaHsd male mice were fed either a standard diet (SD) or a high fat high sucrose diet (HFD) for 14 weeks. Liver MAMs were analyzed by transmission electron microscopy (TEM) and proximity ligation assay (PLA, VDAC1-IP3R1 close contact). Hepatic MAM fractions were isolated by differential ultracentrifugation and their proteome and methylproteome were characterized by liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS). The functional analysis was performed using the Ingenuity Pathway Analysis software. The levels of liver methionine cycle metabolites were assessed by LC-MS/MS.

RESULTS

Both betaine and methionine levels were lower in HFD livers, whereas the ratio between S-adenosylmethionine and S-adenosylhomocysteine, which reflects the methylation capacity, was unchanged. The reduced number of MAMs in HFD livers was confirmed using MET and PLA. The MAM proteome analysis revealed that 163 proteins were differentially abundant (127 upregulated and 36 downregulated proteins). The functional analysis of these data showed a strong enrichment of proteins related to translation (eIF4A1, RL10A) and a decrease in proteins involved in cholesterol biosynthesis (LSS, CP51A) and xenobiotic metabolism (EST1). Interestingly, methionine cycle-related enzymes were localized to MAMs (BHMT1, MATα1, GNMT) but with a similar content. Finally, the MAM methylproteome was composed of 95 methylated proteins, including 8 proteins that were methylated either on a lysine or arginine residue with a Variable Importance in Projection (VIP) score > 1,5, which enabled identification of proteins potentially involved in the regulation of MAM integrity.

CONCLUSIONS

Alteration of methionine cycle and MAM disruption occurred concomitantly in MASL, potentially through altered methylation processes at the MAM interface. The dysregulation of key cellular pathways such as translation and cholesterol biosynthesis in hepatic MAMs reinforces the fact that MAMs are important regulatory hubs for hepatocyte function.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 51 - BASIC RESEARCH IN NUTRITION

OAP51_01

AKKERMANSIA MUCINIPHILA ALLEVIATES DIABETIC COGNITIVE IMPAIRMENT BY INHIBITING BRAIN NLRP3 INFLAMMASOME ACTIVATION AND HIPPOCAMPAL SYNAPTIC DEFECTS

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BACKGROUND AND OBJECTIVES

Diabetic cognitive impairment (DCI) is a chronic complication of diabetes. *Akkermansia muciniphila* (*A. muciniphila*) is a next-generation probiotic with significant development potential, shown to improve metabolic diseases, neurodegenerative disorders, and neuroinflammation. This study aims to explore the neuroprotective effects of *A. muciniphila* by inhibiting brain *NLRP3* inflammasome activation in DCI mice.

METHODS

A total of 36 healthy controls and 27 patients with DCI were enrolled to investigate the differences in the relative abundance of *A. muciniphila* in fecal samples. We established a DCI mouse model in male C57BL/6J and *NLRP3* knockout (*NLRP3*−/−) mice to investigate the effect of *A. muciniphila* intervention on neurobehavioral deficits and the underlying mechanisms.

RESULTS

The relative abundance of *A. muciniphila* was significantly reduced in patients with DCI compared to healthy controls. Supplementation with either live or pasteurized *A. muciniphila* (5×10^9 CFU/200 μL) in DCI mice improved learning and memory ability, neuroinflammation, neuronal damage, and synaptic ultrastructure. Mechanistically, either live or pasteurized *A. muciniphila* significantly reduced the ratio of *Firmicutes* to *Bacteroidetes*, the relative abundance of *Adlercreutzia* and *Desulfovibrio*, and increased the relative abundance of *A. muciniphila*, *Bifidobacterium*, *Prevotella*, and *Paraprevotella*. Further studies have shown that either live or pasteurized *A. muciniphila* significantly inhibited the activation of the *NLRP3* inflammasome in the hippocampus. *NLRP3*−/− mice showed no significant improvement in learning and memory ability, neuronal damage, and synaptic ultrastructure by live *A. muciniphila* intervention, and could not significantly inhibit the activation of the *NLRP3* inflammasome in the hippocampus.

CONCLUSIONS

Collectively, our study found that *A. muciniphila* can alleviate DCI by inhibiting brain *NLRP3* inflammasome activation and hippocampal synaptic defects, which may be one of the underlying mechanisms of neuroprotection.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP51_02

DIET-INDUCED METABOLOMIC AND METAGENOMIC CHANGES IN THE SMALL INTESTINE: INSIGHTS FROM A PIG MODEL

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BACKGROUND AND OBJECTIVES

The intestinal microbiota is recognized as a key player in developing and maintaining obesity (1). While the small intestine is a critical site for nutrient sensing and absorption, its specific alterations in obesity have been underexplored. The small intestine microbiota can significantly influence its functions, and its alteration is observed in people suffering from obesity (2). However, it remains unclear whether obesity leads to changes in the microbiota, or whether the microbiota can be modulated by dietary modifications, leading to metabolic changes (3). Studies on these issues are mainly based on mouse models. We therefore sought to investigate the role of diet in metabolomic and metagenomic changes along the digestive tract using a non-coprophagic model, pig.

METHODS

Our study involved 40 Iberian pigs, fed either a control diet or a medium fat diet (MFD), not obesogenic. After 12 weeks, the pigs were sacrificed, and bile and duodenojejunal fluid metabolomic analyses were conducted. Illumina sequencing was performed on luminal content from three segments of the small intestine and two of the large intestine. The Metaphlan4 pipeline was used to profile microbial communities. Multivariate and multidimensional models were performed to identify significant differences between diets and correlations between morphometric, biological, and “omics” data.

RESULTS

Our RESULTS reveal sex-dependent diet-induced shifts in bile and duodenojejunal fluid metabolite levels. These metabolites include p-cresol, stachydrine, or indole derivatives. These metabolic changes were associated with changes in the gut microbiota. While α-diversity (microbial diversity within groups) remained similar across the dietary groups, β-diversity (differences between groups) showed significant variation ($p \leq 0.001$). In particular, we observed a decrease in *Lactobacillus johnsonii* and an increase in *Streptococcus alactolyticus* in the 5 segments studied in pigs fed the MFD.

CONCLUSIONS

These findings underscore the interplay between dietary fat, sex-specific metabolomic responses, and intestinal microbiota composition. Diet is a key driver of metabolic and genomic changes in the gut and bile, and influences key bacterial species, highlighting the need for further analyses to explore the potential mediating role of diet in shaping male and female pig phenotypes through bile and metagenomic changes. These findings offer promising insights into the role of nutrition in metabolic disease development.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP51_03

IMBALANCED VITAMIN B6 INTAKE SUPPRESSES MUSCLE HYPERTROPHY

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BACKGROUND AND OBJECTIVES

Sarcopenia is an age-related decline in skeletal muscle mass and function. Currently, no medical treatments exist for sarcopenia, with management strategies limited to nutritional and exercise interventions. Maintaining muscle mass is crucial for preventing sarcopenia, making muscle hypertrophy a key strategy. Human studies in Europe and Japan have shown an association between low vitamin B6 (B6) status and sarcopenia. Recently, we found that B6 deficiency impairs satellite cell (SC) activity and muscle regeneration. In this study, we investigated impact of B6 status on muscle hypertrophy.

METHODS

Eight-week-old male ICR mice were fed a basal diet with 1 mg (deficient), 7 mg (recommended), or 35 mg (supplemented) pyridoxine HCl per kg of diet for 8 weeks. The left tibialis anterior (TA) muscles were injured via cardiotoxin (CTX, 10 μM) injections, followed by a 28-day recovery for muscle regeneration and growth. This injury-recovery cycle was repeated to induce muscle hypertrophy. TA muscles were then isolated, weighed, and preserved for cryosections, while gastrocnemius (GAS) muscles were used for RNA extraction. Hematoxylin and eosin staining and immunofluorescence analysis assessed muscle morphology, myofiber types, and SC numbers.

RESULTS

All B6 diets had no effects on resting (uninjured) muscles. In regenerating (CTX-injured) muscles, muscle hypertrophy was significantly induced, as evidenced by a 1.4-fold increase in muscle mass; however, no significant differences were observed across all B6 groups. As compared to the 7 mg group, the 1 and 35 mg groups significantly decreased regenerating myofiber size. Additionally, the 1 and 35 mg groups significantly increased the number of small myofibers (< 1000 μm², $p < 0.01$) and decreased the number of large myofibers (> 4001 μm², $p < 0.05$). The 1 and 35 mg groups decreased type IIb myofiber percentage and increased type IIx myofiber percentage. The significant lower number of SCs was observed in the 1 mg and 35 mg groups. A significant upregulation of Atrogin1, a muscle atrophy-related gene, was observed in the 1 mg group.

CONCLUSIONS

This study suggests that both B6 deficiency and supplementation suppress muscle hypertrophy and reduce fast-twitch myofibers, possibly partly due to decreased SCs and Atrogin1 upregulation. An optimal intake of B6 is crucial for promoting muscle hypertrophy. Further work is needed to clarify the underlying mechanisms.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP51_04

CERAMIDE-ENRICHED CHYLOMICRONS DERIVED FROM THE ABSORPTION OF MILK SPHINGOMYELIN INHIBIT PLATELET AGGREGATION

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BACKGROUND AND OBJECTIVES

Dietary milk sphingomyelin (SM) showed beneficial effects on cardiometabolic health in women by decreasing serum triglycerides and some deleterious ceramide (Cer) species in intestine-derived chylomicrons. The intestinal absorption of SM implies its hydrolysis into Cer, and further into sphingosine (SPH) and fatty acids (FA), varying in chain length and degree of saturation. There is clear evidence that the digestion and the biological activities of sphingolipids depend on their acyl chains. Our objective was to study the metabolism of digestion products of SM in enterocytes and subsequently to determine the impact of secreted chylomicrons on platelet aggregation.

METHODS

Caco-2/TC7 cells cultured on permeable inserts served as a model to assess the intestinal uptake and trafficking of hydrolyzed products of SM. Mixed micelles containing different lipids and taurocholate were prepared without or with deuterated SPH (SPH-d9) and/or different FA, and applied twice to the apical side of cells. Targeted analyses of sphingolipids were performed by tandem mass spectrometry. The effects of chylomicrons, isolated from the basolateral media of cells, on the aggregation of platelets from human volunteers were investigated.

RESULTS

The enrichment of mixed lipid micelles with SPH-d9 and C23:0, one of the most abundant FA in milk SM, and their apical supply to Caco-2/TC7 cells led to increased SPH-d9, sphingosine-1-phosphate-d9 and Cer-d9 concentrations in cells, and to preferential synthesis of C23:0 Cer-d9 and its secretion in basolateral media. Resulting chylomicrons decreased collagen-induced aggregation of isolated platelets. Chylomicrons secreted from cells incubated with micelles enriched with SPH-d9 and C22:0, another abundant milk SM FA, also displayed anti-aggregant effects on platelets while those secreted from cells loaded with (SPH-d9+C16:0)-enriched micelles did not.

CONCLUSIONS

Our data indicate that micelles enriched with SPH and milk specific FA, mimicking postprandial micelles formed after milk SM ingestion, impacted enterocyte sphingolipid metabolism and Cer composition of chylomicrons, which inhibited platelet aggregation and may favorably influence metabolic health.

CONFLICTS OF INTERESTS

Catherine Calzada,the presenting author, has no conflict of interest to declare. Marie-Caroline Michalski received research funding from CNIEL, Sodiaal Candia R&I, and Danone Nutricia Research that are not related to the present in vitro study. Other authors have no conflict of interest.

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OAP51_05

TRANSCRIPTOMIC CHANGES IN RESPONSE TO ZINC DEPLETION AND SUPPLEMENTATION IN SMALL INTESTINE USING NEXT GENERATION SEQUENCING TOOL

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BACKGROUND AND OBJECTIVES

Small intestine is the major site of zinc absorption and possibly serves as a gateway to the exchangeable zinc pool. In this study, an understanding of the global changes in the gene expression in response to zinc deficiency and supplementation is attempted. Therefore, using next generation sequencing (NGS) based deep sequencing was employed to capture the global changes in the transcriptome and its impact on various physiological process was analysed using enrichment of differentially regulated genes (DEGs) under zinc deficient and supplemented conditions in the small intestine of rats.

METHODS

Total RNA sequencing was performed using the IonProton, a semiconductor based Next Generation Sequencing system (ThermoFisher). The Next Generation Sequencing platform is mainly involved with three main steps: a) preparation of RNA libraries b) template preparation and c) sequencing. Finally, the binary alignment map (.bam) files were collected from the machine for each sample and analysed.

RESULTS

The binary alignment map (BAM) reads generated in the NGS machine for the corresponding transcriptomes of the rat small intestine (Control, Zinc deficient and Zinc supplemented). The Gene ontology (GO) analyses of the differentially expressed genes were carried out to understand the impact of zinc deficiency on the biological processes. It was found that under zinc deficient conditions, majority of biological processed related to the immune system functions are modulated, whereas upon supplementation of dietary zinc modulated tweleve biochemical pathways. In addition using PathView, association of enriched DEGs with KEGG pathway was visualized and representative associations of down regulated DEGs with chemokine signaling, osteoclast differentiation and NF-kB signaling pathways were obsereved. Link to data:http://surl.li/jhvwqd

CONCLUSIONS

Transcriptome analysis,revealed a snapshot of several genes that are modulated in the small intestine during zinc deficiency and sufficiency condition. Expression of several genes were found to be significantly modulated under these conditions which covered wide array of functions from immune signaling to amino acid metabolism. Further analysis of other tissues important for zinc homeostasis is likely to give deeper insights into the molecular events responsible for tight regulation of zinc homeostasis and how the tissues respond differentially to different zinc status. The findings may augment the current understanding of PCR-based biomarker for zinc.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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AN INDIVIDUAL-SPECIFIC APPROACH TO MULTIDIMENSIONAL NUTRITION POVERTY IN INDIA: EVIDENCE FROM LARGE SAMPLE SURVEYS

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BACKGROUND AND OBJECTIVES

Globally, India records the highest rate of child wasting (18.7%) and stunting (35.5%) for 2018-2022. Despite efforts, progress in improving nutrition remains limited, and chronic malnutrition continues to pose a severe challenge to policymakers. In accordance with SDGs of health, the study aims to (1) develop a novel individual Multidimensional Nutrition Poverty Index (MNPI) for children under five in India, (2)compare the extent and factors of MNPI in states of India over the years and (3) assess and compare the area-wise share of MNPI.

METHODS

Using two rounds of the National Family Health Survey (NFHS 4 2014–15 and NFHS 5 2019–21), Alkire-Foster's methodology was applied to estimate the MNPI among children aged 0–59 months across the states of India. For the study, eight indicators were selected under four dimensions, viz., (1) stress: stunting and wasting, (2) access: maternal education and living standards, (3) availability: diet diversity and antenatal care, and (4) adequacy: immunization and maternal health. First-order stochastic dominance is used to check on the robustness of poverty cut-off and Spearman Rank correlation for weights of indicators.

RESULTS

The MNPI estimation shows a decline in multidimensional nutrition poverty between NFHS-4 (R1) and NFHS-5 (R2). The Headcount Ratio (H) decreased from 0.76 to 0.68, the Intensity of Poverty (A) from 0.56 to 0.52, and the MNPI from 0.43 to 0.35, reflecting overall nutrition poverty reduction. It is observed that the deprivation rates vary widely across states and indicators. At the national, state and regional levels, in both rounds, poor children are more deprived in the dimensions of minimum diet, standard of living, antenatal care and immunization with varying magnitude and order. However, the standard of living marked a 14% reduction in deprivation as against a 9% reduction in minimum diet over two rounds. By decomposing the country's MNPI for both rounds, Bihar (R1:0.57, R2:0.51) and Jharkhand (R1:0.55, R2:0.46) emerged as the states with the highest MNPI for R1 and R2. Though the overall share of state MNPI has declined over the years, states like Nagaland (R1:0.457, R2:0.461) and Kerala (R1:0.096, R2:0.139) have witnessed an increase in nutrition poverty compared to previous years. A comparison between rural and urban India showed that the MNPI was higher in rural regions (R1: 0.47, R2: 0.38).

CONCLUSIONS

This study provides insightful data for policymakers to prioritize nutrition-poverty states to ensure improvements in the overall MNPI. Another significant intervention is the identification of specific indicators that majorly impact the MNPI.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP51_07

S-ADENOSYLHOMOCYSTEINE HYDROLASE DEFICIENCY DECREASES STABILITY OF ATHEROSCLEROTIC PLAQUE AND INDUCES VSMCS PHENOTYPE SWITCHING VIA EPIGENETIC UPREGULATION OF KLF4 AND OCT4

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BACKGROUND AND OBJECTIVES

S-adenosylhomocysteine (SAH) is a novel risk factor of cardiovascular disease. SAH hydrolase (SAHH) inhibition leads to SAH accumulation and promotes the formation and development of atherosclerosis. However, the role and underlying mechanism of SAHH in stability of advanced atherosclerotic plaque is still unknown.

METHODS

Apolipoprotein E-deficient mice with heterozygous SAHH knockout or vascular smooth muscle cells (VSMCs)-specific or macrophage-specific SAHH knockout were used to investigate the effect of SAHH deficiency on atherosclerotic plaques stability. Murine and human aortic VSMCs were cultured to explore the potential mechanism of SAHH deficiency in phenotype switching of VSMCs. The relationship of SAHH with atherosclerotic plaque stability was evaluated in patients with coronary artery disease or ischemic stroke.

RESULTS

Heterozygote or VSMCs-specific but not macrophage-specific knockout of SAHH induced VSMCs phenotype switching and decreased plaque stability. Mechanistically, on one hand, SAHH deficiency resulted in SAH accumulation and induced KLF4 upregulation by inhibiting DNMT3b and leading to hypomethylation of KLF4 promoter. On the other hand, SAHH deletion led to adenosine deficiency and inhibition of AMPK, which resulted in downregulation of Sirtuin1(Sirt1)-mediated deacetylation and tetmethylcytosine dioxygenase (TET)2-mediated hydroxymethylation of KLF4 promoter in SAHH-deficient VSMCs. Furthermore, SAHH deletion reactivated OCT4-mediated VSMCs migration in KLF4-dependent manner via TET1-mediated hydroxymethylation of OCT4 promoter. Finally, decreased SAHH activity and elevated SAH levels were associated with unstable atherosclerotic plaque in patients with coronary artery disease or ischemic stroke.

CONCLUSIONS

These RESULTS suggest that SAHH deficiency decreased stability of atherosclerotic plaques and induced VSMCs phenotype switching via epigenetic upregulation of KLF4 and OCT4.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP51_08

ASSESSMENT OF PHYTOCHEMICAL PROFILE AND THERAPEUTIC POTENTIAL OF BAMBOO SHOOT FORTIFIED COOKIES AGAINST DIABETES

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BACKGROUND AND OBJECTIVES

It was an endeavor to make use of cheaper sources through high nutritional contour for the production of best quality baked products. The present exploration focused bamboo shoots' powder as an excellent supplemented flour for cookie production. Owing to nutritional composition and readily availability it is established that bamboo shoots can be incorporated in cookies to increase their meticulousness in nutrition conscious consumers.

METHODS

The research included phytochemical composition, therapeutic potential in organ protection, and enhancement in nutritional profile in cookies. This experiment delves into the phytochemical profile of bamboo shoots aiming to identify health- promoting compounds.

RESULTS

Proximate composition revealed that the powder of bamboo shoots contained elevated amount of fiber (24.44%) and protein contents (19.32%) while the lowest amount of fats (1.46%). Similarly means values for T10 was found to contain 14.10% protein and 2.48% fiber followed by mean values for T8 with 13.97% protein and 1.97% fiber, while means for fat percentage were non-significantly different among all treatments. The findings underscored the multifaceted therapeutic potential of bamboo shoots, contributing to the understanding of plant-based interventions in health.

CONCLUSIONS

Organoleptic and physicochemical analysis of fortified wheat flour with bamboo shoot powder revealed that this innovative product can bring a change in the production of functional foods with enhanced accuracy. The current research on this extraordinary material is very fascinating leading to emergence of new avenues of bamboo utilization including baking industry with nutraceutical potential.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP 60 - BASIC RESEARCH IN NUTRITION

OAP60_02

EXPLORING THE IMPACT OF SOCIAL MEDIA ON DIETARY HABITS: AN INTEGRATED BEHAVIOR MODEL APPROACH AMONG SAUDI COLLEGE STUDENTS

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BACKGROUND AND OBJECTIVES

Health behaviors play a crucial role in overall well-being, and in the digital era, social media has become a major influence on everyday life (1). While nutrition is a popular subject on social media, it is often accompanied by misinformation due to limited professional oversight (2). College students are among the most active users of social media, but its effects on their dietary habits remain underexplored. This study aims to assess the relationship between social media usage and the dietary habits of college students in Riyadh, Saudi Arabia using the Integrated Behavior Model (IBM). This model helps in understanding and predicting health-related behaviors, with a focus on intention and motivation (3).

METHODS

A cross-sectional study was conducted in Riyadh, Saudi Arabia using an online questionnaire among college students aged between 18-25 years. The questionnaire consists of two sections on demographics, and the influence of social media usage on dietary habits using the IBM constructs (attitude, subjective norms, knowledge, skills, perceived agency, intention, and salience). Its validity and reliability were tested, and structural equation modeling assessed the associations between the constructs.

RESULTS

The 38-item scale, tested for reliability among 401 participants (74.6% female), showed a Cronbach's α of 0.953–0.956. Females scored significantly higher than males on attitude (16.72±5.1 vs. 15.11±5.8), personal agency (15.82±5.4 vs. 14.43±5.5), intention (17.53±5.8 vs. 15.43±5.9), skills (5.04±2.6 vs. 4.41±2.5), knowledge (6.27±2.0 vs. 5.17±2.6), and salience (14.59±4.5 vs 13.01±4.6). Using the IBM model, social media's impact on dietary habits was analyzed across seven domains. Salience, personal agency, perceived norms, and skills significantly predicted intention, which indirectly influenced dietary habits through attitude ($p<0.0001$). Attitude mediated 74% of the total effect of intention on dietary habits, while the direct effect of intention was insignificant.

CONCLUSIONS

Using IBM was beneficial for understanding and predicting social media use in dietary practices. It provides a framework to identify the determinants of the behavior. This study could help create foundational work to establish targets for future public health interventions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP60_03

XYLOOLIGOSACCHARIDE AND AKKERMANSIA MUCINIPHILA SYNERGISTICALLY AMELIORATE INSULIN RESISTANCE BY RESHAPING GUT MICROBIOTA, IMPROVING INTESTINAL BARRIER AND REDUCING INFLAMMATION IN GESTATIONAL DIABETES MELLITUS MICE

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BACKGROUND AND OBJECTIVES

This study aimed to investigate the synergistic effects and mechanism of xylooligosaccharides (XOS) and *Akkermansia muciniphila* (*Akk*) on insulin resistance (IR) in gestational diabetes mellitus (GDM)/pseudo-germ-free (PGF) mice.

METHODS

Female mice were fed with AIN-93 (n=19) and high fat diet (HFD) (n=206). After 4 weeks, HFD-fed mice were further allotted to HFD, GDM, GDM+XOS, GDM+*Akk*, GDM+XOS+*Akk*, GDM+PGF, GDM+PGF+XOS, GDM+PGF+*Akk*, and GDM+PGF+XOS+*Akk* groups (n≥19). GDM was induced by intraperitoneally injecting streptozotocin and PGF was established by intragastrically administrating antibiotic cocktails. XOS (500 mg/kg·BW) or/and *Akk* (4×10⊥8 CFU) were gavaged once a day for 10 days. Fasting blood glucose (FBG), insulin and oral glucose tolerance test (OGTT) were determined. Gut microbiota were detected by 16S rRNA sequencing and absolute quantities of *Akk* by qRT-PCR. Intestinal tissues were stained by Hematoxylin-Eosin and Periodic acid-Schiff-Alcian blue staining. Occludin and Zonula occludens-1 (ZO-1) in intestine, and Akt, IRS-1, NF-κB p65 and TLR4 in liver and muscle were detected by Western blotting. The levels of LPS, TNF-a, IL-6 in serum were determined by ELISA kits.

RESULTS

In GDM mice, XOS, *Akk* and XOS+*Akk* reduced (p<0.05) the area under the curve of OGTT ,insulin and HOMA-IR and increased (p<0.05) Akt phosphorylation in liver and IRS-1 phosphorylation in muscle. Furthermore, XOS+*Akk* reduced (p<0.05) FBG and increased (p<0.05) Akt phosphorylation in muscle and IRS-1 phosphorylation in liver. XOS, *Akk* and XOS+*Akk* reshaped gut microbiota with XOS+*Akk* exhibiting the greatest effectiveness. XOS increased (p<0.05) *Akk* and clearance of gut microbiota abolished such effect. XOS, *Akk* and XOS+*Akk* reduced (p<0.05) the small intestine Chiu's score and the colon Dieleman's scores, increased (p<0.05) ZO-1 and Occludin, and decreased (p<0.05) TNF-α, IL-6 and LPS in serum and NF-κB p65 phosphorylation and TLR4 in liver and muscle.

CONCLUSIONS

XOS and *Akk* synergistically ameliorate IR by reshaping gut microbiota, improving intestinal barrier and reducing inflammation in GDM mice.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP60_04

ASSESSING DIGESTIBLE INDISPENSABLE AMINO ACID SCORE (DIAAS) AND NUTRITIONAL QUALITY OF NOVEL PLANT CELL CULTURES AND OAT PROTEIN PRODUCED VIA DRY EXTRUSION

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BACKGROUND AND OBJECTIVES

Plant cell culture (PCC) technology is gaining attention as a promising and sustainable approach to future food production, driven by the need to reduce environmental impact and enhance productivity. In line with the FAO recommendations (1), assessing protein quality and amino acid digestibility is essential for validating their potential as high-quality food sources. This study evaluated the Digestible Indispensable Amino Acid Score (DIAAS) of two novel plant cell lines: scurvy grass (Cochlearia danica) and rowan (Sorbus aucuparia) in vivo and in vitro. Oat protein (Avena sativa) fractionated via dry extrusion was also evaluated to compare the cell lines with a plant protein. Additionally, the nutritional composition was analysed.

METHODS

Forty-eight 7-week-old Sprague-Dawley male rats were fed for 9 days with a morning meal with 4 grams of either scurvy grass, rowan or oat based-diets for the intervention groups (n=8/group) and with no-protein, soy and casein for the control groups (n=8/group). On day 10, the rats were sacrificed 3.5 hours after received the morning meal, and the ileal lumen content was collected. The nutritional composition, including proteins and amino acids (AA) was determined and the true ileal digestibility values % (TID) and DIAAS score were calculated. The protein digestibility in vitro was assessed with INFOGEST digestion protocol combined with DIAAS calculation.

RESULTS

Rowan contained 27% total fibers, followed by scurvy grass (21%) and oat (14%). Scurvy grass had 132 mg/100g of vitamin C, while rowan had 126 mg/100g. Rowan also contained 16.8 µg/100g of vitamin D3. TID calculated in in vivo study of essential AA lysine in oat (143%) was significantly higher compared to scurvy grass (44%), latter being also significantly lower compared to soy (139%). Additionally, in scurvy grass, TID for methionine was found significantly lower (35%) compared to soy (265%). DIAAS scores for adult population was in oat 74%(for lysine), for scurvy grass 31% (for lysine) and rowan 59% (for threonine).

CONCLUSIONS

DIAAS score of novel PCCs (scurvy grass and rowan) and oat protein was assessed and together with previous unpublished RESULTS the consumption of these PCCs could be considered safe, non-toxic and able to provide essential AA required.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP60_05

FAS IN ADIPOSE TISSUE MODULATES GUT MICROBIOTA TO EXACERBATED DEXTRAN SODIUM SULFATE-INDUCED INFLAMMATORY BOWEL DISEASE IN OBESITY

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BACKGROUND AND OBJECTIVES

Inflammatory bowel disease (IBD) has emerged as a global health concern owing to rising incidence rates worldwide. Studies have shown that obesity is a risk factor for IBD development, although the underlying molecular mechanisms remain unclear. Fas (CD95), a member of the tumor necrosis factor (TNF) receptor superfamily, is upregulated in the adipose tissue of obese individuals and influences adipocytes through non-apoptotic pathways. However, the role of Fas signaling in adipose tissue during IBD has not been thoroughly investigated. Both obesity and IBD are characterized by gut homeostasis disruption, including alterations in the gut microbiota. This study aimed to determine whether Fas signaling in adipose tissue contributes to the progression of IBD during obesity and to explore the mechanisms involved in gut microbiota.

METHODS

Fas overexpression in male adipocyte (Fas CKI/CKI×Adi-cre) and littermate mice (Fas CKI/CKI) were used to establish a mouse model of IBD induced by dextran sodium sulfate (DSS) after a high-fat diet (HFD) for 7 weeks. Body weight and stool blood were monitored daily, and changes in serum, colon, and fecal samples were analyzed for inflammatory markers, histological alterations, and gut microbiota composition. Fecal microbiota transplantation (FMT) was conducted to investigate the role of gut microbiota in the susceptibility of Fas CKI/CKI×Adi-cre mice to colitis.

RESULTS

Compared with HFD-Fas CKI/CKI mice, HFD-Fas CKI/CKI×Adi-cre mice exhibited a significantly higher disease activity index, exacerbated weight loss, and more severe colonic damage post-DSS treatment, along with elevated serum IL-6 levels. Key microbial differences were identified, with dominant genera including *Roseburia* in FasCKI/CKI mice and *Escherichia-Shigella, Erysipelatoclostridium* in Fas CKI/CKI×Adi-cre mice. Additionally, FMT experiments indicated that mice receiving the gut microbiota from the Fas CKI/CKI×Adi-cre mice exhibited intensified DSS-induced IBD symptoms.

CONCLUSIONS

Our study showed that HFD-induced obesity promoted the progression of IBD by increasing Fas signaling in the adipose tissue, which modulated the alteration of the gut microbiota.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP60_06

PROTEIN FERMENTATION BIOMARKERS DO NOT VARY BETWEEN DIETARY PROTEIN SOURCES DIFFERING IN DIGESTIBILITY

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BACKGROUND AND OBJECTIVES

Microbial fermentation of undigested proteins in the large intestine may result in the production of metabolites that are potentially harmful to gut epithelia and host health. Whereas an increase in protein intake is known to increase the flow of proteins into the large intestine, and in turn, protein fermentation, the effect of protein digestibility on this process is unknown. To investigate this, a fully controlled randomized cross-over human dietary intervention study with 2 protein sources that differed in digestibility was performed in 15 participants, after which protein biomarkers were measured.

METHODS

Participants were provided for 7 days with a diet supplemented with 30 grams of protein per day (divided over 3 meals) either from Bovine Plasma Protein, as low digestible protein (LDP), or Whey Protein Isolate, as high digestible protein (HDP) source. The proteins, lipids, carbohydrates, and fiber contents were the same for both diets and corresponded to 12%, 36%, 50%, and 2% (w/w) of total energy intake. Acid-insoluble-ash (AIA) was added to the diet as indigestible marker to quantify fecal biomarkers. There was a 7-day washout period between dietary interventions.

RESULTS

It was found that, fecal ammonia concentrations were not different between diets (mean ± SD: LDP 16 ± 6 vs HDP 17 ± 5 mg/g AIA, $p=0.743$). Also, no statistical differences between diets were observed for fecal SCFA (LDP 1807 ± 1085 vs HDP 1987 ± 1575 µmol/g AIA) and BCFA (LDP 134 ± 52 vs HDP 139 ± 43 µmol/g AIA) concentrations ($p>0.05$), and urea in urine (LDP 19 ± 5 vs HDP 22 ± 3 mmol/mmol creatinine, $p=0.595$).

CONCLUSIONS

In conclusion, protein fermentation biomarkers measured in feces and urine were not increased when participants were supplied a LDP source compared to a HDP source. Individual variation in fecal biomarkers between participants was high, suggesting that individual differences play a large role in metabolite kinetics in the gastrointestinal tract.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP60_07

PROXIMATE ANALYSIS AND MINERAL CONTENTS OF LOCALLY MADE MULTIGRAIN POWDER (SABAYA) IN NORTHERN NIGERIA

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BACKGROUND AND OBJECTIVES

In Northern Nigeria, there is a growing trend among women to prefer a chubby physique over a slim one. To achieve this, women consume locally made multigrain powder (Sabaya) as a supplement for weight gain, particularly during weaning or after experiencing weight loss. Despite its popularity, there is a scarcity of research on the composition and nutritional content of this powder. This study aims to investigate the nutritional contents of locally made multigrain (Sabaya) powder obtained from different vendors.

METHODS

The moisture, crude protein, crude fat, total ash, crude fibre contents of different Sabaya powders were determined using the established procedures of AOAC. The mineral contents of the powders were also determined according to the procedures of AOAC. Data obtained were subjected to one way analysis of variance (ANOVA) using SPSS V24.0.

RESULTS

Significant differences were observed in the proximate composition of various powders. Carbohydrates contents of the powders varied significantly ($P<0.05$) between sample A, B and C. Sample A contains high level of protein (26.05%) when compared with that of B (21.23%) and C (19.60%) with also significant increase in ash content. The order of the mineral elements in the powders was K>Ca>Fe>Na>Mg>Zn>Cu, sample B consist of high amount of K (2138 mg/L) and Mg (2.373 mg/L) when compared with A and C. Sample C contains low Ca (15.65 mg/L), Cu (0.200 mg/L), K (1412 mg/L) and Zn (1.619 mg/L) but with increase in the level of Na (7.295 mg/L).

CONCLUSIONS

The present study has shown that locally made multrgrain (Sabaya) contains high protein, fat and carbohydrate which are nutrients needed by the body. The ash contents suggest that they are good sources of minerals.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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OAP60_08

SOURCES OF DIETARY MICRONUTRIENT INTAKE AMONG U.S. YOUTHS AGED 2–19 YEARS, NHANES 2021–2023

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BACKGROUND AND OBJECTIVES

Information on the dietary sources of essential micronutrients (MN) can help guide public health strategies to address deficiencies. This study aimed to identify and quantify the primary dietary sources contributing to the intake of nutrients of concern—iron, potassium, calcium, Vitamin D (VD)—among U.S. youths aged 2–19 years.

METHODS

Descriptive analysis of dietary intakes among US youths aged 2–19 years in the most recent NHANES cycle, 2021-2023 were conducted using the Day 1 dietary recall data (n=3756). Dietary supplements were not included in this analysis as the supplement data from this cycle has not yet been published. Micronutrient contributions were summarized by What We Eat in America (WWEIA) food classification categories and subcategories, overall and stratified by age group (2-5, 6-11, or 12-19 years).

RESULTS

Iron intake was highest from Grains (32%, including 19% from the Ready to Eat (RTE) Cereals subcategory), and Mixed Dishes (30%, including 12% from Sandwiches and 7% from Pizza). Top sources were similar by age group. Potassium intake had significant contributions from Mixed Dishes (20%, including 11% from Sandwiches), and Milk and Dairy (17%), primarily from Milk alone (8%). Other contributors to potassium intake were Protein foods (12%), Grains (11%), and Snacks and Sweets (10%). Fruits contributed 11% of potassium at 2-5y, 8% at 6-11y and 6% at 12-19y. For calcium intake, Milk and Dairy contributed 36% overall, with Milk alone accounting for 19%. Additional contributors to calcium intake were Mixed Dishes (26%, including 12% from Sandwiches and 7% from Pizza), Grains (11%), Snacks and Sweets (8%), and Water (7%). Half (51%) of VD intake was from Milk and Dairy, with Milk contributing 32%. Protein Foods contributed 15% of VD intake, Grains 14% (including 13% from RTE Cereals), and Mixed Dishes 12%. Milk provided relatively more calcium and VD to children 2-5 years (40% and 29%, respectively) compared to older children (~30% and 15-18%).

CONCLUSIONS

This study highlights the primary dietary sources of calcium, potassium, VD, and iron among U.S. youths, suggesting important roles for dairy and fortified foods (e.g. RTE cereal). Mixed dish disaggregation and supplement analysis will provide further insight. Some sources differed by age, especially for children 2-5y. Efforts to address inadequacy of nutrients of concern should prioritize food groups that align with overall diet quality.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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OAP60_09

APPLICATION OF THE COM-B MODEL TO INFORM DIET BEHAVIOUR CHANGE INTERVENTIONS IN PASTORALISTS SETTING IN KENYA

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BACKGROUND AND OBJECTIVES

There is limited evidence for successful interventions to improve consumption of healthy diets among pastoralists in Africa who are most affected by malnutrition. Designing effective interventions requires characterisation of barriers and enablers underlying healthy diet consumption. We used the Capability-Opportunity-Motivation- Behaviour (COM-B) Model to identify these for diet behavor change intervention planning in pastoralist setting.

METHODS

A cross-sectional study was used to collect data on diet behaviour of pastoralist Women of Reproductive Age (WRA). Survey tools comprised of a questionnaire developed based on COM-B and administered through ODK- and a 24-hour diet recall in CATCH-24 App. Confirmatory Factor Analysis measured models and Structural Equation Modelling tested the models.

RESULTS

A total of 349 WRA were sampled with a mean age of 34 years, household sze of 6 persons, predominantly male headed (85%), severely food insecure (70%), illiterate (50%), and Muslim (99%). The COM-B model explained 38% of the variance in diet quality. Diet quality was positively associated with motivation (Beta=0.69; $p<0.001$) as measured through convenience and food price; opportunity (Beta=0.68; $p<0.001$) measured through availability of healthy foods and media exposure to unhealthy foods; capability (Beta=0.74; $p<0.001$) measured through well-being. However, capability measured through habit and nutrition knowledge was negatively associated with capability.

CONCLUSIONS

The COM-B model identified barriers: habit and nutrition and, enablers: price, convenience, availability of healthy foods, media access to unhealthy food as underlying pastoralists' diet behaviour suggesting combination of of all the 3 COM-B constructs to effectively influence and accelerate behaviour change. Further research is needed to apply COM-B model in non-pastoralist settings, for a different age group.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

1. Theory of Reasoned action
2. COM-B Model

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The future of nutrition recommendations

SOAP 01 - THE FUTURE OF NUTRITION RECOMMENDATIONS

SOAP01_01

MODELING INCREASED DIETARY DIVERSITY IN PLANT AND ANIMAL PRODUCTS AND ITS IMPACT ON DIET QUALITY

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BACKGROUND AND OBJECTIVES

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Dietary diversity is an integral component of dietary guidelines that aim to improve nutritional quality and health. However, the associations between dietary diversity, diet quality and health are not well defined. Unspecific recommendations for dietary diversity may lead to unintended negative health effects, depending on the food groups where diversity operates. In the context of the shift towards more plant-based diet, this study investigates the effect of increasing dietary diversity within animal and plant food groups on diet quality.

METHODS

We developed a model to simulate individual-specific increases in dietary diversity within one or more food groups, based on observed adult diets from the latest French Individual and National Food Consumption (INCA3) Survey. Diet quality of modeled diets for each individual was assessed using scores for nutrient adequacy, nutrient security (risk of overt deficiency), moderation (avoiding excessive intake of sugar, sodium, and saturated fat), using probabilistic assessment, and the risk of chronic diseases, using comparative risk assessment. In this study, dietary diversity was increased within plant products, animal products, fatty/sweet/salty products, or in all food groups.

RESULTS

Increasing dietary diversity in plant products or animal products similarly improved nutrient adequacy (by +12±1% and +15±1%, respectively) and nutrient security (+3±1% and +4±1%, respectively). The score reflecting the risk of chronic diseases also improved for all types of products, indicating a reduced risk, with the greatest benefit observed for increased diversity in plant products. However, moderation was negatively affected when diversity was increased in animal products (-8±1.0%) but remained stable for plant products. By comparison, increasing diversity within fatty/sweet/salty products had only minor effects on diet quality, and increasing diversity in all groups had varied effects on nutrition and health assessment.

CONCLUSIONS

Dietary diversity can improve some aspects of dietary quality, but can compromise moderation when applied to animal products. Improving diversity in plant products is more beneficial to diet quality, especially with respect to long-term health.

CONFLICTS OF INTERESTS

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SOAP01_02

GENERATING EVIDENCE IN MODERATE WASTING (GEM)

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BACKGROUND AND OBJECTIVES

In Nepal, 25% of children under five are stunted, 8% are wasted, and 43% of children and 34% of women are anemic with high micronutrient deficiencies. Moderately Acute Malnourished (MAM) children face a 3–4 times higher mortality risk. Despite efforts through programs like IMAM, initiated in 2011, malnutrition rates remain high due to food insecurity, inadequate healthcare, and sociocultural barriers. The Moderate Wasting Initiative (MWI) enhances nutrition stakeholders' capacity to implement scalable solutions, including traditional and WHO-aligned approaches. By assessing regional nutrition determinants, MWI identifies gaps and opportunities to strengthen and adapt programs for children with moderate wasting.

METHODS

The MWI tools, developed by the Nutrition Determinants Working Group (NDWG) of the Global Nutrition Cluster (GNC) and led globally by ACF UK, were contextualized by ACF Nepal. Using the Rapid Nutrition Determinants Assessment methodology, the project was implemented in three municipalities. Data collection included 11 Key Informant Interviews (KIIs) and nine Focus Group Discussions (FGDs) to assess 20 nutrition determinants across five categories. Qualitative research developed Nutrition Determinant Pathways and Action Plans, supported by surveys, stakeholder workshops, and multi-sectoral analysis, culminating in comprehensive MAM intervention methodologies, training, implementation, and regular monitoring.

RESULTS

The analysis conducted in three municipalities of Nepal identified significant factors influencing undernutrition, with gender playing the most critical role. Women's heavy workload, inadequate diet quality, and limited access to income sources were consistently ranked as priority determinants. These findings led to the development of a nutrition determinants pathway aimed at addressing these challenges. A workshop involving municipal stakeholders was organized to present the pathway, discuss key insights, and identify strategies to improve nutrition outcomes within their respective communities.

CONCLUSIONS

The assessment methodology, piloted by Action Against Hunger Nepal, effectively improved assessment preparation, optimized team sizing, and contextualized tools. It enhanced local teams' capacity for qualitative assessments and provided actionable insights on nutrition determinants for program planning. Action Against Hunger intends to share the tools and methodology widely following the pilot's success.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP01_04

DEVELOPING INTERIM FOOD-BASED DIETARY GUIDELINES FOR THE GENERAL POPULATION IN CAMBODIA – HEALTHY, DIVERSE, SUSTAINABLE

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BACKGROUND AND OBJECTIVES

Despite economic growth high prevalence of malnutrition persists in Cambodia. Simultaneously, Cambodia is amid a nutrition transition, moving from a traditional diet rich in starch and fibre-based foods to one dominated by consuming fatty, animal-source foods, refined carbohydrates, and (ultra-) processed foods. The growing consumption of sugar-sweetened beverages and energy-dense snacks, high in sugar, fat, and salt, has become a major concern, particularly among young children. The increasing threats of Climate Change to Cambodia's food systems are further expected to exacerbate the prevalence of undernutrition, micronutrient deficiencies, and overnutrition. The main objective of the food-based dietary guidelines (FBDG) is to increase awareness and behavioural change among the Cambodian population, resulting in improved dietary patterns while promoting sustainable healthy diets concerning climate, cultural acceptance, food availability and affordability.

METHODS

The development of the FBDGs was initiated by the Ministry of Health in Cambodia to complement existing guidelines on dietary patterns. A mixed-METHODSapproach was used to develop the FBDG. First, an in-depth literature review of available scientific evidence was conducted. The pre-developed key recommendation was tested for wording and understanding during two focus group discussions (FGD) with 20 participants. Following the finalization of the key recommendations, social behaviour change materials were developed and tested using FDG (n= 10) within five provinces in Cambodia (Kampot, Kampong Thom, Takeo, Kratie and Phnom Penh) among the target group.

RESULTS

The guidelines target women of reproductive age (15-49 years), pregnant and lactating women, caretakers of infants 0-6 months and 2-6 years old, adults (18-59 years) and elderly (60+ years). Children aged 2-5 years and school-aged children 7-17-years were covered in other guidelines. Based on the literature review, a set of 14 key messages was developed for the general Cambodian population. The key messages cover exclusive breastfeeding, dietary diversity, reduction of rice, reduction of sugary, fatty and salty foods, physical activity, tobacco and alcohol, water intake, and handwash.

CONCLUSIONS

Cambodia has developed their first food-based dietary recommendations for the general public using a sustainable and human-centred approach, including the general public in understanding the recommendations and communication materials.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP01_06

ACTIVATOR: IS NUTRITION RESEARCH IN ASIA UP TO THE TASK?

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BACKGROUND AND OBJECTIVES

Asia is an emerging economic power housing >50% of the global population. The recent rapid economic development has fuelled nutrition transitions, leading to a triple burden of diseases- overnutrition, undernutrition and, micronutrient deficiencies. Asia's diverse food environment and differences in physiology and dietary response indicate that local empirical evidence is imperative to solve its unique and complex nutrition challenges. It is therefore important to evaluate and reflect on the current state of Asian evidence to make intelligent future investments. The ACTIVATOR aims to fulfil this urgent need by addressing four specific objectives: (i) Understand the current state of nutrition research in Asia, (ii) Identify successes and gaps within the region, (iii) Facilitate collective proposition of context-specific solutions to close gaps, and (iv) Build capacity for Asian nutrition research and advocacy.

METHODS

ACTIVATOR will take place in four phases: (i) Consortium building, (ii) Meta-research study for decadal evidence evaluation, and (iii) Dissemination and discussion with a broader group of intergenerational nutrition researchers through the involvement of Asian nutrition societies to identify facilitators and barriers to good research and outline a road map for capacity-building. Finally, (iv) Liaison with stakeholders will collate and publish the outcomes from Phases (i–iii) as a white paper for dissemination through webinars to reach all stakeholders: academia, professional bodies, industry, and policymakers.

RESULTS

The ACTIVATOR Consortium has been established with its Core Team including active and consenting researchers at different career stages from the ten Asian countries (Bangladesh, China, India, Indonesia, Malaysia, Nepal, Pakistan, Singapore, Sri Lanka, and Thailand) that account for >70% of the region's publication output**.** ACTIVATOR is supported by external observers and experts in meta-research, nutrition, and management of science-policy interface in Asian settings (Table 1). Towards addressing the project's first objective (i.e. to understand the current state of nutrition research in Asia), a meta-research protocol was registered and evaluation is ongoing. The RESULTS from this evaluation will be presented at IUNS-ICN.

CONCLUSIONS

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With the realization of all four objectives, ACTIVATOR will provide a road map for future nutrition research of, by, and for Asian stakeholders to solve the region's unique and pressing nutrition challenges.

CONFLICTS OF INTERESTS

SS has previously received consulting fees from Abbott Sdn. Bhd.Other authors declare no conflict of interestMA has previously received consulting fees for nutrition programmes/projects from Yakult Malaysia Sdn Bhd, Ajinomoto (M) Sdn Bhd and Herbalife.

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SOAP01_07

NEPAL'S SCHOOL FOOD ENVIRONMENT AND NUTRITION PRACTICES: ASSESSMENT OF FAT AND SODIUM IN SCHOOL CAFETERIAS IN URBAN MUNICIPALITIES

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BACKGROUND AND OBJECTIVES

In Nepal, NCDs account for over half of total mortality, and diet is a key modifiable risk factor. Nepal's multisectoral action plan for 2021-2025 aims to reduce NCD-related mortality by 25%. The World Health Organization (WHO) endorses public food procurement and service policies to reduce NCDs caused by unhealthy diets. A novel tool was used to assess school meal service in Nepal to evaluate changes before and after policy implementation.

METHODS

Trained data collectors visited all schools implementing procurement policy in three municipalities in 2024, and the *Healthy Food Procurement and Service Policy Evaluation Toolkit* was implemented. This novel tool was developed using the *Guide to developing nutrition standards for healthy public food procurement and service policies*. One-day structured observations were made of meals and snacks served, and foods and beverages in the pantry. On-site interviews were held with food procurers or preparers. School food environment data pertaining to fat and sodium were summarized using median and interquartile range (IRQ) for continuous variables and percentages and frequencies for categorical variables.

RESULTS

Among 249 schools, 202 (84%) were private, 30 (12%) were government, and 9 (4%) were community schools. Schools had a median of 305 (IQR 100-500) students enrolled. All schools had an onsite kitchen, and almost all (94%) served meals and snacks to children 6 days per week. Most schools (n=236; 94.8%) composed and served a fixed meal to children; 3 (1.2%) used standard recipes. Salt and condiments were available in the eating area of 1.2% and 4.8% of schools, respectively. Most schools (65%) reported deep frying foods; on the day of observation, 33% were observed doing so. Just under one-third (31%) reported always purchasing lean meats or trimming visible fat from meat. 17% of schools had at least one food that contained industrial trans fat in the pantry.

CONCLUSIONS

Baseline data collecting using the *Healthy Food Procurement and Service Policy Evaluation Toolkit* reveals strengths and areas for improvement in Nepal school food environments. Children currently have limited access to table salt and condiments. However, school procurement policies should mandate the use of standardized recipes with limited added salt, limit fried foods (served in most schools), provide training on purchasing and serving meat with less fat (currently practiced in one-third of schools), and eliminate foods that contain trans fats (currently present in about one out of every 6 schools).

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP01_08

CONSTRUCTION OF A DATABASE ON ILEAL DIGESTIBILITY OF PROTEIN AND AMINO ACIDS IN FOODS CONSUMED BY HUMANS- AN EXPERT CONSENSUS FRAMEWORK FOR THE EXTRACTION AND CURATION OF PUBLISHED DATA FROM IN-VIVO AND IN-VITRO EXPERIMENTS

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BACKGROUND AND OBJECTIVES

Protein quality assessment by amino acid digestibility scoring has been discussed in various Food and Agriculture Organisation (FAO) expert meetings. In 2014, the need for a robust database on the protein digestibility of foods consumed globally –particularly for low-income and middle-income countries – was first recognized. In 2022, the FAO and the International Atomic Energy Agency (IAEA) embarked on the creation of such a database.

METHODS

The 2022 Joint FAO/IAEA technical meeting outlined the database development framework based on oro-ileal digestibility data for both protein and individual amino acids obtained *in vivo* in humans, pigs and rats, in dissenting order. A systematic review of the literature was carried out from database inception (Scopus, Web of Science, PubMed Central) to end of November 2024. A technical advisory group led by FAO and IAEA was established in March 2024 to guide the database construction and a follow-up expert meeting was held in November 2024 to revisit the inclusion criteria and finalize the database architecture.

RESULTS

A total of 5,313 published articles were identified of which, 1,088 were eligible after title and abstract screening leading to a final ~550 full text articles included for data extraction. The database included food description (name, food group, botanical name, country of origin, seasonality, degree of processing etc.), protein and amino acid content (per 100g food and per g of protein), moisture content, protein and amino acid ileal digestibility followed by calculations of ileal Protein Digestibility Corrected Amino Acid Score (ileal-PDCAAS) and Digestible Indispensable Amino Acid Score (DIAAS) by age groups.A separate database was created to include data on the metabolic availability of amino acids in food, measured by the indicator amino acid oxidation (IAAO) method, considering that while these data are of interest, IAAO is not a direct measure of protein and amino acid ileal digestibility.

CONCLUSIONS

The scientific literature is sufficiently advanced to support the creation of a database on the ileal digestibility of protein and amino acids in foods consumed by humans. Values of oro-ileal digestibility are prioritized over faecal digestibility when discussing the digestibility of foods. Studies in animals should be validated against

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human data and standardised protocols should be used across the research design. Following the database publication, researchers and organizations should contribute to this highly relevant resource and utilize the practical guide as a source of inspiration and an educational tool.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP01_09

WHEN DOES DIETARY DIVERSITY ENHANCE DIET QUALITY? THE IMPORTANCE OF FOOD GROUPS AND DIMENSIONS

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BACKGROUND AND OBJECTIVES

To some extent, dietary diversity is essential for adequate nutrient intake. However, a higher diversity has also been associated with overconsumption and excessive intake of harmful nutrients. Therefore, the impact of diversity is likely to depend on the food groups in which it operates. It may also depend on the dimension of diversity, which can be of three types (the number of foods consumed, their uniformity, and their nutritional dissimilarity). The aim of this study was to evaluate how dietary diversity within different food groups affects diet quality by analyzing the effects of an increase according to three dimensions.

METHODS

Following a literature review, we defined dietary diversity according to three dimensions: count, evenness, and nutritional dissimilarity of the foods consumed. We developed a model to simulate individual-specific increases in diversity within one or more food groups, either in all dimensions simultaneously or one dimension at a time, and without changing the total amount of the food groups. Our study was based on observed adult diets from the latest French Individual and National Food Consumption (INCA3) Survey. The diet quality of diversified diets was assessed using scores for nutrient adequacy, nutrient security (risk of overt deficiency), and moderation (avoiding excessive intake of some nutrients). In the modeled diets, diversity was increased within 18 food groups according to each dimension.

RESULTS

The Vegetables group was the only group where increased diversity consistently improved or maintained diet quality scores across all dimensions, with changes ranging from 0% to +4.4% compared to the observed diets. Increased diversity was also beneficial within "Bread products" (-1.0% to +4.7%), driven by higher fiber and magnesium intake due to partially replacing refined bread with whole-grain bread, and within "Fish and seafood" (-0.3% to +5.2%), attributed to higher EPA+DHA intake from partially replacing lean fish and seafood with fatty fish. In contrast, increased diversity within "Dairy" had an overall negative effect, resulting in decreases in nutrient adequacy (-1.8% to 0.0%) and moderation (-3.1% to -0.1%) due to partially replacing milk with cheese and dairy desserts. For other food groups, the effects of increased diversity were mixed and depended on the dimension of diversity applied. For example, increasing nutritional dissimilarity within "Grains and potatoes" improved diet quality, whereas increasing evenness did not.

CONCLUSIONS

The effect of dietary diversity on diet quality is dependent on food groups and dimensions. Specifying subgroups to be recommended within food categories could improve diet quality.

CONFLICTS OF INTERESTS

AB’s PhD fellowship is currently being funded in part by a research contract with Ecotone Foundation, under the aegis of the Fondation de France. FM is the scientific leader under this contract.

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SOAP01_12

ADAPTING THE MEDITERRANEAN DIET FOR ASIANS: SENSORY EVALUATION IN NON-ALCOHOLIC FATTY LIVER DISEASE (NAFLD) PARTICIPANTS

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BACKGROUND AND OBJECTIVES

The Mediterranean Diet (MD) is associated with health benefits and sustainability. However, its acceptance and implementation in Asia face challenges due to local unfamiliarity. The aim of this study is to examine the acceptability of the Asian-adapted MD in NAFLD patients in Singapore.

METHODS

We developed 14 Asian dishes adhering to MD characteristics. Participants with primary NAFLD, aged 21-60 years, attended two sensory evaluation sessions, each featuring 7 dishes. Participants rated four sensory attributes (appearance, aroma, texture, saltiness) and overall taste and acceptability on a 7-point Likert scale, with a rating of 5 and above indicating good acceptability. Linear mixed models (LMM), adjusting for dish and subject identifiers, were used to assess the association between the sensory attributes and overall taste and acceptability.

RESULTS

Thirty subjects (19 males, 11 females; mean age 43.9 ± 12.1 years; mean BMI 29.7 kg/m² ± 5.3) completed both sessions. Of the 14 dishes, 12 (85.7%) achieved good overall mean score in appearance (5.29 ± 1.31), aroma (5.46 ± 1.19), texture (5.29 ± 1.33), overall taste (5.45 ± 1.37), and overall acceptability (5.45 ± 1.38). LMM analysis showed that texture is strongly associated with overall taste (βtaste = 0.83, Padj<0.001) and overall acceptability (βacceptability = 0.83, Padj <0.001). This is followed by saltiness, aroma, and appearance against both overall taste and acceptability (Padj <0.001) (Table 1).

Table 1. Associations between sensory attributes and overall taste and acceptability

Sensory Attribute	Overall Taste			Overall Acceptability		
	β	SE	Padj	β	SE	Padj
Appearance	0.557	0.045	<0.001	0.587	0.044	<0.001
Aroma	0.714	0.045	<0.001	0.742	0.044	<0.001
Texture	0.830	0.029	<0.001	0.833	0.030	<0.001
Saltiness	0.795	0.035	<0.001	0.787	0.036	<0.001

CONCLUSIONS

Our findings demonstrate high overall acceptability across various sensory attributes. Understanding the contribution of different sensory attributes to overall taste and acceptability can guide the future development of Asian-adapted MD recipes for broader adoption in Singapore.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP01_13

SOCIOECONOMIC INEQUALITIES IN DIET AND NUTRITION – A SYSTEMATIC REVIEW OF ASIA

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BACKGROUND AND OBJECTIVES

Chronic disease burden is disproportionately shouldered by the lowest socioeconomic strata1,2. Disease risk is predicted by reduced nutrition and diet quality, however, the socioeconomic disparities of Asian countries remain poorly described3. This systematic review aims to investigate the relationship between socioeconomic status (SES) and key parameters of nutritional quality (reported caloric, macronutrients and micronutrients intake, biomarkers of nutritional status) and diet (food groups and types, healthy diet indexes) in adults across Asian countries.

METHODS

Multiple online databases (Pubmed, CINAHL, Embase, Web of Science) were systematically reviewed (n = 4,990) following the PICOS framework. Shortlisted studies (n = 114) were summarised according to the reported correlations between socioeconomic status (defined by income, education level, residential status or relevant SES index) and nutrition/diet measures. Nutrition/diet disparities between the lowest and higher SES strata were also quantitively evaluated. Where relevant, subgroup analyses (e.g. by country's GDP per capita, pregnant women cohorts etc.) were conducted.

RESULTS

Studies were diverse (n = 10 countries such as India, southeast Asia etc., including 65 to 714,421 participants) with a majority that included generally healthy (~ 91 % of studies), cross-sectional cohorts (data reported 1998 to 2021). Collective data evaluation suggested poorer overall nutrition (according to diet quality and diversity indexes) among the lowest SES strata, attributed to challenges in meeting requirements of specific food groups (such as animal-protein foods (median: 30.2 % lower intake in lowest SES), and fruits (median: 33.3 % lower intake in lowest SES)), and the use of excessive table salt over alternative condiments (e.g. herbs and spices). Notably, risks of specific nutrient inadequacies (including dietary fiber, thiamine, riboflavin, folate, vitamin D and potassium) were identified (17.2 % to 91.9 % below WHO recommended daily values), putting the lowest SES strata at heightened risks of malnutrition-related health concerns. This largely aligned with biological nutrients status which highlighted vitamin D, iron and iodine deficiencies as key concerns.

CONCLUSIONS

This systematic review provided evidence-based findings on the most prevalent nutrient and diet constraints that are compromised in the lowest SES of Asia. Our findings will form the basis for key problem statements to address regional food and nutrition insecurities, which will be instrumental in shaping the future of nutrition recommendations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP01_14

PESCATARIAN DIET MAY OFFER GREATER BENEFITS FOR PRESERVING DNA INTEGRITY

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BACKGROUND AND OBJECTIVES

A balanced diet provides essential nutrients like carbohydrates, proteins, fats, vitamins, and minerals that are crucial for the body's proper functioning and overall health. Dietary choices have a profound impact on various aspects of physical and mental well-being, disease prevention, and quality of life. Increasing evidence suggests that nutrition can influence DNA stability by enhancing antioxidant defences and modulating the body's DNA repair capacity. In particular, plant-based diets and higher consumption of fish and seafood are linked to improved health, longevity, and well-being.

METHODS

In this study, we aimed to explore the effects of different dietary habits on primary DNA damage in healthy young women living in Zagreb, Croatia using the alkaline comet assay, a sensitive, rapid, and cost-effective technique for assessing DNA damage at the single-cell level. Selected participants were grouped into vegetarians and non-vegetarians, with the non-vegetarians further divided into omnivores and pescatarians.

RESULTS

Our findings revealed significantly ($p < 0.05$) higher DNA damage, expressed as a percentage of tail DNA, in vegetarians (3.6 ± 1.1%) compared to non-vegetarians (2.8 ± 1.0%), with the lowest DNA damage observed in pescatarians (2.4 ± 1.1%). These RESULTS suggest that a pescatarian diet may offer greater benefits for preserving DNA integrity, warranting further research in this area.

CONCLUSIONS

While potential risks like exposure to toxic metals (e.g., mercury) and microplastics from fish exist, a substantial body of evidence, including our findings, indicates that the health benefits of fish consumption may outweigh these risks. Our RESULTS highlight the need for additional studies to better understand how specific dietary choices can influence DNA integrity and, ultimately, human health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

1. https://www.tandfonline.com/doi/full/10.1080/10408398.2021.1986464
2. https://www.mdpi.com/2072-6643/15/9/2218

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SOAP 22 - THE FUTURE OF NUTRITION RECOMMENDATIONS

SOAP22_01

THE EFFECT OF CALISTHENICS TRAINING ON ESTIMATED VO_2MAX VALUES IN COLLEGE STUDENTS

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BACKGROUND AND OBJECTIVES

Cardiorespiratory fitness (VO_2max) among college students is worryingly low, with more than 50% of students categorized as unfit (<41,7 mL/kg/min) (Oktaviani, 2019; ACSM, 2014). This study was conducted to determine the effect of calisthenic training and running on estimated VO_2max values.

METHODS

A quasi-experimental study design on 21 male college students was conducted in August to October 2024. Subjects were divided into two groups: the intervention group (n=10) and the control group (n=11). The intervention group received treatment in the form of calisthenics for 40 minutes, and the control group received running treatment for 20 minutes, with both undergoing interventions for 4 weeks with a frequency of twice a week. Body weight, height, nutritional status, estimated VO_2max values, body fat percentage, muscle mass, academic stress levels, sleep quality and macronutirent intake data were measured pre-and post training and were analyzed using independent and dependent t-tests.

RESULTS

The RESULTS showed a significat ($p<0.05$) increase in the average estimated VO_2max values in both the intervention group (by 3.5 mL/kg/min) and the control group (by 11.4 mL/kg/min) and there was a significant decrease in average body fat percentage in both the intervention (by 0.6%) and the control group (by 0.8%). Although, there was an increase in average muscle mass in both the intervention (by 0,5 kg) and the control group (by 0,1 kg), the differences between both groups showed no significant RESULTS. There were no significat RESULTS in the average estimated VO_2max values based on academic stress levels, sleep quality, and macronutirent intake.

CONCLUSIONS

It can be concluded that both the increase in estimated VO_2max values and the decrease in body fat percentage were highly effective in the control group (running) compared to the intervention group (calisthenics), but the increase of muscle mass were higher in the intervention group (calisthenics) compared to the control group (running).

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP22_02

NUTRITIONAL QUALITY AND ENVIRONMENTAL IMPACT OF DIETS IN THE DUTCH ADULT POPULATION CHARACTERIZED BY NUTRI-SCORE

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BACKGROUND AND OBJECTIVES

The Front-of-Pack nutritional label Nutri-Score, which aims to guide consumers in making food choices, has been implemented in the Netherlands since 2024. Previous studies have shown the alignment of Nutri-Score with national food-based dietary guidelines (FBDGs) and its ability to discriminate foods based on nutritional quality, while studies based on the environmental impact of foods are limited. As the majority of these studies were carried out on the food level, the present study aims to the investigate the nutritional quality and environmental impact of diets in the Dutch adult population characterized by Nutri-Score.

METHODS

1747 adult participants (aged 18-79) in the Dutch National Food Consumption Survey (2019-2021) were included, from which food consumption data were obtained using two non-consecutive 24-hours dietary recalls. These data were combined with food composition data from the Dutch Food Composition Database (NEVO 2023/v8.0) and environmental impact data from the Dutch Life Cycle Assessment Food Database (LCA 2024). Participants were categorized into quintiles (Q1-Q5) of the Nutri-Score nutrient profiling model dietary index (NS-NPM DI), which was calculated as the mean continuous Nutri-Score of foods consumed weighted for energy intake at individual level per day. Chi-square and Kruskal-Wallis tests were performed to identify significant differences (p <0.05) between quintiles of NS-NPM DI for socio-demographic characteristics and daily food consumption (by food group), nutrient intake (energy, salt, sugar, saturated fatty acids (SFA), protein, and fiber), and environmental impact indicators (greenhouse gas emissions (GHGe) and blue water consumption) of consumed foods.

RESULTS

Preliminary RESULTS show that participants in Q1 have significantly different daily nutrient intakes than Q5, such as for sugar (75.3 vs 95.6 g), salt (4.4 vs 6.1 g), SFA (21.8 vs 36.7 g) and fiber (24.9 vs 16.9 g). Daily food consumption differed significantly between Q1 and Q5 by most food groups, such as fruits, nuts and seeds, olives (231 vs 130 g), vegetables (217 vs 127 g) and cakes and biscuits (42 vs 70 g). GHGe and blue water consumption were both significantly different between Q1 and Q5 (3.5 vs 3.8 g and 0.098 vs 0.070 g respectively).

CONCLUSIONS

The present study showed discrimination in the nutritional quality and environmental impact of diets in the Dutch adult population as characterized by Nutri-Score. Findings suggest that changing food choices based on Nutri-Score can improve diets in the Dutch adult population to align with FBDGs and in terms of health as well as environmental impact.

CONFLICTS OF INTERESTS

Elisabeth Temme is member of the international Scientific Committee of Nutri-ScoreElly Steenbergen is member of the international Technical Committee of Nutri-ScoreJoline Beulens is member of the international Scientific Committee of Nutri-Score

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SOAP22_03

ASSOCIATION IN EATING BEHAVIOR AND NUTRITIONAL STATUS IN CHILEAN PRESCHOOLERS ACCORDING TO THE METHOD OF INITIATION OF COMPLEMENTARY FEEDING

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BACKGROUND AND OBJECTIVES

Nutrition during the first 1,000 days of life is critical for optimal development. Complementary feeding, which begins at 6 months of age, provides an opportunity to establish healthy eating habits and behaviors that can persist long-term. Complementary feeding can be initiated using the traditional method (caregiver-regulated purees), Baby-Led Weaning (BLW), or a mixed approach.

Objective: To evaluate eating behavior and nutritional status in Chilean preschoolers who began complementary feeding using the traditional method, BLW, or a mixed approach.

METHODS

A cross-sectional study with convenience sampling (n=170 children aged 2 to 5 years) from the Metropolitan Region of Chile. An online questionnaire was administered to assess eating behavior using the Children Eating Behavior Questionnaire. Nutritional status was evaluated through self-reported weight and height. Statistical analysis was performed using the Kruskal-Wallis test or ANOVA ($p<0.05$). Ethical approval: PG_2023-07.

RESULTS

Forty-two point four percent (42.4%) of preschoolers started complementary feeding with the traditional method, while 28.2% began with BLW. Regarding nutritional status, 57.6% of the children were classified as having normal weight, and 26.5% were classified as overweight or obese. In terms of eating behavior, children who started complementary feeding with BLW scored higher on food enjoyment ($p = 0.000$), and lower on eating slowness ($p = 0.005$) and food demandingness ($p = 0.001$) compared to those who started with the traditional method. No significant differences in nutritional status were observed based on the method of feeding initiation.

CONCLUSIONS

These RESULTS suggest that choosing the BLW method or a mixed approach to initiate complementary feeding may positively influence certain aspects of long-term eating behavior, particularly food enjoyment and food selectivity, but does not appear to impact nutritional status. However, recommendations to parents should consider their individual preferences when selecting the method for introducing complementary foods.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP22_04

MARKERS OF ULTRA-PROCESSED FOODS: EVALUATING THE EFFECTIVENESS OF FOOD ADDITIVES TO IDENTIFY ULTRA-PROCESSED FOODS IN 5 LATIN AMERICAN COUNTRIES

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BACKGROUND AND OBJECTIVES
Operational METHODSto identify ultra-processed foods (UPFs) for regulatory purposes remain under active discussion (1). Certain functional classes of additives, such as colors, flavors, emulsifiers, and low-calorie sweeteners, have been proposed as effective markers of ultra-processing (MUPs) (2,3). This study aimed to evaluate the use of different food additives for identifying UPFs.

METHODS

This cross-sectional study analyzed labeling data from food and beverage products sold in supermarkets in Brazil (2017; n=8,806), Chile (2018; n=11,924), Colombia (2018; n=8,366), Ecuador (2019; n=1,980), and Mexico (2017; n=15,651). Products lacking an ingredient list or without added sugar, salt, fat, or additives were excluded from the analysis (n= 5,739). Food items were classified as UPFs based on the presence of at least one MUPs, including cosmetic additives (e.g., functional classes related to colorants, flavorings, emulsifiers, thickeners) and substances used for non-culinary purposes (e.g., maltodextrin, protein isolates, interesterified fats) (4). Then, we evaluated how closely classifications based solely on the presence of specific Codex Alimentarius-listed additives (5), such as colors, flavors (including flavor enhancers), emulsifiers, and low-calorie sweeteners, matched the broader classification. Sensitivity (Se), specificity (Sp), and their combined score (Se+Sp) were calculated for individual and combined functional classes.

RESULTS
Of 44,584 products, 72.3% were classified as UPFs, with country-specific rates ranging from 70.6% in Mexico to 76.9% in Ecuador. Food categories that most accounted for UPF were bakery products (16.1%), confectionery (15.4%), dairy products (13.5%), and beverages (12.6%). Individually, flavors had the highest combined Se+Sp (Sp:95.0%; Se:78.4%) for detecting UPFs. Combinations of low-calorie sweetener & flavors (Sp:94.0%; Se:79.2%), colors & flavors (Sp:87.5%; Se:84.7%), and low-calorie sweeteners & colors & flavors (Sp:86.5%; Se:85.3%) showed the highest Se+Sp. Using all functional classes combined maximized sensitivity (94.2%) but decreased specificity (71.8%). These RESULTS were consistent among countries.

CONCLUSIONS

Flavors, alone or in combination with low-calorie sweeteners and colors, seem to be highly effective markers for identifying UPFs. These findings can support the development of standardized approaches to identify UPFs consistently across different countries.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP22_06

ARTIFICIAL INTELLIGENCE DRIVEN NUTRITIONAL RISK ASSESSMENT AND DIETARY RECOMMENDATIONS FOR CHRONIC DISEASES

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BACKGROUND AND OBJECTIVES
With the increasing incidence rate of chronic diseases, nutrition intervention has become an important means to prevent and manage chronic diseases. However, traditional nutritional assessment METHODSare often time-consuming and lack personalization. In recent years, the development of artificial intelligence (AI) technology has provided new opportunities for chronic disease nutritional risk assessment. Our research aims to use AI technology combined with population nutrition big data to develop an efficient and accurate chronic disease nutrition risk assessment model, providing personalized dietary recommendations for individuals to reduce chronic disease risk.

METHODS

We collected comprehensive data from the U.S. Department of Agriculture's Food and Nutrient Database for Dietary Studies (FNDDS), the National Health and Nutrition Examination Survey (NHANES) cohort, and relevant literature. Using machine learning techniques, we developed an innovative model for predicting chronic disease nutrition risk, which was rigorously evaluated through cross-validation and an independent test set. This model leverages users' dietary habits to digitally represent individual eating patterns and automatically assess their nutrition risk levels. Furthermore, we designed a Diet Optimization Algorithm (DOA) to provide dietary recommendations that minimize chronic disease risk.

RESULTS

Through the comparison of various machine learning algorithms, we found that the Random Forest model, after undergoing parameter optimization, exhibited the most superior performance. Specifically, it achieved an accuracy of 0.9393, a precision of 0.9541, and an AUC value of 0.975 on the test set. Our model can quickly identify the level of chronic disease risk associated with individual dietary patterns, and combined with our independently designed Dietary Optimization Algorithm (DOA), it can quickly screen and recommend recipes with low chronic disease risk.

CONCLUSIONS

Our research reveals the immense potential of AI technology in chronic disease nutrition risk assessment and dietary recommendations. By automating and personalizing nutritional evaluations, AI can significantly aid in the prevention and management of chronic diseases. This study, however, has certain limitations, including a restricted sample size and insufficient data dimensionality. In the future, we will continue to expand the sample size and collect data from more dimensions to further improve the accuracy and applicability of the model.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP22_08

VITAMIN A5 – DEFINITION OF A NEW VITAMIN WITH A FOCUS ON DIETARY INTAKE OF VITAMIN A5

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BACKGROUND AND OBJECTIVES

A new vitamin, vitamin A5 has been proclaimed. This vitamin constitutes an umbrella term for compounds that activate the retinoid X nuclear hormone receptor (RXR), and include e.g. 9-*cis*-13,14-dihydroretinol, and further 9-*cis*-beta-carotene (9CBC) as provitamin A5. Here, we present the scientific rationale and the basis for this concept of this new vitamin and evaluate and elucidate still missing knowledge, with a focus on recent estimates of vitamin A5 intake levels in European populations [1].

METHODS

Earlier studies have shown that vitamin A5 acts independently from vitamin A1 (all-*trans*-retinol and related compounds) and cannot be endogenously self-derived. Likewise, vitamin A5 was clearly shown, based on animal trials, to induce activation of RXR, acting as partner with e.g. RARs, LXRs and PPARs, to regulate a large number of cellular mechanisms related to cell proliferation and immune responses, among other [2]. Specifically, low vitamin A5 intake or status has been associated with poor mental health and increased incidence of neurological diseases [1]. A required amount for humans of 1.1 mg/day has been proclaimed [3]. Here we present, for the first time, intake estimations of the European population, combining data available regarding occurrence of dietary provitamin A5 / 9CBC (the main abundant precursor of vitamin A5 in the diet), and intake data from EFSA's food consumption database [4] and the EPIC cohort [5].

RESULTS

More mechanistic studies relating a defined vitamin A5 deficiency or markers of it are partly missing. Regarding dietary intake, main contributors were fruits and vegetables with highest concentrations in leafy vegetables, with a range of 0.1 – 39.4 µg 9CBC/g. Dietary intakes were found to vary from approx. 0.5 (Austria) to 1.3 (Italy) mg 9CBC/day, with an average of 0.9 mg/day. It was further calculated that large parts of European populations, around 2/3, were consuming below the previously recommended 1.1 mg/day of vitamin A5.

CONCLUSIONS

Though more mechanistic studies relating vitamin A5 deficiency to clear endpoints, such as neurological-based biomarkers, are missing, the concept of vitamin A5 has merit and should be further investigated. Dietary intake appears to be low in many European populations, especially in Northern / Central European countries, owing to the general low intake of fruits and vegetables. Further studies into vitamin A5 are warranted.

CONFLICTS OF INTERESTS

Dr. Rühl is owner of the company CISCAREX that sells dietary supplements.

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SOAP22_09

"NO PUBLIC FUNDS FOR UNHEALTHY FOODS!": DEVELOPING COMPREHENSIVE NUTRITION STANDARDS FOR HEALTHY PUBLIC FOOD PROCUREMENT AND SERVICE POLICIES

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BACKGROUND AND OBJECTIVES

In 2021, the World Health Organization (WHO) released the 'Action framework for developing and implementing public food procurement and service policies for a healthy diet'. While countries are now adapting the framework into local policies to promote healthy diets and prevent diet-related non-communicable diseases, global recommendations offering specific nutrition standards to guide these policies were lacking.

METHODS

In 2024, authors developed a comprehensive nutrition standards guide to specify what ingredients, foods, or preparation METHODScan be used in the preparation, service, or sale of food and beverages by public institutions. These multi-pronged standards were based on existing WHO nutrition guidance such as the 'five core principles of a healthy diet' within the WHO Action framework, the WHO Guidelines on sodium intake, saturated fatty acid and trans-fatty acid intake, sugars intake, and use of non-sugar sweeteners (NSS); WHO global sodium benchmarks; and WHO Healthy Diet Fact Sheet.

RESULTS

The 'Guide to developing nutrition standards for healthy public food procurement and service policies' includes five sections: 1) Standards for nutrients: limits to key nutrients of concern including trans fat and saturated fat, sodium, and sugar (and NSS); 2) Standards for food categories: includes bans on sugary beverages, sodium limits for key categories like bread and condiments, bans on processed meats, and minimum standards for whole grains, fruits and vegetables; 3) Standards for meals served and sold: guides nutrient and plate composition; 4) Standards for snacks: limits unhealthy options, e.g., ultra-processed packaged snacks, sweets, and sugary bakery items; and 5) Standards for food preparation: includes banning deep-frying foods and ensuring use of standardized recipes. A set of complementary standards are also outlined to prohibit unhealthy food marketing, promote environmental sustainability, and incorporate food safety standards.

CONCLUSIONS

This guide provides countries a framework to ensure that the criteria used for the government's purchase, service and sale of food are comprehensive, specific, measurable, and ultimately impactful. Multiple governments worldwide are using this guide to shape public food procurement and service policies, to promote healthier diets and combat non-communicable diseases through exemplary procurement and service practices.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP22_13

PERSONALIZED NUTRITIONAL INTERVENTION TO IMPROVE SHORT-TERM PERFORMANCE AND LONG-TERM HEALTH IN SHIFT WORKERS

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BACKGROUND AND OBJECTIVES

Night work is associated with disturbances in sleep and alterations in glucose homeostasis. Interventions focused on nutrition can mitigate the short-term adverse effects of shift work under controlled experimental conditions. However, it is unclear how these RESULTS translate to real life and to long-term health outcomes. The current study aims to implement a personalized nutritional intervention among night shift workers to improve short-term performance and long-term health**.**

METHODS

The study is a non-blinded, controlled intervention study of 3 months, preceded by a run-in period with baseline measurements, and follow-up after 4 and 12 months. Participants are healthy 18-60-year old male night shift workers, working for at least one year in night shifts. In the intervention group (n=25) information from the run-in period including pre- and postprandial measurements of glucose, insulin, triglycerides and cholesterol after a standardized mixed meal tolerance test is used to personalize the nutritional intervention. This consisted of personalized advice on the daily distribution of calories and macronutrients in combination with recommendations on specific food products based on continuous glucose measurements (CGM). The control group (n=10) will continue their normal sleep and nutritional habits. During the intervention, sleep and physical activity will be measured using actigraphy and a sleep diary. Food intake will be monitored with short periods of food logging. Continuous blood glucose will be measured at baseline, 1 and 4 months using a CGM for 10 days each. Performance during the night shifts will be assessed using psychovigilance tests.

RESULTS

Currently, most participants just finished the intervention period in which they followed the personalized advice. The last participants will finish the study in February 2025, and the first RESULTS are expected in March 2025.

CONCLUSIONS

With this real-life nutritional intervention study on short- and long-term effects of shift work we aim to contribute to improving health in night shift workers.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP22_15

PREDICTING IN VIVO PROTEIN DIGESTIBILITY FROM INGREDIENT COMPOSITION AND IN VITRO DIGESTION

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BACKGROUND AND OBJECTIVES

The nutritional quality of proteins depends on their indispensable amino acid profile and their digestibility. Accurate measurement of protein digestibility requires in vivo experimentation, which presents several constraints. In vitro digestion models have been developed, but presently, none of them can provide a totally reliable assessment of protein digestibility. An alternative approach, the subject of this study, could be to model protein digestibility on the basis of in vitro digestion data and/or readily available physicochemical characteristics of protein sources.

METHODS

A dataset of 47 individuals, each corresponding to a specific plant protein ingredient in a given form (seed, powder, or isolate, with or without processing), was created. Each individual was characterized by variables measured after in vitro digestion using the Infogest protocol (proteolysis degree, % soluble nitrogen), compositional traits (content of protein, lipid, carbohydrate, starch, fiber, and amino acid profile), and in vivo true N digestibility (ileal or fecal). PCA and hierarchical clustering (HAC) were applied, followed by multiple linear regression to model in vivo digestibility, with missing data handled.

RESULTS

The PCA did not reveal significant correlations between in vivo digestibility and characteristics derived from in vitro digestibility, nor with compositional traits, except for fiber content, which showed an inverse correlation (r^2 =-0.73) with in vivo digestibility. The HAC identified three clusters of individuals: those with low in vivo and in vitro digestibility, those poorly digestible in vivo, and those highly digestible in vivo and in vitro.The latter cluster was characterized by the presence of ingredients that had undergone significant processing, while the former included various forms of chia. Several highly significant (p-value<10-6) regression models were established, with the best performing (r^2=0.777, p-value=4.8e-08) modeling in vivo digestibility from the degree of proteolysis measured in vitro, content of fibers and protein content in Arg, His, Ile, Lys and Pro.

CONCLUSIONS

This preliminary study shows potential for predicting in vivo digestibility of plant protein ingredients using easily accessible measurements, which could reduce the need for in vivo experiments. However, further validation is required, both by expanding the dataset with more diverse, well-characterized ingredients and by using cross-validation. These approaches are currently being explored.

CONFLICTS OF INTERESTS

Séverine Olivier and Sophie Vinoy are employed by Mondelez. Capucine Picard's PhD scholarship is funded by Mondelez

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SOAP 28 - THE FUTURE OF NUTRITION RECOMMENDATIONS

SOAP28_01

DEVELOPMENT AND EVALUATION OF A SELF-ADMINISTERED WEB-BASED DIETARY ASSESSMENT TOOL FOR ASSESSING DUTCH HABITUAL DIETARY INTAKE AGAINST A WEB-BASED DIETARY 24-H RECALL TOOL (COMPL-EAT™): THE NUTRI+ MODULE

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BACKGROUND AND OBJECTIVES
In nutrition research, it is important to validly assess dietary intake. However, dietary assessment METHODSare often burdensome, time-consuming or do not provide habitual food intake. Therefore, we developed the web-based Nutri+ questionnaire to assess a person's habitual dietary intake in a quick and easy way. This study evaluated the validity and reproducibility of the Nutri+ questionnaire compared to the web-based 24-h recall Compl-eat™ in assessing habitual food intake.

METHODS

The online questionnaire assessed dietary intake for 21 food groups, of which 17 are quantitative and 4 are qualitative, depending on dietary guidelines for that food group. A cross-over validation study was conducted in 312 healthy Dutch adults (≥35 years). The Nutri+ questionnaire was completed on a randomly selected day. Compl-eat™ was filled in online on four random non-consecutive days. The questionnaire and the recall were completed on two occasions (wave 1 and 2) in reverse order.

RESULTS

When comparing the mean intake of Compl-eat™ with Nutri+, the correlation coefficient for 14/17 quantitative food groups ranged from 0.43 to 0.90, indicating acceptable (r =0.20-0.49) to good (r ≥0.50) agreement. The three remaining quantitative food groups had correlation coefficients of 0.16 to 0.30, indicating poor to acceptable agreement. The correlation coefficient of the mean intake of wave 1 compared to wave 2 of Nutri+ ranged from 0.56 to 0.93, indicating good agreement for all quantitative food groups. For the four qualitative food groups, the kappa values were low (κ <0.20), showing no to low agreement, indicating a need for improvement.

CONCLUSIONS

The Nutri+ questionnaire is an appropriate tool for assessing habitual food intake. The mean intakes of Nutri+ compared to Compl-eat™ showed an acceptable to good agreement. Furthermore, the Nutri+ questionnaire showed a good reproducibility. Insights in dietary intake assessed with Nutri+ can be used to provide nutritional advice in the future. The next steps are to refine the questionnaire, focussing on the qualitative food groups and to improve its user-friendliness.

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CONFLICTS OF INTERESTS

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SOAP28_02

ACCEPTABILITY, USABILITY, AND USER PREFERENCES OF SMARTPHONE APPLICATIONS FOR TRACKING AND IMPROVING FOOD CHOICES AMONG ADOLESCENT GIRLS

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BACKGROUND AND OBJECTIVES

Healthy food consumption is sub-optimal for many female adolescents in low and middle-income countries, highlighting the need for improved dietary assessment tools to track their food choices. As smartphone applications (apps) for dietary assessment become increasingly popular, it is crucial to evaluate their effectiveness compared to traditional dietary assessment methods. This study aimed to assess the acceptability, usability and preferences of smartphone applications for dietary tracking among Sri Lankan adolescent girls.

METHODS

Ten FGDs (Focus Group Discussions) were conducted with 81 adolescent girls, aged 13 to 15 years from urban and peri-urban communities in Sri Lanka. The FGD guide was developed to systematically explore views of participants on using smartphone apps for recording and tracking their diets. Smartphone ownership, use of apps for meal planning, and perceptions on setting daily dietary goals based on current eating habits and Food Based Dietary Guidelines (FBDGs) through smartphone applications were investigated through FGDs.

RESULTS

The RESULTS showed a common trend of shared smartphone ownership within families, indicating general acceptance of smartphones usage. However, the primary challenge identified was resistance from family members to using smartphones during mealtime hindered daily meal tracking. The study identified diverse motivations for using smartphone apps for meal planning and setting dietary goals based on dietary habits. Participants emphasized the importance of personalization of apps, specifically setting individualized goals, receiving personalized recommendations, and tracking progress. Personalized approaches were viewed as crucial for making the apps more relevant to users' unique needs and preferences. Usability insights emphasized the key features in smartphone apps, including transformative potential, visual appeal, gamification and privacy protections.

CONCLUSIONS

Smartphone apps for dietary assessment were found to be acceptable, preferred, and usable among Sri Lankan adolescent girls. However shared smartphone ownership within families poses a major challenge to consistent usage. The findings suggest the potential of leveraging technology to address nutritional challenges among adolescent girls particularly through personalized and user-centered app features.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP28_03

CAN GENE-BASED RECOMMENDATION OUTPERFORM STANDARD WEIGHT LOSS ADVICE? A RANDOMIZED TRIAL

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BACKGROUND AND OBJECTIVES

Gene-based nutritional interventions may support weight loss, but their effectiveness compared to standard advice remains uncertain. This study compared the effectiveness of a gene-based nutrition recommendation with standard weight loss advice in improving weight loss and related health outcomes in overweight and obese adults.

METHODS

In this 12-month randomized controlled trial, adults with overweight or obesity were randomized to receive either a gene-based nutrition recommendation or standard weight loss advice during the active phase (months 0-6), followed by a free-living simulation (months 6-12, inactive phase). During the active phase, both groups received regular dietary counseling, which was reduced to a single session at month 12 during the inactive phase. The gene-based nutrition recommendation utilized an algorithm developed in-house to provide recommendations tailored to specific genetic markers, including *FTO* rs9939609 (BMI and physical activity), *UCP1* rs1800592 (caloric intake), and *TCF7L2* rs7903146 (fat intake). Primary outcomes included changes in weight, BMI, waist circumference, and body fat percentage. Secondary outcomes included changes in dietary intake, glycated hemoglobin, and lipid profile. Data were analyzed using intention-to-treat analysis, with independent t-tests for between-group differences at months 6 and 12, and paired t-tests for within-group comparisons to assess changes from baseline.

RESULTS

Of 136 screened participants, 52 were enrolled and randomized to either the gene-based nutrition recommendation (n = 29) or standard weight loss advice group (n = 23). By month 12, 27 participants completed the study (gene-based: n = 15; standard weight loss advice: n = 12). In month 6, we found no evidence of differences between the two groups in terms of primary and secondary outcomes. By month 12, the gene-based group reported lower intakes of calories (426 kcal; 95% CI, 0.56 – 0.96, P = 0.023), protein (28.5 g; 95% CI, 0.51 – 0.87, P = 0.003), and carbohydrates (39.9 g; 95% CI, 0.59 – 0.98, P = 0.036) compared to the standard weight loss advice group. No significant differences were observed in other outcomes, including weight loss, BMI, and biochemical markers.

CONCLUSIONS

While the gene-based nutrition recommendation may influence dietary intake, it did not lead to superior weight loss compared to standard weight loss advice. Further research is needed to confirm these findings and to explore the long-term effects of personalized nutrition.

CONFLICTS OF INTERESTS

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SOAP28_05

POTENTIAL OF USING A "AGRI-NUTRI-SMART" SCHOOL GARDEN: ADDRESSING NUTRITION CHALLENGES OF SCHOOL CHILDREN IN SRI LANKA

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BACKGROUND AND OBJECTIVES

Adolescents in Sri Lanka face significant nutrition challenges, including micronutrient deficiencies, wasting, and obesity, driven by socio-economic factors and lifestyle changes. School gardens, as part of school-based interventions, can significantly contribute to addressing these challenges by enhancing food literacy. However, existing school gardens are poorly organized, primarily focused on agriculture, and underutilized as platforms for nutrition education. The study aimed to identify challenges in school gardening and propose suggestions for an effective school garden intervention "Agri-Nutri-Smart" to enhance students' knowledge, and attitudes toward agriculture, and nutrition.

METHODS

This qualitative study involved in-depth interviews with 15 agriculture teachers who teach agriculture subject module from 15 schools across Sri Lanka and 10 agriculture experts (Research officers/ Agriculture Instructors/ Additional directors of Agriculture). The data was analyzed by using N-Vivo 14 software.

RESULTS

Key challenges identified included the difficulty of maintaining gardens during school vacations, insufficient financial resources, limited space, limited time for gardening activities, and children's negative attitudes toward gardening and damaged by some wild animals. Experts recommended integrating smart agriculture techniques, such as drip and sprinkler irrigation, permaculture gardening, vertical gardening and hydroponics to enhance students' hands-on experience with agricultural technology. Establishing a student-led gardening club is also crucial for promoting responsibility and ensuring the sustainability of the school gardening program. They also advocated for evaluating practical gardening activities alongside traditional classroom learning and incorporating gardening into core subjects like science. Further, integrating nutrition lessons with the gardening activities, including displaying the nutritional importance of crops, conducting cooking demonstrations using the harvest from garden were suggested.

CONCLUSIONS

In conclusion, key challenges identified were maintenance during school vacations, insufficient funding, limited space and time, negative attitudes among students, and damage caused by wild animals. Implementing "Agri-Nutri-Smart" school garden that address these challenges holds significant potential as an educational tool to enhance agriculture and nutrition literacy among school-aged children in Sri Lanka.

CONFLICTS OF INTERESTS

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SOAP28_06

METHODOLOGY FOR UPDATING THE DUTCH WHEEL OF FIVE USING DIET OPTIMIZATION: INTEGRATING HEALTH, SUSTAINABILITY AND FOOD SAFETY WHILE TAKING INTO ACCOUNT CURRENT DIETARY INTAKE

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BACKGROUND AND OBJECTIVES

The food-based dietary guidelines (FBDGs) in the Netherlands, communicated as the Wheel of Five, focus on a dietary pattern that prevents chronic diseases and provides the required nutrients, while considering aspects of sustainability and feasibility. With growing scientific consensus and endorsement of organizations such as WHO/FAO, there is a need for more integrated healthy and sustainable food recommendations, where food safety is a prerequisite for health. Also, more data has become available on environmental impact, food safety and food consumption. The aim is to develop a methodology for further development of the Wheel of Five focusing on different target groups and dietary habits in the Netherlands, equally considering health, sustainability and food safety aspects while taking into account current dietary intake.

METHODS

The methodology for updating the Wheel of Five included the following steps: (1) Define the goals that the guidelines should support, based on the scientific consensus on health (Health Counsel of the Netherlands), sustainability and food safety. (2) Define the energy and nutrient requirements, based on the dietary reference values of the Health Counsel of the Netherlands and EFSA. (3) Collect the available data on food consumption (Dutch National Food Composition Survey 2019-2021), food composition (NEVO 2023) and most recent data of the RIVM on 6 environmental impact indicators and 6 food contaminants. (4) Define food groups (83 groups on level 4) and integrate constraints regarding current dietary intake (95th percentile). An optimization model is used to calculate reference diets.

RESULTS

Reference diets will be calculated for men and women of all ages, pregnant and lactating women. Additionally, we will explore various more plant-based diets, diets low in specific foods and a diet within the planetary boundaries. We are currently working on the exact model specifications (e.g. linear or quadratic). Also, different weights can be given to current dietary intake versus environment, and to all environmental indicators individually. We would like to go into detail about these specifications during IUNS-ICN 2025. Finally, the optimization RESULTS will be translated into consistent consumer advice and visualization. Feedback from external experts will be gathered throughout the whole process.

CONCLUSIONS

This process shows our choices for integrating health, sustainability and food safety, taking into account current dietary intake, in diet optimization that can be used for future FBDGs.

CONFLICTS OF INTERESTS

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SOAP28_07

EDUCATORS' PERSPECTIVES ON FOOD LITERACY EDUCATION IN SRI LANKAN SCHOOLS: BARRIERS AND PATHWAYS TO IMPROVEMENT

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BACKGROUND AND OBJECTIVES

Malnutrition and micronutrient deficiencies are significant nutrition problems among adolescents in Sri Lanka. Schools have the potential to promote food literacy, encouraging healthy eating habits among children. However, existing research on how food literacy concepts are delivered through the school curricula is limited. This study aimed to explore educators' perceptions on food literacy education, identifying barriers and their recommendations to improve its integration in Sri Lankan secondary schools.

METHODS

In-depth interviews were conducted with 15 school principals and 22 teachers from 18 schools across Sri Lanka. The data were analyzed using thematic analysis to identify key themes emerging from the discussions.

RESULTS

The analysis emerged two key themes: (i) Barriers to delivering food literacy education for secondary school students - Educators highlighted limited inclusion of nutrition topics in core curricula, insufficient time allocation, inadequate teacher training and a lack of teaching resources as significant barriers. Food-related subjects such as agriculture and home economics, often offered as electives, were perceived by students as less important compared to core subjects, leading to low engagement and missed learning opportunities to learn food literacy concepts. (ii) Recommendations for improving food literacy education for secondary school students – Respondents recommended making nutrition education compulsory across all grades levels, incorporating practical components such as school gardening and cooking sessions into main subjects, offering teacher training programmes, providing updated teaching materials and resources for school gardening and cooking sessions and involving parents to reinforce healthy dietary habits at home.

CONCLUSIONS

Systemic changes, including curriculum reforms, teacher training initiatives, resource enhancement, and greater parental involvement is essential to strengthen food literacy education for secondary school students. Implementing these recommendations can address existing barriers and foster healthy dietary habits among adolescents.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP28_09

CREATING DEMAND FOR SUSTAINABLE AND CULTURALLY RELEVANT NUTRITIOUS PRACTICES THROUGH THE APPLICATION OF SOCIAL AND BEHAVIORAL SCIENCE PRINCIPLES

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BACKGROUND AND OBJECTIVES

In today's industrialized food systems, more countries face a double burden of malnutrition. Transitioning to resilient food systems requires addressing local dietary practices, barriers and opportunities to behavioral change. This nimble evaluation, part of the Nutrition in City Ecosystems (NICE) project, aimed to test the impact of a social and behavioral change intervention "Smart Food Tips" on household-level adoption of co-designed nutritious recipes. Guided by the COM-B model and EAST behavioral science principles, the intervention emphasizes making the use of local nutritious foods in regular family meals easy, enjoyable, and affordable. It includes interactive sessions targeting mainly female caregivers of children under the age of 5, who are encouraged by a facilitator, trained in behavioral change, to exchange and learn new recipes. The intervention also includes cooking demonstrations, where participants prepare and taste the same recipes.

METHODS

The nimble evaluation, conducted in Rwanda and Bangladesh, employed a qualitative design and descriptive analysis. A total of 137 caregivers in Bangladesh and 34 in Rwanda were surveyed ten days after participating in either an interactive session or a cooking demonstration. Data collected included:

- Recipe and message recall
- Behavioral adoption (frequency of recipes cooked at home)
- Social diffusion (whether recipes were shared with others)

RESULTS

The nimble trial RESULTS showed a high degree of behavioral adoption in both countries. Over 85% of participants reported trying at least one recipe within ten day, all respondents recalled 1–5 recipes out of 10 and over 90% recommended recipes to family or friends.

CONCLUSIONS

The nimble trial highlighted that behaviorally informed nutrition interventions can be effective in driving demand for nutritious foods. One of the most popular recipes have been adopted by two government schools in Rwanda as part of their school meal programs, demonstrating the intervention's potential spill-over effect from household to institutional behavior change. The intervention's participatory approach and cultural alignment grounded in behavioral science and human-centred design demonstrates potential for fostering sustainable behavior change.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP28_10

A DIGITAL-FIRST APPROACH WITH PERSONALIZED NUTRITION ADVICE OR MEAL BOXES LEADS TO DIFFERENT LEVELS OF WEIGHT LOSS

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BACKGROUND AND OBJECTIVES

A digital-first approach is gaining popularity in nutrition research to reduce participant burden, accelerate recruitment, and enhance study diversity. However, face-to-face interactions can be crucial for motivation, particularly in delivering personalized nutrition advice, which is often missing in fully digital studies. Therefore, we aim to understand participant experiences, assess their ability to perform self-measured anthropometrics, and evaluate the effectiveness of personalized nutritional interventions through a real-life remote study.

METHODS

The study was a randomized controlled trial with three groups: a control group that received generic advice (n=43), a personalized intervention group that received personalized advice only (n=40), and a personalized intervention plus group that received personalized advice along with personalized food boxes (n=39). The intervention lasted six weeks, during which data on anthropometry, nutritional habits, and study experience was collected. The study was entirely digital, with all data collected by the participants themselves.

RESULTS

Weight Loss: Participants who received personalized nutritional advice lost 1.0 kg on average. Those who also received personalized food boxes lost even more weight, averaging 2.5 kg.

Hip Circumference: The group with personalized food boxes also saw a significant reduction in hip circumference by 2.9 cm.

Ease of Participation: Most participants (84%) found it easy to perform their own measurements, and 92% could easily fill out questionnaires from home.

Implementation: Personalized advice was not easier or more enjoyable to follow than generic advice. However, personalized food boxes made it easier ($p<0.001$) and more enjoyable ($p<0.01$) to follow the personalized nutrition advice

CONCLUSIONS

Personalized nutrition advice, even when given digitally, is more effective for weight loss than generic advice. Personalized food boxes help translate this advice into actual diets, leading to greater weight loss and reduced hip circumference. Most participants could perform their own measurements at home, proving that fully online nutritional studies are feasible and effective.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP28_11

SMART NUTRITION: DEVELOPMENT OF AN ARTIFICIAL INTELLIGENCE-BASED, GAMIFIED PHONE APP PROTOTYPE TO TRACK AND IMPROVE THE FOOD CHOICES OF ADOLESCENT GIRLS IN SRI LANKA

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BACKGROUND AND OBJECTIVES
There is a gap in dietary intake data of adolescents in low- and middle-income countries. Up-to-date and valid dietary data will contribute to the formulation of effective nutrition policies and programs. Traditional dietary assessment METHODSare resource-intensive and may lack accuracy in estimating portion sizes consumed by adolescents. Hence, this study aimed to develop an AI (Artificial Intelligence)-assisted smartphone app functionality called FRANI (Food Recognition Assistance & Nudging Insights) to track and improve the diets of adolescent girls in Sri Lanka.

METHODS

The development of FRANI involved two major steps. (1) creating an image database to train the FRANI AI model and (2) building a comprehensive food database to feed the FRANI App. Initially, a food inventory was compiled consisting of 278 commonly consumed food items by Sri Lankan adolescent girls. For the image database, over 8000 of these priority food items were captured using a smartphone with varied photo backgrounds, plating methods, portion sizes (small, medium, large & extra large), and angles (45° & 90 °). Then, all the priority food items were cooked and prepared under a controlled laboratory setting. A food database was developed integrating recipes, ingredient lists, and nutrition composition data of raw ingredients. The captured images were linked to the database and annotated to train a semantic segmentation AI model.

RESULTS

The newly developed FRANI app offers several key functionalities including (1) the ability to recognize different dishes, foods, and portion sizes when a phone is held over a meal; (2) assistance in accurately recording meal information and (3) personalized feedback to nudge users towards healthier dietary choices based on established dietary guidelines. In addition, the app tracks food group consumption and generates statistics such as Dietary Diversity Scores (DDSs) and Sustainabale Healthy Diet Score (SHDS). It also provides data on macro and macronutrient intakes.

CONCLUSIONS

FRANI has the potential to significant improve the dietary data collection by providing high-quality, frequent data. Additionally, it could serve as an effective tool for promoting healthy eating habits through personalized dietary nudges.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP28_12

DIETARY INTAKE BASED ON NOVA CLASSIFICATION ACCORDING TO SELF-REPORTED DIETARY PRACTICES AMONG PARTICIPANTS OF THE NUTRINET-BRASIL COHORT STUDY

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BACKGROUND AND OBJECTIVES

Alternative dietary practices based on reducing the consumption of animal-based foods (e.g., veganism and vegetarianism) are becoming more prevalent worldwide. While these practices are often associated with a healthier diet, studies have shown a high consumption of ultra-processed foods among individuals adhering to these practices. This study aimed to describe dietary intake based on the Nova classification according to self-reported dietary practices among participants of the NutriNet-Brasil Cohort Study.

METHODS

A cross-sectional analysis was conducted using data from the NutriNet-Brasil Cohort, a web-based study initiated in 2020. Adults aged 18 years and older voluntarily participated by periodically completing questionnaires about their diet, sociodemographic characteristics, and health status. Those who completed at least three 24-hour dietary recalls (each six months), reported the same dietary practice in all the three surveys and provided complete sociodemographic information were included in this study. The dietary practices analyzed were "No Red Meat," "Vegetarian," "Vegan," and "Omnivorous". Sociodemographic variables included gender, race/skin color, age, macroregion of residence, education level, and income. Dietary intake was described as the caloric percentage of each Nova group, averaged across the three recalls for each dietary practice. The contribution of each Nova group to dietary intake across practices was compared using multivariate linear regression.

RESULTS

The sample (n=27,067) was predominantly female (80.7%), aged 30–39 years (30.1%), of white race/skin color (71.4%). Among participants, 91.8% were omnivorous, 1.7% did not consume red meat, 4.7% were vegetarians, and 1.8% were vegans. Vegans exhibited the highest intake of fresh and minimally processed foods (53.7%), followed by non-red meat consumers (50.6%), omnivores (48.9%), and vegetarians (47.0%). However, vegans also showed the highest consumption of ultra-processed foods (26.3%), followed by omnivores (22.6%), vegetarians (21.7%), and non-red meat consumers (20.4%). The ultra-processed food subgroups contributing most to the high intake among vegans included plain and flavored soy milk, plant-based cheeses and yogurts and industrialized soy-based products.

CONCLUSIONS

Ultra-processed food consumption was higher among vegans, highlighting the need for public policies and health initiatives to promote healthy eating in alignment with the recommendations of the Brazilian Dietary Guidelines.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP28_15

THE NIGERIAN HEALTHY FOOD ENVIRONMENT POLICY INDEX: IDENTIFYING POLICY GAPS AND POLICY ACTIONS THROUGH NATIONAL EXPERT PERSPECTIVES

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BACKGROUND AND OBJECTIVES

Nigeria, like many low- and middle-income countries, faces the dual burden of malnutrition. Effective food environment and nutrition policies are crucial in addressing this issue, yet gaps in implementation persist. This study employed the Healthy Food Environment Policy Index (Food-EPI) tool to assess Nigeria's progress in implementing internationally recommended food environment policies and priorities to promote healthy food environment and nutrition.

METHODS

A panel of 33 government and independent experts rated 37 government actions to improve the healthiness of food environment and nutrition in Nigeria using the food-EPI policy and infrastructure support good practice indicators. These actions were rated according to policy cycle stages and level of implementation against international best practices. The panel also prioritised 34 government actions for improving the Nigerian food environment.

RESULTS

A significant proportion (56.8%) of the rated policy actions were identified as still in the development stage, while 97.3% of the good practice indicators were reported to be at very low or low levels of implementation. Policy priorities included enforcing nutrient declaration regulations on food labels and implementing front-of-pack labelling, which were ranked as the highest priorities. Other highly ranked policy actions focused on restricting marketing to children, establishing limits on sugars and trans fats, and implementing fiscal policies such as taxes on unhealthy foods and subsidies for healthier options. Among infrastructure support actions, the review and update of the national food-based dietary guidelines was ranked as the highest priority. Additional highly ranked infrastructure actions emphasized the need for strengthened funding, governance, and systems for monitoring and intelligence.

CONCLUSIONS

The study revealed significant gaps in the implementation of Nigeria's food environment and nutrition policies, underscoring the urgent need for targeted actions to address these deficiencies. The expert-identified priorities provide a strategic roadmap for advancing policy development and implementation. Key recommendations include updating and enforcing food labelling regulations, enhancing the nutritional quality of foods, and formulating effective strategies for food promotion and pricing policies. Additionally, revising the national dietary guidelines and bolstering governance, funding, and monitoring systems are critical to ensuring sustainable progress. By addressing these priorities, Nigeria can strengthen its food environment, mitigate the dual burden of malnutrition, and achieve better health outcomes.

CONFLICTS OF INTERESTS

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SOAP 43 - THE FUTURE OF NUTRITION RECOMMENDATIONS

SOAP43_01

EXPLORING APPROACHES TO DERIVE A POPULATION-SPECIFIC CUTOFF POINT FOR RETINOL BINDING PROTEIN TO DEFINE VITAMIN A DEFICIENCY AMONG YOUNG CHILDREN

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BACKGROUND AND OBJECTIVES

Vitamin A deficiency (VAD) is a leading cause of morbidity and mortality among young children in low- and middle-income countries. Commonly used biomarkers to assess population vitamin A status are serum retinol (SR) and retinol binding protein (RBP), with VAD defined by WHO as SR<0.70 µmol/L, not adjusted for inflammation, but equivalent RBP cutoffs are not yet established. Because SR and RBP are assumed to have an equimolar relationship during adequate vitamin A status, current practice uses a simple linear regression (SLR) to ascertain a population specific RBP cutoff equivalent to SR<0.70 µmol/L in at least a subsample of survey participants. However, Pearson's correlation (Rho) between SR and RBP has varied between 0.4–0.9 in recent surveys, suggesting RBP might not be an appropriate proxy for SR; this may also result in notably different VAD estimates. Hyporetinolemia occurs during inflammation and current practice does not address whether SR and RBP values should be adjusted for inflammation before SLR. We aimed to explore effects of inflammation adjustment on equivalent RBP threshold among young children.

METHODS

This study will assess the potential influence of inflammation adjustment on SR-RBP Rho and RBP cutoffs to define VAD using data from Burkina Faso (paired sample N=645), Rwanda (paired sample N=2385), and Nepal (paired sample N=200) among children aged 6-59 mo.

RESULTS

In Burkina Faso, Rwanda, and Nepal, the inflammation-adjusted SR-based “true” VAD prevalence was 49.2%, 7.0% and 7.5%, respectively. The SR-RBP Rho (not inflammation adjusted) were 0.57, 0.45, and 0.83, respectively, with corresponding SR<0.70 µmol/L equivalent RBP threshold of 0.72, 0.88 and 0.77 µmol/L. The analogous inflammation-adjusted RBP-based VAD prevalence was 44.7%, 27.8% and 9.0%, in each country. Inflammation adjusting SR and RBP before SLR increased RBP thresholds in all three countries (0.03 – 0.04 µmol/L) but had negligible effects on the RBP-SR correlation (Burkina Faso Rho: 0.55; Rwanda Rho: 0.45; Nepal Rho: 0.81).

CONCLUSIONS

RBP-SR correlations differed notably across the three countries, as did the extent to which RBP-based VAD prevalence estimated the “true” burden of disease. Adjusting for inflammation did not improve SR-RBP Rho but increased the equivalent RBP thresholds. These RESULTS suggest that RBP may not be a valid proxy for SR in all settings and highlights the difficulty in developing an appropriate and consistent method to determine equivalent RBP cutoffs in surveys.

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CONFLICTS OF INTERESTS

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SOAP43_02

EAT UP! A MICROANALYSIS OF PARENTAL REQUESTS TO 'FINISH THE PLATE' DURING FAMILY MEALTIMES ACROSS THE NETHERLANDS, ITALY, AND THE UNITED KINGDOM

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BACKGROUND AND OBJECTIVES

As sustainable eating practices are urgently needed for both global and population health, eating up all of the food on one's plate is not only a social issue but also one that is morally, economically, and environmentally bound. While research has already documented challenges faced by parents in encouraging children to eat up their food, details about how parental requests to finish the plate unfold and are managed in child-parent interaction during everyday mealtimes are much less known yet highly relevant for food consumption. This study thus focuses on an underexplored phenomenon: how parents and children evoke and negotiate the rule of 'finishing the plate' or 'eating up' during family meals.

METHODS

The data corpus comprises video recordings of 187 family meals across the Netherlands (ten families, 79 meals), Italy (six families, 28 meals), and the United Kingdom (three families, 80 meals). Recordings were analysed using discursive psychology and conversation analysis – qualitative, inductive methodologies for the analysis of real-life talk-in-interaction. Discursive practices of 'finishing the plate' and 'eating up' were analysed in 159 instances, focusing on patterns across the corpus.

RESULTS

Systematic and detailed analyses of all instances resulted in the identification of 12 different discursive practices deployed by parents and children. Examples include directives by parents to eat up, occurring either in response to children displaying or pre-empting not eating up, or in context of progressing the meal; children initiating sequences about having finished their food, making its relevance explicit; and parents' and children's orientations to 'finishing the plate' as consequential to another event.

CONCLUSIONS

This study demonstrates how discursive practices used by parents and children during family mealtimes achieve different social actions in their respective interactional contexts, and that the deployed discursive practices have implications not only for food consumption but also for how children are socialised into eating habits. The analysis points to specific discursive practices that could be adapted to increase children's involvement in deciding how much to eat as well as easing parental burden. The study contributes to the future of nutrition recommendations by providing detailed evidence on how to connect to 'eating up' and 'finishing the plate' conversations in families' everyday life. As such, the study has implications for enhancing adequate nutrition intake and reducing food waste within the contemporary focus on global climate and sustainability.

CONFLICTS OF INTERESTS

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SOAP43_04

RED MEAT INTAKE AND DIET-RELATED GREENHOUSE GAS EMISSIONS INCREASED WITH AGE AMONG CHILDREN IN CANADA

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BACKGROUND AND OBJECTIVES

There has been a surge of interest in sustainable diets due to the growing climate crisis across the globe. In response, various research works have explored the nutritional and environmental implications of dietary intake among consumers, often focusing mainly on adult consumers while largely excluding children. Understanding the dietary intake patterns and their environmental impacts across the growth of young consumers is essential in developing effective interventions to inculcate sustainable eating habits among consumers as they grow. In this study the dietary intake patterns, environmental impact and diet cost food consumption of children in Canada were investigated.

METHODS

Dietary intake data from the 2015 Canadian Community Health Survey (CCHS 2015) were examined with the SPSS Statistical software as well as Microsoft Excel models. Environmental impact data from dataFIELD and Our World in Data were sourced and matched with various food components for environmental impact calculations. Also, food price data from the Food Price Hub of Statistics Canada were employed to compute the dietary cost.

RESULTS

The RESULTS obtained indicated that dairy is the most consumed animal-sourced food among children aged 1 to 13 years in Canada. Children in the Saskatchewan province consumed the most dairy per day (535 g/person/day), followed by children in Quebec (528 g/person/day) and British Columbia recording the least consumption (406 g/person/day). Children also consumed significant amounts of red meat, which are often associated with higher human and environmental health risks. Dairy accounted for a significant share of the GHGEs (36% - 51%) associated with dietary intake among children in Canada. It was also observed that red meat consumption rates increased as the children get older while dairy consumption rates decreased. Consequently, their associated environmental impacts per day per child changed correspondingly.

CONCLUSIONS

Regardless of their environmental impacts, red meat and dairy remain significant sources of diet-based calcium and iron intake, necessary for healthy ossification and anemia prevention in children. It was noted based on the obtained RESULTS that, although an elimination or reduction in animal-sourced food consumption would favor sustainable dietary shifts, it is necessary to consider age-specific reduction scenarios to ensure equitable and inclusive healthy sustainable dietary patterns in Canada.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP43_06

CRITERIA FOR ENVIRONMENTALLY SUSTAINABLE AND HEALTHY FOOD OFFERING IN PUBLIC RESTAURANTS IN THE NETHERLANDS

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BACKGROUND AND OBJECTIVES

Global challenges such as climate change, resource depletion, and rising chronic diseases necessitate more environmentally sustainable and healthy food consumption. With a sustainable and healthy catering in public restaurants, the government can set a positive example, promote beneficial food choices, and create a market for sustainable products. The Netherlands Nutrition Centre has developed criteria for healthy and sustainable catering, intended to become procurement requirements for the national government and usable by corporate restaurants to reduce environmental impact and improve health.

METHODS

Initially, a scientific background document was established to identify the most impactful strategies, considering both environmental sustainability and health. Consultations with field experts followed to determine which criteria are feasible, measurable, and effective. These criteria are intended to become procurement requirements for the national government.

RESULTS

The criteria for sustainable and healthy public procurement on catering include the following key strategies:

1. Shifting from mainly animal-based to at least 60% plant-based proteins as well as offering at least one plant-based option per product group.

2. Reducing the offering of unhealthy foods with at least 60% healthier options.

3. Measuring food waste and providing an action plan to prevent it.

4. Increasing the use of environmental sustainability labels (premium labels such as organic) on coffee, tea, animal products and fruits and vegetables.

5. Involving and educating catering staff in on-boarding.

6. Promoting healthier and more sustainable food choices through placement, pricing, and advertisement.

CONCLUSIONS

Implementing these strategies reduces environmental impact and promotes healthier, sustainable food offering in public restaurants. This contributes to healthier and more sustainable food consumption and has the potential to increase sustainable food production. It sets a norm in the public catering sector and serves as a baseline for any procurement aiming to lower environmental impact and enhance public health in restaurant setting.

CONFLICTS OF INTERESTS

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SOAP43_07

DESIGNING AND DEVELOPING A POPULATION/LITERATURE-BASED WESTERNIZED DIET INDEX (WDI) AND ITS RELEVANCE FOR CARDIOMETABOLIC HEALTH

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BACKGROUND AND OBJECTIVES

Recent research indicates a global transition in eating patterns from healthy diets to Westernized diets (WD). Furthermore, noncommunicable diseases (NCDs) have become a significant worldwide health issue in recent decades. It is evident that dietary habits have a major impact on the incidence of NCDs, including metabolic syndrome (MetS). Therefore, the objective of this study was to develop a Westernized Diet Index (WDI) to assess adherence to WD and its association with main cardiometabolic health issues, for which MetS and its components was chosen.

METHODS

The development of the WDI was driven by a thorough examination of the literature that evaluated the influence of WD components on various health outcomes. The scoring system in this index included several steps, giving scores to study design, sample size, and the effect direction of the foods on the health outcomes.

RESULTS

The final developed index encompassed a total of 30 food groups/items, following the evaluation of 504 articles, and indicated that soft drinks, processed foods, red meat, sodium, and hydrogenated fats had the most detrimental influence on cardiometabolic health, while dietary fibre, plant-based metabolites, vitamins, minerals, nuts and seeds, and fish had the most significant beneficial impacts. In this regard, the WDI aligns not only with the existing literature on the importance of certain food items, but also with other verified diet quality indices.

CONCLUSIONS

This index provides a reliable tool for evaluating the quality of one's diet and their adherence to the WD, as well as determining its association with health outcomes. As a result, this index can assist clinicians and researchers in formulating evidence-based dietary suggestions, as well as strategies for the prevention and treatment of diet-related health issues, both on an individual and community scale. However, to verify the index's capability across different contexts, further investigation and validation are required to refine the WDI and validate it with existing data.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP43_08

DECOLONISING NUTRITION RECOMMENDATIONS

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BACKGROUND AND OBJECTIVES

Colonialism has impacted the world in many different ways [1,2]. Food transitions have been the result of complex environmental, societal and political changes, often related to the exchanges resulting from colonisation [1]. The consequences for people, culture, policy and the economy were extensive and continue to this day. Addressing the legacy of colonialism can contribute to overcoming inequalities and has become an important field of research. However, the impact of colonialism on today's dietary recommendations and food-based dietary guidelines is not well understood and needs to be adressed [3,4].

METHODS

Building upon the literature on decolonising global health [5] and food systems [6], this communication proposes a decolonised framework for future dietary guidelines.

RESULTS

Parallels exist between settler colonialism and the food system. Although guidelines should be ideally adapted to local culture and food production, many still represent the ideology of superior vs inferior foods, and the messages are mixed between nutrients, food and environmental sustainability. Colonisers imposed their dietary habits and culture on conquered indigenous societies, creating a hierarchy of foods that stigmatized local foods.

Further, nutrition recommendations have been instrumental of what we can call *dietary colonialism*, as they reflected the economic priorities of the industrialised West. Food groups were created and guidelines issued containing globalized items. But also, food aid, intended to fight against malnutrition, affected local food security and undermined traditional diets, and played a detrimental role.

CONCLUSIONS

Future dietary guidelines must be evidence-based, and adapted to climate and food security challenges. At the same time, guidelines need to take into account individual preferences and cultural traditions while adhering to healthy eating principles.

A decolonized approach embraces diverse food traditions, while co-creation ensures multiple stakeholder involvement. Respecting indigenous knowledge integrates traditional food systems for sustainability. Together, these principles promote nutritious, just, gender and culturally inclusive diets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP43_09

APPLICATIONS OF LARGE LANGUAGE MODELS IN NUTRITION AND DIETETICS: A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES

Large Language Models (LLMs) are generative AI models that excel at natural language understanding and generation (1), with possible applications in nutrition, such as dietary assessment (2) and meal planning (3). It is unclear, however, what quantity or type of research has been conducted into the use of LLMs in any area of nutrition and dietetics. This scoping review aims to identify the ways in which LLMs are being applied to any domain of nutrition and dietetics and the associated opportunities and challenges.

METHODS

The review was conducted in accordance with a pre-defined protocol (4), and included original studies from peer-reviewed journals on the use of LLMs in human nutrition or dietetics in the English language. The databases Medline, EMBASE, PsycINFO, CINAHL, PubMed, Global Health, Web of Science, Scopus, DBLP, and IEEE Xplore were searched in August 2024 using pre-defined search terms. Studies were screened for inclusion in a stepwise process involving three authors with assistance from artificial intelligence tool, ASReview. Forward and backward citation chasing was conducted for included studies. A data extraction template developed by the authors was used to record information from the studies.

RESULTS

There were 1383 unique studies identified, and after screening 41 remained for data extraction. All studies were published between 2022 and 2024. The LLMs used included GPT3.5, GPT4, Bard/Gemini, Llama 2, Bing Chat/Copilot, and UMDFood-VL. The nutrition topics studied included healthy eating, obesity, cardiovascular disease, type 2 diabetes, plant-based diets, kidney disease, inflammatory bowel disease, and malnutrition. When the tasks assigned to the LLMs in the studies were mapped to the four steps of the nutrition care process framework (5), most studies focused on nutrition assessment and intervention, with limited research on nutrition diagnosis and monitoring/evaluation. The text prompts used to instruct the LLMs varied widely with limited research on fine-tuning or training LLMs for use specifically in nutrition and dietetics. The studies focused on determining the accuracy of LLMs in hypothetical situations such as researcher-designed case studies or questions.

CONCLUSIONS

LLMs have been studied for use in various nutrition-related conditions; however, few LLMs have been designed specifically for nutrition and dietetics, and the impact of LLMs on real-world health or sustainability outcomes, nutrition and dietetic workflows, and the views of nutritionists, dietitians, patients, or the general public remains under-explored.

CONFLICTS OF INTERESTS

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SOAP43_10

THE EFFECT OF LOW DOSAGE YEAST BETA-GLUCAN 1,3/1,6 ON RESPIRATORY HEALTH, FATIGUE, MOOD, AND QUALITY OF LIFE AMONG MODERATE-STRESS ADULTS: A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY

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BACKGROUND AND OBJECTIVES

As the future of nutrition shifts towards personalised and functional approaches, natural bioactive compounds like yeast beta-glucan 1,3/1,6 (YBG) are emerging as promising dietary interventions for enhancing immune resilience and overall well-being. YBG, a polysaccharide derived from *Saccharomyces cerevisiae*, has demonstrated immune-modulating properties, making it relevant for populations experiencing stress-induced health challenges. This study aimed to evaluate the efficacy of YBG 1,3/1,6 supplementation on respiratory health, fatigue, mood, and quality of life among moderate-stress adults, emphasizing its potential role in shaping the future of preventive nutrition strategies.

METHODS

A 12-week, randomised, double-blinded, placebo-controlled, parallel-group clinical trial was conducted among 198 moderate-stress adults aged 18–59 years, identified using the Perceived Stress Scale (PSS-10; scores 14–26) and Patient Health Questionnaire (PHQ-9; scores ≥9). Participants were randomised to receive either YBG 1,3/1,6 at 120 mg or 204 mg or a placebo once daily. Key outcomes included upper respiratory tract infection (URTI) frequency and severity (WURSS-21), fatigue (MFI-21), mood (POMS), and quality of life (SF-36). Blood samples are collected at days 0 and 90 for measurements of safety parameters.

RESULTS

A total of 190 participants completed the trial (Table 2 https://icnab-03890.tiiny.site/), and the supplementation was well-tolerated. An analysis of URTI episodes throughout the 12-week period indicated a total of 96 confirmed episodes, i.e. 36 in the placebo group and 30 in each of the YBG supplementation groups (120 mg and 204 mg). Significantly, a higher percentage of no episode of URTI was observed among participants received 204mg group, which is 53% as compared to 51% among those received 120mg group and 45% in the placebo group ($p<0.05$ for all parameters). Furthermore, fatigue scores showed significant improvements, particularly in the physical and emotional domains.

CONCLUSIONS

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A three-month supplementation of 204 mg of yeast beta-glucan 1,3/1,6 may enhance respiratory health, alleviate fatigue, and improve mood and quality of life in adults experiencing moderate stress. Its immune-modulating effects and safety profile make it an ideal candidate for future preventive nutrition strategies aimed at improving population health outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP43_11

NUTRITIONAL SCORING FOR TARGETED INTERVENTION: INSIGHTS FROM THE PTFI DATA CHALLENGE, A CASE STUDY ON MEDITERRANEAN AND JUNK FOOD DIETS

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BACKGROUND AND OBJECTIVES

Understanding the molecular composition of food is crucial to effectively integrate diets into disease management and prevention. However, the lack of standardization in food composition databases, coupled with significant variations in food composition, limits their utility. This study, conducted as part of the Periodic Table of Food Initiative (PTFI) Data Challenge, addresses these challenges by developing a scoring system using the PTFI's standardized database. The system ranks foods based on their potential health impacts, paving the way for the adaptation of healthier diets and the implementation of targeted nutritional interventions.

METHODS

The following nutrients, common to most foods in the database, – monounsaturated fats, omega 3, omega 6, saturated fats, trans fats, protein, potassium calcium, magnesium, zinc, selenium, sodium and phosphorus were the basis for scoring. Sodium and trans-fat are considered unhealthy compounds and the rest considered beneficial. The ranking function evaluates the 500 foods by nutrient concentration, assigning scores (0 to 1) based on their rank for each nutrient class. Healthy compounds receive higher scores for greater concentrations, while unhealthy compounds are inversely scored. This system is validated by applying to the Mediterranean diets and the American junk food.

RESULTS

The Mediterranean diet achieved a total score of 350, outperforming the junk diet, which scored 281. This scoring system effectively highlighted the nutritional disparities between the two diets, particularly in terms of saturated fats, omega 3 fatty acids, omega-6 fatty acids, sodium, and phosphorus contents. The junk diets showed greater amounts of sodium and omega 6, while Mediterranean diets were richer in omega-3 fatty acids and zinc. These differences demonstrate the contrasting nutritional profiles, with the Mediterranean diet aligning more closely with health-promoting dietary patterns, while the junk diet reflects a composition more associated with health risks.

CONCLUSIONS

The scoring system effectively distinguished between the Mediterranean and junk food diets, demonstrating its ability to classify diets based on nutritional quality. Notably, the study showed that the Mediterranean diet can be successfully replicated in the USA, where most of the first 500 foods were sampled. This adaptability demonstrates its potential for integration into diverse cultures for dietary interventions without compromising nutritional quality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP43_12

CULTURE, TRADITION, AND TERRITORY: CONSIDERATIONS FOR A SUCCESSFUL FUTURE OF THE CHILEAN DIETARY GUIDELINES

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BACKGROUND AND OBJECTIVES

In December 2022, the Chilean Ministry of Health released the fourth version of the Food-Based Dietary Guidelines (FBDGs), newly incorporating environmental and sociocultural factors (Ministerio de Salud, 2022). The Chilean FBDGs consist of 10 recommendations that stress sustainable food systems and diets. Chile's vast length, with diverse climates and food cultures, poses challenges for implementing these recommendations within local food systems. The study aimed to identify the structure and characteristics of local food systems across Chile to better implement the new FBDGs.

METHODS

We utilized a transdisciplinary and participatory food systems-based approach to assess the linkages and contextual factors within local Chilean food systems to implement the new Chilean FBDGs by region. The study covered five regions in Chile (two in the north, one in the center, and two in the south), each with distinct climates and agricultural production. In each region, we collaborated with 45 food system actors (producers, vendors, and consumers) and Indigenous communities to co-develop and conduct mapping and surveys identifying key elements of the local food system. The survey data was analyzed to inform regional group model building workshops to identify barriers and strengths within food system actors in relation to the FBDGs. The RESULTS from each group model building workshop were subsequently analyzed to construct region-specific causal loop diagrams.

RESULTS

Local food systems that support territorial and traditional diets rich in local animal- and plant-based ingredients were identified throughout Chile. In all regions, barriers to implementing recommendations in the Chilean FBDGs were associated with fast-paced lifestyles, such as purchasing fried foods from street vendors; and national economic interests, such as intensive agriculture for agro-export. Throughout Chile, territorial diets are re-emerging with the strength of diverse food system actors, such as foundations offering children's cooking workshops, and Indigenous peoples with catering businesses as well as local restaurants that source from local producers to promote traditional diets.

CONCLUSIONS

We conclude that understanding culture is vital for the future of nutritional recommendations like the Chilean FBDGs. Implementation plans should be regionally tailored, highlighting local ingredients and culinary traditions within modern lifestyles. A universal approach risks overlooking the richness of local systems essential for households to engage with FBDGs over the long-term, with the resilience necessary to confront future food system shocks.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP43_13

A NOVEL TOOLKIT TO EVALUATE FOOD ENVIRONMENTS SUBJECT TO HEALTHY PUBLIC FOOD PROCUREMENT AND SERVICE POLICIES

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BACKGROUND AND OBJECTIVES

The World Health Organization (WHO) published *Action framework for developing and implementing public food procurement and service policies for a healthy diet* in 2021. A critical early step recommended by WHO was to "establish nutrition and other criteria" to develop policy and evaluate food environments such as schools, hospitals, and social service programs. The *Guide to developing nutrition standards for healthy public food procurement and service policies* was created to provide standards for nutrients, food categories, meals and snacks, and food preparation. We aimed to create a novel evaluation tool using these two guides.

METHODS

In 2023-24, two separate research and policy teams worked to create the toolkit in an iterative and collaborative process. First, two environments were identified: 1) where meals, snacks, and beverages are served (i.e., canteens) and 2) where packaged food and beverages are available for purchase (i.e., kiosks). Next, indicators (markers that could be written in to policy and evaluated in a food environment) were created for each standard established in the WHO and RTSL guides. Finally, the optimal method to collect indicators was determined (observation in the field, photographs, and interviews). An international team, currently engaged in a school food policy project, was consulted to review a draft of the toolkit and assess feasibility before field testing.

RESULTS

The Toolkit includes two components: 1) Tool to Assess Foods and Beverages Procured and Served for Meals and Snacks; and 2) Tool to Assess Foods and Beverages Available for Purchase in Retail Settings. The Meals and Snacks Tool includes questions related to foods and beverages served, available in the panty (e.g., dry ingredients), and available for purchase alongside any food served. The Retail Settings Tool includes questions related to foods and beverages available for purchase, and product placement. Both include questions about the environment, including advertising and marketing.

CONCLUSIONS

Governments have a responsibility to support healthy diets where they serve and sell foods. This toolkit was created to assist in the evaluation of healthy public food procurement and service policies based on WHO principles and established nutrition standards. This toolkit will be made widely available after pilot-testing. A straightforward design, low burden of data collection, and flexibility to allow for adaptation to the local context will allow for robust and standardized data collection a variety of settings in any region.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP43_14

ABSORPTION OF DE NOVO SYNTHESIZED VITAMINS IN THE HUMAN COLON

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BACKGROUND AND OBJECTIVES

Recent evidence suggests that there is significant vitamin B12 (B12) absorption from the colon.1 This raises the possibility that microbially synthesized B12 could be available for absorption, possibly explaining the surprisingly low prevalence of biochemical and clinical deficiency in predominantly vegetarian Indian populations.2,3 This hypothesis can be evaluated by tracing the synthetic pathway using stable isotopically labelled precursors for microbial B12 synthesis.

METHODS

Methods:

13C cellulose was used as a precursor for microbial B12 synthesis in humans. A single 1 g oral dose was administered to 8 adult human subjects, followed by venous blood sampling at 12, 24, 36, 42, 48 and 72 hours, after obtaining a baseline sample. A faecal sample was also taken a baseline, 24 and 48 hours. Plasma and faecal 13C-B12 were measured (as excess over baseline) at the designated timepoints, by the use of an UHPLC coupled to a mass spectrometer Q Exactive LC-HRAM-MS (Orbitrap, Thermo Scientific). Baseline faecal samples were subjected to whole metagenome sequencing to assess the relative abundance of key microbial taxa and genetic pathways for the biosynthesis of B12.

RESULTS

Subjects were aged 19-34 years (7 males, 1 female),with an average BMI of 21.8 ± 4.2 kg/m2. The average plasma active B12 concentrations were 53.8 ± 26.2 pmol/L, with 4 showing mild B12 deficiency. After 13C-cellulose administration, plasma 13C-B12 concentrations increased, with an average increase of 0.011 ± 0.007 nM/L over 3 days. This increase was similar in deficient subjects (active B12 = 31.1 ± 2.6 pmol/L), with the same value of 0.011 ± 0.010 nM/L. Based on the extracellular fluid volume, this approximates to the absorption 0.3 µg of *de novo* synthesized B12, compared to an adult daily requirement of 1-2 µg. Further RESULTS, including population pharmacokinetics and microbiome analyses, will be presented.

CONCLUSIONS

Colonic bacteria can synthesize and contribute bioavailable B12 for human absorption. These findings highlight the potential for microbiota-directed food interventions as a promising strategy to enhance bioavailability of essential nutrients like vitamin B12, paving the way for innovative approaches in nutrition and public health

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP43_15

POLICY AND FOOD SYSTEM INSIGHTS FOR DEVELOPMENT OF FOOD SYSTEMS-BASED DIETARY GUIDELINES FOR SERBIA

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BACKGROUND AND OBJECTIVES

Serbia is dealing with significant challenges such as rising non-communicable diseases (NCDs), food insecurity, and environmental sustainability issues, particularly in rural and low-income communities. The Food and Agriculture Organization (FAO) has introduced a new methodology for Food Systems-Based Dietary Guidelines (FSBDGs), aligning nutrition, health, and sustainability goals. This study aims to develop an evidence base to support FSBDGs to inform food system transformation for sustainable and health-promoting outcomes in Serbia.

METHODS

A comprehensive policy review analyzed 13 strategic national documents related to health, nutrition, agriculture, and environmental protection using the Public Policy Map and stakeholder input. Food system analysis, guided by the High-Level Panel of Experts (HLPE) framework, assessed supply chains, food environments, and consumer behavior. Data from global organizations (FAO, WHO) and national sources were synthesized to explore systemic gaps and dietary challenges. Vulnerable groups were identified and analyzed using socio-economic and demographic indicators.

RESULTS

The policy review revealed fragmentation and insufficient integration of health, nutrition, and environmental objectives. While strategies like the National Program for Obesity Prevention and agricultural development policies mention health promotion, none explicitly address FSBDGs or provide dedicated funding for nutrition actions. Environmental policies lack a focus on sustainable food systems, while social welfare strategies insufficiently address nutritional inequalities in vulnerable groups. The food system analysis highlighted over-reliance on processed foods, declining availability of fresh produce, and unsustainable agricultural practices. High greenhouse gas emissions and inefficient resource use further exacerbate systemic challenges. Socio-economic barriers, especially in rural areas, limit access to nutritious and affordable foods, worsening food insecurity and health disparities.

CONCLUSIONS

FSBDGs can inform and guide the development and implementation of integrated policies addressing health, nutrition, and sustainability challenges. By embedding FSBDG principles into national strategies, Serbia can promote sustainable agricultural practices, reduce reliance on processed foods, and enhance equitable access to nutritious foods. FSBDGs serve as a critical framework for fostering cross-sectoral collaboration and aligning policy actions with health-promoting and environmentally sustainable food systems.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP43_16

EVALUATING THE DIETARY AND HEALTHCARE IMPLICATIONS OF NON-COMPLIANCE WITH HEALTH CANADA'S FRONT-OF-PACK NUTRITION LABELLING POLICY

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BACKGROUND AND OBJECTIVES

Globally, unhealthy diets are major preventable risk factors for non-communicable diseases, costing billions to the healthcare system. Despite initiatives, diet quality remains poor in Canada. The World Health Organization recognizes Front-of-Package Nutrition Labelling (FOP) as effective policies to promote healthy diets, reformulate foods and reduce disease risk. Health Canada FOP policy mandates "High-In" symbols when foods exceeding thresholds for saturated fat, sugar and sodium (SFSS). However, the benefits of such policies remain unclear. This study evaluates the impact of non-compliance with Health Canada's FOP policy on diet quality and 5-year all-cause hospital occupancy risk at the national level.

METHODS

Data from the Canadian Community Health Survey-Nutrition 2004 linked with individual-level health administrative databases (2004-2014) were analyzed. Dietary intake data from repeated 24-hr recalls were used to measure compliance, defined as the usual proportion of energy consumed from 'High-In' labelled foods with (FOP-ECI) and without (FOP-ECISENS) policy-exempt foods. The number of high-in labels (mCAN-FOP DI) and a reference dietary pattern (DASH) were also used in sensitivity testing. Weighted multivariable zero-inflated negative binomial models estimated relative risk hospitalization across compliance group quintiles.

RESULTS

Of 2839 unique foods reported by Canadian adults (>20yrs), 33% required ≥ 1 FOP symbol. FOP-ECI showed high, moderate and low agreements with mCAN-FOP DI(k=0.83), FOP-ECISENS(k=0.48), and DASH(k=0.13), respectively. Individuals in the low compliance group (Q5) compared to those compliant (Q5) for FOP-ECI, had lower fruit, vegetable intake, and higher energy consumed from SFSS and fast food. Those in the low compliance group, compared to high, for FOP-ECI had 52% higher risk of hospital bed-days (RR:1.52; 90%CI: 1.50-2.19); sex-stratified analyses and FOP-ECISENS models did not reach statistical significance.

CONCLUSIONS

Non-compliance with FOP policy was associated with lower diet quality and was positively associated with hospital risk; sensitivity analyses call for larger studies to confirm RESULTS. This evidence provides a new line of inquiry to support future implementation and refinement of FOP policies globally to improve diet quality and healthcare outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 04 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

SOAP04_01

ENVIRONMENTAL IMPACT AND NUTRITIONAL QUALITY OF ADULT DIETS IN FRANCE BASED ON FRUIT AND VEGETABLE INTAKES

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BACKGROUND AND OBJECTIVES

Sustainable diets, as defined by the FAO, must include more fruits and vegetables (FV) than current diets. This study assesses the nutritional quality and environmental impacts of adults' diets in France based on their FV consumption levels.

METHODS

Estimates of dietary and nutritional intakes are derived from the French INCA3 dietary survey (2014-2015). The population (n=2,121 adults) was divided into quintiles of FV intake (g/day), with Q1 representing the lowest intake. The nutritional quality of diets was assessed using four indicators : average adequacy to recommendations for favored nutrients (MAR), solid energy density, average excess intake of nutrients to limit (MER), and adherence score to the National Nutrition Health Program (PNNS-GS2). The environmental impacts of diets were estimated using the environmental footprint score (weighted average of 16 indicators) and 4 indicators considered individually (climate change, ozone depletion, fine particulate matter, and blue water, referred to here as water use). The analysis was conducted on individual diets adjusted to 2000 kcal.

RESULTS

FV consumption ranged from 119 g/day (Q1) to 694 g/day (Q5) on average. Q5 was characterized by a higher energy density. Adjusted to 2000 kcal, the solid energy density, MAR and PNNS-GS2 indicators were better in Q5 than in Q1. The densities of vitamin C, B9, potassium, and fiber were especially higher, and those of free sugars were lower. Increased FV consumption was associated with a lower impact on climate change, fine particulate matter, and ozone depletion, but a higher impact on water use. No significant differences were observed between quintiles for the environmental footprint score.

CONCLUSIONS

Higher FV consumption is associated with better nutritional quality of diets and lower environmental impacts, except for water use. Thus, it appears essential to increase the proportion of FV in diets to increase the nutritional quality and to reduce the environmental impacts of food. The impact on water use could be mitigated by optimizing upstream agricultural practices rather than reducing FV consumption.

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SOAP04_04

FROM PLATE TO POLICY: UNDERSTANDING FOOD CHOICES AND BEHAVIOURS FOR HEALTHY AND SUSTAINABLE DIETS IN OLDER ADULTS

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BACKGROUND AND OBJECTIVES

There is a need to understand consumers' food practices and how to encourage a shift towards healthier, sustainable diets(1). This qualitative study aimed to develop the Department for Environment, Food and Rural Affairs'(Defra) understanding of older people's food choices, attitudes, and behaviours, in relation to dietary trends, sustainability, health, and accessing food, under a programme to understand the sociodemographic differences in food practices and to support evidence-informed policymaking.

METHODS

Semi-structured interviews were carried out with two sets of stakeholders: (i) older people and (ii) organisations providing food and/or dietary advice to older people. Approval for the study and data storage approach was granted by the Defra Data Protection team. Purposive sampling was used to select 12 adults aged 65+ to participate, (n=3 men; n=9 women; white n=9, black n=2, other n=1), and mean age: female 73 years (range 65-83); men 78 years (range 76-79). Those selected were rural (n=3), urban dwelling (n=9), living independently in England, and included single (n=8) and married people (n=4). Organisation interviews (n=12) involved staff from a national food pantry program, two social housing providers, a regional food access charity, and a national ageing support and advisory group.

RESULTS

Barriers to healthy, sustainable diets dominated the five themes that emerged from the analysis of interviews with organisations and older people; physiological changes (lower appetite, declining physical function, chronic illness); social changes (impact of eating alone); access and availability (transport limitations, the shopping environment and selection of foods); skills and capabilities (use of convenience food, ability to prepare and cook food); healthy diet and sustainability (openness to changing diets, opportunities and barriers to dietary change). Adapting to physiological changes impacted food choice, since people were less able to consume habitual foods. The social change of eating alone showed frequent loss of interest in meals and diet quality, and capabilities and skills highlighted the challenges faced by those whose former partner had prepared their meals. Beliefs on healthy and sustainable diets and sources of advice varied, as did the ways in which the participants' eating habits changed. There was a general preference for natural and less processed foods.

CONCLUSIONS

Physiological and social factors are more prevalent in later life and impact food choices, behaviours and ability to access healthy and sustainable diets amongst older people.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP04_05

GENDER-JUST TRANSITION TO REDUCED COMMERCIAL MILK FORMULA USE AND GREENHOUSE GAS EMISSIONS IN FACILITIES PROVIDING MATERNITY AND NEWBORN CARE SERVICES: A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES

The use of commercial milk formula (CMF) in maternity services disrupts successful establishment of breastfeeding and adds to greenhouse gas (GHG) emissions. We identified evidence on GHG emissions in maternity services and explored implications for a gender-just transition to lower carbon footprints by a scale-up of the WHO/UNICEF Baby-Friendly Hospital Initiative (BFHI) to reduce CMF use.

METHODS

We performed a scoping review and narrative synthesis on three interrelated topics: 1) the GHG emissions impact of CMF use in maternity and newborn care services, 2) gender-just transitions in food and agriculture systems away from dairy, and 3) the influence of implementing BFHI on CMF use at hospital discharge

RESULTS

Searches retrieved 280 articles across three topics, with 51 meeting inclusion criteria. For topic 1, there was limited focus on the GHG impacts of paediatric and obstetric practices or CMF use, with just one study assessing the impacts of CMF use for hospital food waste. Topic 2 included 14 studies showing that gender disparities and structural inequalities hinder effective gender mainstreaming and climate change adaptation in agriculture such as dairying, while none cited any gendered effects on producers of reducing dairy use from transition to more sustainable health services. For topic 3, 36 studies indicated that hospital practices and policies supporting breastfeeding, like BFHI, significantly lowered use of CMF or increased exclusive breastfeeding, while enhancing the likelihood of investment in adequate education and training of maternity and newborn care staff in breastfeeding support. Conversely, practices like delayed initiation of breastfeeding, CMF supplementation, pacifier use and insufficient staff training and education on breastfeeding management are associated with more CMF use.

CONCLUSIONS

This study highlights a significant gap in the literature about the carbon footprint of facilities providing maternity and newborn services. Given the substantial GHG emissions associated with CMF, absence of evidence of harmful impacts on female dairy farmers, and under-investment in women's skills as maternity care professionals, health systems seeking to reduce their carbon footprint should implement gender-just strategies such as BFHI which minimize unnecessary CMF use in maternity services and increase investments in training and education of mostly female maternal and newborn care services staff.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP04_06

THE SUITABILITY OF VEGETARIANISM FOR ELDERLY POPULATIONS: EVALUATION OF THE IMPACT OF A VEGETARIAN MEAL ON PLANT PROTEIN ASSIMILATION IN RATS OF ALL AGES

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BACKGROUND AND OBJECTIVES

The rise of plant-based diets raises questions about their suitability for populations with specific needs, such as the elderly. As plant proteins are known to be less digestible than animal proteins, there is a risk that the protein requirements of this population will not be met. This study then aimed to assess the impact of a vegetarian meal on protein synthesis, digestibility and postprandial distribution of a plant protein in rats of all ages.

METHODS

48 male Wistar rats of 1, 10 and 18 months (n=16/age group) ingested either an omnivorous meal (OMNI, n=8/group) or a vegetarian meal (VEGE, n= 8/group) to which intrinsically 15N-labeled cooked and dehulled peas were added in order to specifically follow their digestive and metabolic fate. Both meals had similar macronutrient contents (22%P/E, 70%G/E, 8%L/E) and the vegetarian meal was higher in fiber and antinutritional factors. These meals represented about 20% of the daily energy intake, with the remaining 80% provided by a standard diet. Body weight and food intake were measured daily. Digestive contents were collected 6h after meal intake to measure protein digestibility. Urine, plasma, organ and tissue samples were also collected to analyze deamination and postprandial distribution of dietary nitrogen. 30 minutes before euthanasia, 13C-valine was injected intravenously to enable analysis of protein synthesis in liver and muscle.

RESULTS

With age, a decrease in body weight gain ($P<0.0001$), food intake ($P<0.05$), liver ($P<0.0001$) and gastrocnemius muscle ($P<0.0001$) weight relatively to the body weight was observed, without any meal type effect. The VEGE group showed a lower indispensable amino acids (IAAs, $P<0.01$) and branched chain amino acids (BCAAs, $P<0.0001$) digestibility compared to the OMNI group, without any age effect. Deamination ($P<0.0001$) was increased with age, as well as the postprandial nitrogen distribution in the liver ($P<0.05$), plasma proteins ($P<0.0001$) and gastrocnemius muscle ($P<0.01$), without any meal type effect.

CONCLUSIONS

Our RESULTS show a decrease in gastrocnemius muscle weight as well as an increase in dietary nitrogen distribution and deamination with age, as described in the literature. However, the vegetarian meal reduced the digestibility of IAAs, notably BCAAs, the latter being essential for stimulating muscle protein synthesis. A prolonged consumption of this diet could therefore increase the risk of sarcopenia in the elderly. Additional long-term studies are needed to evaluate this hypothesis.

CONFLICTS OF INTERESTS

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SOAP04_07

ASSESSING BIODIVERSITY IMPACTS OF DIETS AND FOOD SYSTEMS

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BACKGROUND AND OBJECTIVES
Currently prevalent Western diets are central drivers of biodiversity loss through their contribution to land use change, ecotoxicity, climate change and water consumption caused by unsustainable, intensive and livestock-heavy agricultural production (1, 2). However, assessing the impacts of diets and food systems on biodiversity remains challenging due to the heterogeneity and the intrinsic complexity of biodiversity, which encompasses different scales, time dynamics and diverse dimensions such as species, genetic, and functional diversity. Studies including various impact categories are relatively rare, highlighting the need for robust assessment METHODSat the food system level.
METHODS

An established mass- and nutrient-flow food system model (3, 4) is used to evaluate environmental impacts of diets and associated agri-food systems (e.g. land use, water use, GHG emissions, nitrogen surplus, etc.). To integrate the impacts of diets on biodiversity, this model is combined with life cycle impact assessment (LCIA) indicators developed by the UNEP life cycle initiative (5). These indicators translate the environmental impacts coming from the model into potential biodiversity outcomes, such as eutrophication effects from fertilizer use. Using Switzerland as a case study, more sustainable production scenarios (organic, grass-based, circular) are evaluated regarding their ability to feed the population and performance in various biodiversity related impact categories compared to the current consumption (6) and Swiss dietary recommendations (7).

RESULTS

Combining a food system model with LCIA indicators enables the evaluation of diets and production systems in terms of their impacts on biodiversity and other environmental categories. The application of this method on Switzerland as a case study reveals synergies and trade-offs between impact categories. Importantly, this analysis shows, how far LCIA-biodiversity indicators can be used to assess biodiversity on the rather aggregate level of food system and dietary scenarios. It allows to address related challenges, that e.g. arise from the neglect of aspects like habitat structure or genetic and functional biodiversity.

CONCLUSIONS
The integration of LCIA indicators with a food system model facilitates the assessment of agricultural production and dietary impacts across multiple categories relevant to biodiversity. Nonetheless, careful interpretation of the RESULTS is essential, given the limitations in scope, and transparent communication regarding the method's capabilities and constraints is crucial.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP04_08

DOES DEFORESTATION INFLUENCE BEEF RETAIL PRICES IN BRAZIL?

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BACKGROUND AND OBJECTIVES

Conversion of forests to pasture accounts for 40% of forest loss worldwide (1), notably in Brazil, where the expansion of livestock grazing is the major driver of deforestation (2). Deforestation control efforts confront a purported trade-off between forest conservation and agricultural production. The supposition is that limiting agricultural expansion implies the need for systems intensification, leading to increased production costs, higher consumer prices, and potential food insecurity. We use supply chain data for 2,980 beef products sold in Brazilian retail stores and deforestation data at the municipal level to evaluate the causality between deforestation control and consumer prices.

METHODS

A directed acyclical graph was used to inform the model specification and interpretation of the findings. The influence of deforestation on retail prices was estimated using a fixed-effects model, with retail store neighbourhoods as fixed effects. The deforestation exposure (ha/kt) of beef products was calculated from supply chain data on the deforestation rates in municipalities of product origin (3). The model included the following co-variables: sanitary inspection level (federal or state); product type (premium, non-premium, offal, processed); distance between meatpacker and retail store (km); supply chain monitoring (yes/no); retail store size (top 10, top 900, smaller stores). Standard errors clustered at the retail store neighbourhood were applied to derive 95% confidence intervals. The analysis plan has been detailed in a pre-registration platform (4).

RESULTS

Data was collected from retailers in five states: Acre (35%), Mato Grosso do Sul (4%), Pernambuco (28%), Santa Catarina (9%), and São Paulo (24%). The median price per kg was USD 5.63 (IQR 3.98; 7.96), with median deforestation exposure at 577 ha/kt (IQR 57; 1,613). Although products from the Legal Amazon were USD 1.66 cheaper, deforestation exposure where beef products originated did not affect prices. The main determinant of price was inspection level, with products inspected at the state level being 1.45 USD/kg cheaper (95% CI 3.18; 14.38) than federally inspected ones.

CONCLUSIONS

Our findings indicate that (i) deforestation in the sourcing area does not influence beef retail prices; (ii) more rigorous sanitary inspection is associated with higher prices. This work contributes to the debate about the potential unintended consequences of deforestation control policies. Furthermore, it offers evidence to support Brazil's mitigation and adaptation plans set out as part of its Nationally Determined Contributions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP04_10

CRITICAL REVIEW OF THE RELATIONSHIPS BETWEEN BIODIVERSITY AND DIETS: CURRENT STATUS AND POTENTIAL OPPORTUNITIES FOR ITS ASSESSMENT

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BACKGROUND AND OBJECTIVES

As biodiversity loss dramatically affects food systems and their ability to deliver healthy diets for all, there is an increasingly urgent need to understand the multifaceted links between biodiversity and the core principles of healthy diets: adequate, balanced, moderate and diverse. While it is clear that healthy diets cannot be achieved without biodiversity, this relation is informal and rarely quantified. The aim of this study is to assess the current evidence on the contribution of biodiversity to healthy diets, by considering all four principles and not only diversity. Ultimately, the study will explore how measures of these relationships can be better harmonized to inform policies and programmes.

METHODS

We conducted an exploratory literature in accordance with the PRISMA guidelines, aiming to analyse studies that measured relationships between biodiversity and diets at household or individual levels. Studies for inclusion were identified through English-language keyword searches in the Web of Science, focusing on studies published after 2010 to capture recent advancements in this area. Particular attention was given to studies that not only looked at dietary diversity but also explored the role of biodiversity in promoting nutrient adequacy, moderate consumption of certain food groups, and achieving balanced diets.

RESULTS

Although widely discussed and acknowledged, the evidence reveals a significant knowledge gap regarding the links between biodiversity and diets. Most studies fail to quantify or comprehensively assess how changes in biodiversity—whether increases or declines—impact household and individual diets and vice versa. While some positive associations have been observed, others have not, underscoring the urgent need to explore these linkages more thoroughly. Notably, increasing biodiversity does not universally lead to improvements across all principles of healthy diets. In high income countries, a growing body of literature has focused on how dietary patterns affect biodiversity. The variety of parameters used to define biodiversity and diets hinders meaningful comparisons and insights in better understanding the relationships.

CONCLUSIONS

Overall, for a subject that seems straightforward, studies do not agree on the relationships between biodiversity and diets. Articulating these links and highlighting existing gaps in the literature is essential to better understand and analyse the multifaceted role of biodiversity in supporting healthy diets and vice versa. This understanding is critical to advancing evidence-based strategies for the conservation of biodiversity for better nutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP04_11

SYNERGIES IN DIETARY CONSTRUCTS - OPTIMIZING FOOD BIODIVERSITY, NUTRIENT ADEQUACY, AND ENVIRONMENTAL SUSTAINABILITY

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BACKGROUND AND OBJECTIVES

Diets low in dietary species richness (DSR), high in animal source and ultra-processed foods (UPFs), are characterized by poor nutritional quality and increased environmental impacts (1). Improving diets often requires balancing health and environmental goals, which can be challenging (1,2). This study examined whether diets, incorporating food biodiversity, food processing, and adherence to the EAT-Lancet reference diet, could be optimized to enhance nutrient adequacy while reducing environmental impacts.

METHODS

Greenhouse gas emissions (GHGe; kg CO2-eq/kg food/day), land use (m^2/kg food/day), and nutrient adequacy (Probability of Adequate Nutrient Intake Diet, PANDiet score) were, in turn, related to dietary indices expressing, DSR, disaggregated into DSRPlant and DSRAnimal, food processing (using the Nova classification), and adherence to sustainable diets (using the EAT-Lancet Healthy Reference Diet, HRD, range: 0-140). Multivariable linear models, including interaction terms between dietary indices were applied to data from 368,733 adults in the European Prospective Investigation into Cancer and Nutrition.

In addition, multi-objective optimization (MOO) was used to evaluate trade-offs between environmental outcomes and nutrient adequacy. Optimal combinations of dietary indices were identified to minimize GHGe and land use while maximizing PANDiet and DSR, and participants were aligned with these optimal solutions to assess potential improvements.

RESULTS

The three dietary indices were weakly to moderately correlated (Spearman's ρ: -0.22 to 0.42). MOO identified optimal solutions characterized by a mean (SD) increase of 13.9 points (13.5) in the HRD score, a 1.4 species (4.9) increase in DSRPlant, a small reduction of 0.1 species (1.9) in DSRAnimal, and a 12.4 % (12.5) substitution of UPFs with unprocessed or minimally processed foods. These solutions led to a mean (SD) increase of 4.12 percentage points (6.70) in PANDiet score, a 5.6% (19.3) increment in DSR, a 14.2% (28.0) decrease in GHGe, and a 12.8% (31.4) reduction in land use.

CONCLUSIONS

Diets that promote food biodiversity, prioritize unprocessed and minimally processed foods over UPFs, and adhere to the HRD have the potential to enhance nutrient adequacy while minimizing their impact on the environment.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP04_13

UNDERSTANDING THE INTERPLAY BETWEEN GREENHOUSE GAS EMISSIONS, HEALTH, AND COST OF FOOD AND DRINK: A PRELIMINARY ANALYSIS OF LOYALTY CARD DATA FROM A LARGE UK FOOD RETAILER

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BACKGROUND AND OBJECTIVES

The food system is the second biggest contributor to greenhouse gasses globally after the energy industry [1]. Diet-related ill-health costs the UK £268 billion/year [2]. There is a lack of evidence that links these issues, including how sustainable and healthy food purchases vary across the population, due to limited data availability. Transaction data from food retailers is a relatively untapped resource that could evaluate this.

METHODS

We used loyalty card data from a major UK supermarket on >160 million purchases made in 2022 in Yorkshire and the Humber (Y&H). Data included product description, retailer product categorisations, and High in Fat Salt and Sugar (HFSS) status [3] alongside de-identified customer profiles, allowing household purchase estimates. Products were mapped to one of 77 categories based on the Living Costs and Food Survey (LCFS) categories [4]. Published data on global average mean greenhouse gas emissions (GHGE) for 43 food commodities [5] were used to estimate GHGE for each product, based on the LCFS category, retailer categorisations, and product descriptions. Multilevel regression with post-stratification was used to adjust estimates for selection bias in the sample across card-holder age, neighbourhood deprivation, area of residence and household size. For funding see ref [6].

RESULTS

Ten food categories contributed 75.8% of total estimated GHGE by sales volume. The top three contributors were beef, milk and cheese (19.6%, 9.8% and 8.6% respectively). Foods categorised as HFSS had higher median GHGE and higher cost than non-HFSS foods (GHGE: 0.32 vs 0.21 kg CO2 equivalent per 100g; cost: 83p vs 48p per 100g). In the multilevel model, we found an inverted-U-shaped relationship between loyalty card holder's age, and estimated emissions, with those in the 45-54 age category having the highest estimated GHGE. The opposite relationship was found between age and HFSS purchases, with those in the middle age groups being least likely to purchase HFSS foods. There was no correlation between area-level deprivation and GHGE, but a trend of association for those in areas of higher deprivation to purchase proportionally more HFSS foods.

CONCLUSIONS

We found that foods that are more sustainable tend to be non-HFSS and cheaper to purchase. Populations living in areas of high deprivation tend to buy more HFSS foods vs non-HFSS foods. There is a subset of foods that are healthy, sustainable and low-cost, which could be promoted to address health and the environment, but any such intervention may need to be targeted at a local level and/or to specific populations to be most effective.

CONFLICTS OF INTERESTS

Authors work in collaboration with major retailers but do not receive payment from them.

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SOAP04_15

HARMONISING STORAGE COMMUNICATIONS AND DATE LABELLING CONVENTIONS USED ON SOUTH AUSTRALIAN DAIRY PRODUCTS

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BACKGROUND AND OBJECTIVES

Better harmonisation of labelling information has been suggested as one way to reduce food waste. Fifty-eight percent of Australia's food waste comes from the retail, households and food service sectors. Dairy products such as milk, yoghurt and cheese wasted from these sectors contributes greatly to greenhouse gas emissions and landfill. Research suggests that confusion over statement of storage conditions (SSC), directions for use (DFU) and date marking (DM) on labels may be contributing to consumers discarding these products prematurely and generating food waste. To address this, a comprehensive understanding of current SSC, DFU and DM labelling conventions used on dairy products is needed. This study investigated SSC, DFU and DM labelling practices on selected milk and dairy products, identifying commonalities and inconsistencies, and compared with regulatory standards and industry advice.

METHODS

SSC, DFU and DM information were collected from real-labels of six dairy product categories: fresh milk (plain and flavoured), ultra-high temperature (UHT or long-life) milk (plain and flavoured), yoghurt and a sample of dairy desserts sold online (and a small sample of in-store products) across four leading supermarkets in South Australia. Label information was extracted and analysed to identify conventions, common practices and inconsistencies and compliance to regulatory standards.

RESULTS

Most labels were compliant with Australian labelling requirements. Strong conventions were identified in only a few labelling elements, for example, placing DFU after SSC, providing a usage timeframe suggestion for the product once opened, and DM choices for each dairy product category. Many variations exist in the location, formatting and provision of SSC, DFU and DM across the dairy product categories. Discordance was identified in many labelling elements.

CONCLUSIONS

While harmonisation was identified in some labelling elements, discordances exist in many more elements. Better harmonisation of labelling practices in these areas, combined with other strategies such as education programs may help the industry create labels with clearer, more consistent and easy-to-identify instructions regarding SSC, DFU and DM. This may reduce label-reading confusion, and support consumers in handling, storing and using the product, thereby reducing risk of food waste.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 10 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

SOAP10_02

RICE-BASED PRODUCTS FOR CLIMATE-FRIENDLY AND HEALTHIER FILIPINOS: FOOD-BASED SOLUTION TO ADDRESS MALNUTRITION IN CHILDREN AND ADULTS

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BACKGROUND AND OBJECTIVES

Malnutrition remains a significant challenge in the Philippines, with undernutrition disproportionately affecting vulnerable populations. Alarmingly, one in three Filipino children under five experiences stunting, ranking the country among the top five in East Asia and the Pacific for stunting prevalence. This condition impairs childhood development and perpetuates a cycle of poor health, limited economic productivity, and poverty. Thus, the need for complementary and food-based intervention. This work developed nutritious and healthy rice-based products for vulnerable population.

METHODS

Three rice-based products were developed to complement existing nutrition interventions while promoting climate-friendly practices. First, complementary food premixes for older infants were formulated. Second, yogurt drinks, enhanced with fermented rice bran (FRB) from pigmented Philippine rice cultivars. Lastly, choco-flavored rice malt-soy milk beverages for pre-school and school children. All products were subjected to sensory evaluation using target consumers, chemical and nutritional analyses, and shelf life testing.

RESULTS

Optimized blend of rice, soybean, and yellow sweet potato flours for infant food premix composed of 50 to 52.50 per cent rice, 32.50 to 35 per cent soybean, and 15 per cent yellow sweet potato flour, met the standard requirements for complementary foods. The blend provides a practical and healthier food choice, particularly for infants in poor households with inadequate access to food supplies. Yogurt drink was developed with fermented rice bran using pigmented Philippine rice cultivars (Red Dinorado and Black Ominio). The black yogurt drink has higher phytochemical and antioxidant properties, while the red yogurt drink is a rich source of dietary fiber. Both variants are nutrient-dense, containing probiotics and other health-promoting properties, with a shelf life of 17 days under refrigerated conditions. Choco-flavored rice malt-soy milk beverages formulated from suitable Philippine rice varieties most accepted ratio of 7:3 rice-to-soy provides sensory quality comparable to commercially available products. The beverage is highly appealing to children aged 3 to 12 and, when unopened and stored in High Density PolyEthelene bottle containers, remains stable for 20 days under refrigerated conditions.

CONCLUSIONS

These products not only deliver enhanced nutrition but were also produced using locally-grown crops and by-products that will complement existing interventions for climate-resilient population and sustainable food system.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP10_03

ASSOCIATIONS BETWEEN DIET-RELATED GREENHOUSE GAS EMISSIONS AND NUTRIENT INTAKE ADEQUACY AMONG JAPANESE SCHOOL-AGED CHILDREN: CROSS-SECTIONAL ANALYSIS

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BACKGROUND AND OBJECTIVES

A growing number of studies investigated sustainable and healthy dietary patterns. However, a few studies targeted children, who have different nutritional needs from adults. This study aimed to examine associations between diet-related greenhouse gas emissions (GHGE) and the prevalence of inadequate nutrition intake among Japanese school-aged children.

METHODS

Diet records were analysed on three non-consecutive days among 915 healthy Japanese school-aged children (8-14 years). Diet-related GHGE was estimated using the Inventory Database for Environmental Analysis and adjusted for energy intake using the density method. Prevalence of inadequacy was defined as a percentage of participants with nutrient intake outside or below the reference value defined by the Dietary Reference Intakes (DRIs) 2025 for Japanese. The association between diet-related GHGE and intake amount of food and nutrients were examined by regression analysis. Further, logistic regression was used to examine the prevalence of inadequate nutrient intake according to quartiles of diet-related GHGE.

RESULTS

Intake amounts were positively associated with diet-related GHGE for total vegetables, fish and seafood, meat, dairy products, protein, total fat, saturated fat, thiamin, riboflavin, niacin, vitamin B6, magnesium, iron, sodium, and potassium. With an increasing quartile of diet-related GHGE, the prevalence of inadequacy decreased for protein, riboflavin, niacin, vitamin B6, iron, and potassium, while that increased for macronutrient balance regarding carbohydrate, total fat, and saturated fat.

CONCLUSIONS

Japanese children with higher diet-related GHGE had worse adherence to the DRIs for macronutrient balance but better adherence to some vitamins and minerals, probably due to higher intake of animal-based foods. Switching to low-fat and environmentally friendly animal-based foods would be required to reduce diet-related GHGE and improve nutrient intake adequacy among children.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP10_04

UMAMI PROGRAM DEVELOPMENT AND RESEARCH PROTOCOL: A TRANSDISCIPLINARY APPROACH TO PRIMARY SCHOOL FOOD EDUCATION

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BACKGROUND AND OBJECTIVES

Healthy and sustainable eating behaviors are crucial for population and planetary health. Primary schools offer a key setting for educating children about food, nutrition, and sustainability, yet the Swiss primary school curriculum lacks evidence-based nutrition education. This study aims to evaluate the impact of the Umami project, a sensory food and nutrition education program developed through co-design and participatory approaches, on improving knowledge, intention, attitude, and neophobia toward healthy and sustainable eating among teachers, school children, and parents.

METHODS

The Umami project employed a trans-disciplinary approach involving experts to identify 80 food system concepts, grouped into 8 themes: food origin, informed consumerism, food waste, food culture, dietary guidelines, intuitive eating, culinary practices, and planetary health. Teachers, specialists, and 22 school children (aged 9–10) co-designed educational materials. For the pilot study, a pre-post evaluation design will be implemented, recruiting 32 primary school classes from German- and French-speaking Swiss cantons using convenience sampling. Teachers will receive training, Umami teaching materials, a digital platform, and extracurricular activity guides for parents. The program will be delivered over 9 months (school year 2026–27). Baseline and post-intervention measurements will assess knowledge, intention, attitude, and neophobia. Paired t-tests will compare pre- and post-program outcomes, while independent t-tests will evaluate differences across cantons and socio-demographic areas. Program satisfaction will be explored through qualitative analysis.

RESULTS

This pilot study will identify areas for refining program delivery and content, including pedagogical sequences, materials, and the online platform. Assessing outcomes by canton and socio-demographic factors will enable program tailoring to diverse needs. Findings will inform program improvements for possible national implementation.

CONCLUSIONS

This study will enhance understanding of how trans-disciplinary, practical education can improve knowledge and attitudes toward sustainable, healthy eating. Refinements will ensure the program's relevance, scalability, and success in diverse educational contexts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP10_05

RECONCILING SUSTAINABILITY AND SOVEREIGNTY? THERE IS NO RELATIONSHIP BETWEEN NUTRITIONAL QUALITY, ENVIRONMENTAL IMPACT AND FOOD SOVEREIGNTY IN FRENCH DIETARY PATTERN

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BACKGROUND AND OBJECTIVES

The capacity to provide sustainable diets, covering nutrient requirements, reducing risk of chronic diseases and having a low impact on the environment, depends on domestic agricultural production and agricultural commodity trade flows. The transition to more sustainable food systems is therefore closely linked to food sovereignty issues. This study aimed to analyze the nature of the relationships among the nutritional, environmental and food sovereignty dimensions from food groups consumed in France.

METHODS

Three indicators related to the three dimensions were calculated for each food (n=1772) from the French representative survey of adults' food consumption INCA3 (n=2121). First, we developed a nutrient-based food scoring system (PANFood, inspired by the PANDiet system) to assess nutritional quality based on the potential to provide sufficient indispensable nutrients without excessive nutrients to limit (n=32), using the CIQUAL database. Second, environmental impact was estimated using the single Environmental Footprint (EF) score from the Agribalyse database. Third, food sovereignty was estimated as the food self-sufficiency (FSS) capacity, calculated as the ratio of domestic production to food availability using international (FAOSTAT) and national databases. Finally, these indicators were calculated for each food group as the consumption-weighted average of the food indicators to analyze their distribution across the dimensions. The long-term health value of food categories, as outlined in the Global Burden of Disease study, was also considered.

RESULTS

Overall, self-sufficiency showed no correlation with the nutritional and environmental dimensions (all $R^2<0.01$), and the indicators exhibited substantial heterogeneity within food groups. Nevertheless, certain patterns were observed. The cereals and tubers achieved high scores across all indicators. Fruits, vegetables, and legumes showed good nutritional quality, low cardiovascular disease risk, and low environmental impact, but self-sufficiency varied widely, especially within the fruits (e.g., low for citrus and high for apples). France was nearly self-sufficient in red and processed meats (with varying FSS capacity, from low for lamb to adequate for chicken), which were nutrient-dense but also associated with higher cardiovascular disease risk and high environmental impact.

CONCLUSIONS

In France, based on the current dietary pattern, food sovereignty does not align with these sustainability dimensions. However, certain food groups can serve as lever to enhance sovereignty. These data could be used to model more sustainable and self-sufficient diets.

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SOAP10_06

FEMALE-HEADED-HOUSEHOLDS COPING STRATEGIES TO CLIMATE INDUCED FOOD SHORTAGES

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BACKGROUND AND OBJECTIVES

Globally, climate change impacts are gradually changing the availability, quality, affordability, and accessibility of food. South Africa's mitigation of food insecurity will depend on the understanding of the nation's risks and vulnerabilities. In 2023, 42.3% of households in South Africa were female-headed and known to suffer multiple burdens of earning less, being heavily depended upon by others and inhabiting both breadwinner and domestic roles (1). Climate change impacts are known to aggravate gender inequality. Through understanding the choice of coping strategy to food insecurity, prediction of the sustainability and feasibility of the female-headed-household to secure food should environmental shocks occur, is critical. The objective of the study was to explore coping strategies to lessen the burden of food inaccessibility, unavailability, and instability; and how sociodemographic factors impact choice of coping strategies towards lessening the burden of food shortages.

METHODS

A descriptive phenomenological qualitative design with 25 participants, face-to-face in-depth-interviews was employed. Each interview was transcribed, and data analysed using *ATLAS.ti.* Through inductive thematic analysis the data was categorised into themes and sub-themes.

RESULTS

Twenty-four participants adopted coping strategies to food shortages which were categorised as:action-oriented, self-sacrificing, emotional or passive. The sociodemographic profile influenced choice of coping strategies. The RESULTS concur with previous work suggesting that food access is an important factor in addressing food insecurity. Sen's-theory of entitlement, asserts that food access is directly related to a resource pool, be it money or other trade commodities, which improve purchasing power. The RESULTS exhibited a pervasiveness of food shortages within female-headed homes and further, that coping strategies to deal with these shortages were commonly adopted.Implementation of coping strategies was contingent upon the participants' age, education, employment, marital status and household income and size.

CONCLUSIONS

Without the voices of female-household-heads, implementation, monitoring and evaluation of policies would be ineffective as they are not sovereign. To proactively deal with imminent climate change threats and consistent food insecurity worries, the study reveals the necessity to include the voices of urban female-household-heads when implementing strategies and policies to improve their access and protection of resources.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP10_07

SUSTAINABLE NUTRITION FOR OLDER ADULTS WITH OBESITY: DEVELOPMENT OF RECIPE BOOKS IN THE 2EAT PROJECT

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BACKGROUND AND OBJECTIVES

The number of older adults with obesity increases and the protein transition requires more plant-based diets. Dieticians doubt whether a more plant-based diet meets the nutritional needs of this target group. Do they consume adequate amounts of high quality proteins to maintain muscle mass during a weight-loss diet with more plant-based protein? The objective of the first phase of this 2EAT project is to develop a more plant-based recipe book (60% plant proteins instead of 40%) for older adults with obesity which is: energy restricted, protein optimized, meets nutritional needs, and is appealing for the target group.

METHODS

Based on a first version of a more plant-based recipe book with 5 breakfast options, 10 lunch options and 20 diner options, we conducted three iterations of qualitative research. In each iteration, the daily nutritional value and ecological footprint of the recipe book were calculated by accumulating the average values for breakfast, lunch, and dinner. Iteration 1: Six focus groups were conducted to optimize the first version of the recipe book. Iteration 2: a cooking-at-home study was conducted in which 18 older participants bought, prepared and tasted at least 7 meals from the concept recipe book, a second optimization was performed based on insights from this iteration. Iteration 3: The concept recipe book was tested in a pilot study in which 11 participants received the recipe book at home for 8 weeks. Short interviews were held to make final adjustments.

RESULTS

In the first 2 iterations, it was challenging to meet nutritional criteria for protein (≥ 1.2 g/kg body weight), vitamin B2, B6, and calcium according to Dutch dietary guidelines, especially for females. Subjects were unfamiliar with ingredients like tempeh or tofu, reducing their willingness to try the recipes. Some recipes were too large or needed improved taste. After adjustments, subjects in iteration 3 were satisfied with the recipe book, with only minor adaptations needed.

CONCLUSIONS

The recipe book that is developed is more plant-based (>60% protein), with a higher protein content and higher protein quality, lower in energy, meets other nutrient needs, and is appealing to the target group. Planetary boundaries for greenhouse gas emission however are still not met. In the next phase of the 2EAT project the recipe book, together with a dietetic treatment plan, is tested in an RCT to study the effects on muscle health and overall health in a population of 55+ years old with obesity.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP10_08

CURRENT HOUSEHOLD PRACTICES FOR PRESERVING INDIGENOUS VEGETABLES: A CROSS-SECTIONAL STUDY TO ADDRESS CLIMATE CHANGE AND ENHANCE GLOBAL HEALTH

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BACKGROUND AND OBJECTIVES

Indigenous vegetables are nutrient-dense foods, essential for local diets, providing a range of nutrients vital for improving global health outcomes. Limited knowledge about their preservation and food composition under changing climatic conditions poses a barrier to their widespread use. The primary objective of this research is to assess and document the preservation METHODSemployed by households, whilst identifying factors influencing preservation choices and the impact of these METHODSon the nutritional quality and sustainability of indigenous vegetables, in the context of climate change.

METHODS

A cross-sectional survey was conducted with 308 households. Data were collected through structured interviews, focusing on types of indigenous vegetables consumed, preservation METHODSused, and factors influencing these practices. The study assessed the impact preservation METHODShave on nutrient retention and composition of the vegetables. Descriptive statistics and thematic analysis were applied to evaluate patterns and determine key influences on food preservation choices.

RESULTS

Sixty two percent reported that consumption of indigenous vegetables is common practice in their area and that preservation was important to ensure availability of the indigenous vegetables during the dry season. Frequently reported preservation METHODSwere sun-drying (86%). Drying was particularly valued for its low cost, minimal environmental impact, and ability to retain key nutrients like vitamins A and C. Socio-economic factors influenced preservation practices.

CONCLUSIONS

This research highlights the importance of promoting sustainable preservation METHODSfor indigenous vegetables. These METHODScontribute to climate resilient food systems, as well as ensuring year-round availability but also enhance food composition, contributing to improved nutrition and food security in the face of climate change.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP10_09

DIETARY PATTERNS OF CHILDREN IN RURAL BURKINA FASO SHOW DIVERGENCE BETWEEN HEALTHINESS, AFFORDABILITY AND SUSTAINABILITY OF THE DIET

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BACKGROUND AND OBJECTIVES

Diet-related risk factors are major contributors to the global burden of death and disease. In Burkina Faso, children typically consume low-quality diets, a situation exacerbated by poverty, growing pressure on land and water resources, and the global climate crisis. Our objective was to assess the relationship between dietary patterns, nutritional adequacy, cost, seasonality, and environmental sustainability in rural Burkinabe children.

METHODS

We conducted a secondary data analysis of four rounds of 24-hour dietary recall data of 1,080 children 2 to 8 years of age, and market surveys, collected during pre- and post-harvest seasons between 2017 and 2020. Reported food items were classified using the FAO/WHO Global Individual Food Consumption Tool (FAO/WHO GIFT) which can be matched to the Minimum Dietary Diversity for Women (MDD-W) classification. Data on the environmental footprint of foods (greenhouse gas (GHG) emissions, water use and land use) were extracted from the FAO/WHO GIFT open-access platform. Dietary patterns were generated through hierarchical clustering of principal components. Multivariate logistic regressions were used to assess how dietary patterns varied over time.

RESULTS

Four dietary patterns emerged differentiated by the main staple food consumed, including maize, rice, millet-sorghum, or a combo of beans and several cereals. Dietary diversity was low for all patterns (< 4 out of 10 MDD-W food groups). Staple foods were generally consumed with dark green leafy vegetables and other vegetables. The most frequently consumed maize-based pattern was the least nutritionally adequate (mean probability of adequacy across 11 micronutrients (MPA): 0.38). In contrast, the healthiest (MPA: 0.51) millet-sorghum-based pattern was consumed by poorer households. MPA was significantly positively correlated with GHG emissions (0.37) land use (0.27) and water use (0.45, all p-values <0.05). All diets had a similar cost ranging from $1.2 to $1.5 US dollar/child/day. Consuming any of the dietary patterns at a given round increased the probability of maintaining that pattern in the following rounds (odd ratios: 1.5 – 5.4, p-values <0.05), except for the combo diet which was more frequently consumed during the pre-harvest season, likely due to the low accessibilty of other cereals during this period.

CONCLUSIONS

Dietary patterns in rural Burkina Faso were all nutritionally suboptimal. The healthiest pattern was associated with a higher environmental footprint. Further research is needed to optimize diets in terms of healthiness, affordability, and sustainability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP10_10

SHIFTING PROTEIN RATIOS IN FOUR EUROPEAN COUNTRIES: DIETARY SUBSTITUTION MODELLING WITH PLANT AND ALTERNATIVE PROTEINS

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BACKGROUND AND OBJECTIVES

Transitioning diets towards more plant and alternative protein is essential for achieving environmental goals but may pose challenges for maintaining protein adequacy and improving overall nutritional quality in the population. This study aimed to evaluate the nutritional and environmental impacts of shifting dietary protein ratios by substituting meat and dairy products with analogues based on alternative protein sources – such as plants, insects, algae and microbial mass – in four European countries.

METHODS

Dietary intake data were obtained from nationally representative dietary surveys, based on two 24-h dietary recalls, of the adult population (18-64 years) in Finland (n = 1142), Germany (n = 10,071), Italy (n = 700) and Serbia (n = 1119). Starting from the observed diets, linear programming with a 1:1 substitution principle (on weight basis) was used to generate realistic dietary replacements that maintained existing meal structures. The model objective was to shift the average dietary protein ratios of animal to plant/alternative protein to 50:50 and 30:70 in each country, while minimizing the number of product substitutions. Diets were evaluated for protein adequacy (quantity and quality), overall nutritional adequacy, greenhouse gas emissions (GHGE) and land use (LU).

RESULTS

The number of substitutions varied slightly by country, with a median of 0.0-0.5 and 0.5-3.0 substitutions/day needed to achieve a 50:50 and 30:70 protein ratio, respectively. Meat products were more frequently substituted than dairy products. Despite the shift in protein ratios, median utilizable protein intake increased and remained well above the average requirement in all countries (> 122%). Fiber, vitamin E, folate, iron, magnesium and sodium intake increased and sugar, saturated fatty acids, EPA/DHA, vitamin B12, calcium and potassium intake decreased and were below requirements for some countries. The adverse impacts on vitamin B12 and calcium intake could be mitigated by fortification of analogues. GHGE and LU decreased with an average of 2-27% for the 50:50 ratio and 16-41% for the 30:70 ratio, with the smallest gains observed in Germany and the largest in Italy.

CONCLUSIONS

This study demonstrates that shifts in dietary protein ratios (up to 30:70) can be achieved through minimal and realistic dietary substitutions with plant and alternative protein analogues, and result in significant environmental gains. However, potential inadequacies of micronutrients primarily provided by animal products should be addressed by establishing fortification or reformulation targets for analogues.

CONFLICTS OF INTERESTS

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SOAP10_12

THE RESPECTIVE ROLES OF ANIMAL- AND PLANT-SOURCED FOODS FOR SUSTAINABLE LOWEST-COST NUTRIENT SECURITY IN DEVELOPING LOW- AND MIDDLE-INCOME COUNTRIES

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BACKGROUND AND OBJECTIVES

While the environmental dimension of sustainable healthy diets is well studied amidst climate change, the relationship between nutrition and diet affordability is often overlooked (1,2). With the rise in hunger, nutrient deficiencies, and food insecurity in developing low- and middle-income countries (2,3), the purchasing power to access nutrient dense foods is a key strategy to ease the burden of malnutrition (4,5). The study aimed to highlight animal- and plant-sourced foods that can supply essential nutrients at the lowest dietary cost in developing countries.

METHODS

Diet optimization models were developed to generate least-cost nutritionally adequate dietary patterns in Indonesia, the Philippines, United Republic of Tanzania, and Kenya. The Linear Programming approach used locally available retail food prices to identify the role of key food types in assisting to meet daily energy and nutrient needs of the adult population at the lowest dietary cost possible.

RESULTS

Modelled least-cost diets included a nutritionally balanced mixture of plant-based foods and animal-sourced foods, such as dairy milk, organ meats, eggs, fish, and seafood. The key essential nutrients that were provided at exactly their required intake levels, were mostly the vitamins, such as vitamin B-12, and minerals, particularly calcium, iron, and potassium. The daily cost of least-cost nutrient adequate dietary patterns varied below US $ 2.00, such as US $ 1.57 per day for Indonesia and US $ 0.75 per day for United Republic of Tanzania.

CONCLUSIONS

The respective economic roles of animal- and plant-sourced foods to deliver a baseline level of adequate nutrition at the lowest retail cost, need to be considered. This study offers valuable insights to improve diet quality, food security, and sustainable nutrition, in developing low- and middle-income countries.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP10_13

EDIBLE INSECTS IMPROVE LIPID METABOLISM: POSSIBLE COMPOUNDS AND MECHANISMS FROM A RAT STUDY

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BACKGROUND AND OBJECTIVES

To secure food resources in the face of a rapidly growing world population, there is a need to develop alternative and sustainable food and feed materials, and edible insects are recommended as one of the solutions. However, few insect species are officially recognized as edible in the EU and scientific information on the nutritional and functional properties of edible insects is limited. Considering the global use of recognized edible insects as functional food materials, the functionality, chemical compounds, and possible mechanisms should be clarified. We have reported that migratory locust (ML), a representative edible insect in the EU, contains omega-3 α-linolenic acid-bound phospholipids as well as triacylglycerols. Omega-3 lipids are expected to improve lipid metabolism, leading to the prevention and amelioration of lipid metabolic disorders. Therefore, we have investigated the effect of ML in diet on lipid metabolism, possible compounds, and possible mechanisms in rats.

METHODS

To clarify the lipid-soluble nutritional compounds in the ML, a comprehensive analysis was performed. In an animal study, plasma and liver of the male rats fed with a 10% ML containing normal diet for 5 weeks were used for the evaluation of the lipid metabolism.

RESULTS

The ML in the diet improved plasma and liver lipid metabolism via lipoprotein mechanisms. Plasma levels of low-density lipoprotein (LDL), particularly small-dense LDL, were suppressed and plasma and liver fatty acid profiles were shifted to be dominated by omega-3 fatty acids. Although eicosapentanoic acid (EPA) itself was not present in the ML, EPA would be synthesized and the levels in the plasma and liver were increased by the ML diet. Therefore, atherosclerosis indices and plasma mega-6/omega-3 ratio were improved by the ML. The presentative lipogenic indices, such as lipogenic mRNA expressions and enzymatic activities, in the liver were suppressed, and LDL lipid clearance indices were also improved by the ML. A comprehensive analysis of lipid-soluble compounds has revealed the binding modes of α-linolenic acid-bound phospholipids and neutral lipids. These functional lipids and the dietary fiber chitin in the ML may contribute to the improved effect on lipid metabolism.

CONCLUSIONS

The ML contains some functional compounds to improve lipid metabolism. As a possible mechanism for the lowering of plasma LDL lipids by the ML, it is expected that the uptake of LDL lipids into the liver was enhanced, and the lipogenesis and secretion of very-low-density lipoprotein lipids in the liver were additionally suppressed. ML can be a future food and feed resource with safety and functionality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP10_14

MINIMUM WASTE, MAXIMUM NUTRITION – EXPLORING FOOD WASTE ATTITUDES AND THE ACCEPTABILITY OF 'ROOT-TO-TIP' DINING AMONGST CONSUMERS IN A HIGHER EDUCATION INSTITUTION

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BACKGROUND AND OBJECTIVES

The development of 'root-to-tip' recipes in foodservice that incorporate more of the plant (i.e. peels and stalks) is being explored to improve suboptimal population intakes of fruit, vegetables and fibre [1], and reduce the climate impact of food waste [2]. However, given low peels and stalks consumption in the UK [3], the extent to which 'root-to-tip' meals may just shift food waste along the supply chain by increasing plate waste is unknown. The aim of this study is to understand the acceptability of 'root-to-tip' dining by exploring attitudes towards food waste and perceived barriers and enablers to eating peels and stalks.

METHODS

In person focus groups were conducted at a UK university with current employees. Convenience sampling was used to recruit between six to eight participants across three focus groups. A semi-structured topic guide with open-ended questions was developed to facilitate discussion. Discussions were audio recorded, transcribed verbatim and an inductive thematic analysis using NVivo software undertaken. The research protocol was approved by the King's College London Research Ethics Committee (Ref: MRA-24/25-46016).

RESULTS

Three focus group discussions were conducted with twenty participants (November to December 2024), primarily aged 26-45 years (80%) and female (80%). Six preliminary themes were identified: 1) perceived food waste causes and solutions; 2) growing food waste awareness and the intention behaviour gap; 3) the role of social modelling in 'root-to-tip' behaviours; 4) safety and edibility concerns around peels and stalks; 5) knowledge as a key facilitator for 'root-to-tip' adoption; and 6) the importance of sensory appeal. These themes illustrate a perceived growing consciousness of food waste and desire to reduce its associated negative consequences. However, RESULTS highlight structural, social and personal barriers which may contribute to an intention behaviour gap. Improving awareness of the safety and edibility of peels and stalks and practical knowledge related to their use may facilitate adoption of 'root-to-tip' behaviours. Ensuring the sensory appeal of 'root-to-tip' dishes is important to increase acceptability and prevent plate waste.

CONCLUSIONS

Our findings contribute to the understanding of attitudes towards food waste reduction practices at the preparation stage, in particular the use of peels and stalks, and highlight a need for increased knowledge to facilitate behaviour adoption. The next stage of this research will collect data from university students to inform the design of a behavioural intervention to introduce 'root-to-tip' dining within higher education foodservice.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP10_15

HOW THE OVER-EATING AFFECTS HUMAN AND PLANET HEALTH: THE ECOLOGICAL IMPACT AND THE METABOLIC FOOD WASTE OF OVERWEIGHT AND OBESE INDIVIDUALS

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BACKGROUND AND OBJECTIVES

Over-eating is one of the main drivers of obesity because of an Excess of Body Fat (EBF). This condition leads not only to human health issues, but also impacts the planet by wasting environmental resources used to produce the excess of food. Thus, the Metabolic Food Waste (MFW) index has been developed, calculated as the amount of food wasted for EBF accumulation and greenhouse gas (GHG) emissions, water and land used for its production. The present study aims at evaluating and comparing the MFW and ecological footprints of some Mediterranean (MEC) and North European (NEC) countries.

METHODS

The MFW from six Mediterranean and North European countries has been calculated as follows: i) EBF, considered as the fat resulted from the difference between ideal and real body weight of overweight and obese individuals, based on FAOSTAT and WHO databases [1]; ii) food wasted for EBF accumulation and energy from the main food categories by retrieving the FAO Food Balance Sheets 2010-2019 [2]; iii) GHG emissions and water and land impact to EBF by foods, according to WWF Virtual Shopping Cart [3] and Barilla Centre for Food and Nutrition [4]. Data were standardized as for the total population, and for 100,000 citizens.

RESULTS

NEC had the highest rates of obese individuals (UK and Sweden on the top) while MEC had slightly higher overweight people rates (Italy and France on the top). An overall higher EBF value for 100,000 citizens, both obese subjects and overweight, was found in NEC compared to MEC, in both cases led by low population countries. Data on MFW and ecological footprints showed that, regardless of the country, obese individuals had an impact two-to-three folds higher than overweight subjects. Highest values of MFW and ecological footprints were found for MEC compared to NEC as for the whole and overweight/obese populations.

CONCLUSIONS

This study highlights the harmful role of over-eating and – consequently – overweighting not only on human health but also on food waste rates and the associated resource exploitations of the Earth. In particular, the consideration of MEC as holders of the Mediterranean Diet, one of the healthiest and most sustainable dietary patterns, should be carefully reconsidered. Informational campaigns should be developed to improve awareness of conscious dietary choices for the health of both humans and the planet.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 16 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

SOAP16_01

HEMOGLOBIN MEDIATES ASSOCIATION BETWEEN AIR POLLUTION AND GROWTH: MODERATING EFFECTS OF NUTRITION

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BACKGROUND AND OBJECTIVES
There have been inconsistent findings in previous studies regarding the relationship between air pollutants and hemoglobin of offspring as well as that between air pollutants and development in offspring. There have been a few studies that have examined the postnatal effects of air pollution on offspring. A unified nutrition package (YingYangBao, YYB) intervention study has been conducted in China in order to improve the growth and development of children in anemia areas, but the RESULTS have also been inconsistent. The purpose of this study was to examine the relationship between air pollution (PM2.5, PM10, SO2, and CO), the hemoglobin of offspring, stunting, and underweight. This study also explores whether hemoglobin levels play an intermediary role, as well as evaluates the regulation effect of nutrition on hemoglobin levels.
METHODS

A unified nutrition package intervention study was conducted in western, China between 2016 and 2023. In accordance with WHO guidelines, stunting, underweight, height-for-age z score (HFA), weight-for-age z score (WFA), and anemia status were all defined. A daily average of PM2.5, PM10, SO2, and CO levels was collected from the National Urban Air Quality Real-Time Dissemination Platform (http://www.cnemc.cn/sssj/) of the China Environmental Monitoring General Station. Linear regression and logistic regression models were used to assess the correlation between air pollution and the above indicators. The role of nutrition in this was also assessed.

RESULTS

A total of 10766 children under 5 years of age participated in this study. According to our study, all four categories of air pollutants reduce hemoglobin levels, but their associations with growth and development were not uniform. Additionally, air pollution had a greater impact on growth in individuals who were anemic than in those who were not anemic. The levels of hemoglobin were responsible for 13% of the HFA caused by air pollution. Furthermore, the length of time a nutrition package is in use may be able to regulate the effects of air pollution on hemoglobin and HFA. Nutrition packs(YYB) are beneficial when used for longer than 10 months by children under 60 months of age, as they reduce the adverse effects of air pollution.

CONCLUSIONS

This study contributes to the research regarding the association between exposure to air pollution and hemoglobin and growth in offspring. As a result of our study, we have discovered that air pollution levels affect the hemoglobin and development of offspring. Nutritional interventions may be able to mitigate the negative effects of air pollution.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP16_02

THE ENVIRONMENTAL IMPACT OF DIET IN LATIN AMERICAN POPULATIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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BACKGROUND AND OBJECTIVES

Several studies have estimated the environmental impact of dietary patterns based on food consumption data from developed countries (1-5). Their findings have been collated in several systematic reviews examining the impact of dietary choices on both environmental sustainability and health (6-10). However, equivalent analyses in developing regions, particularly Latin America, are limited. This systematic review and meta-analysis aimed to examine and synthesize available data on the environmental impacts of dietary patterns in Latin American populations.

METHODS

Searches were conducted using Medline, Embase, Web of Science and Scopus databases. Inclusion criteria were studies measuring different environmental impact indicators (EIIs) such as carbon, water or ecological footprint related to food consumption in Latin American countries. We synthesized the evidence on the most reported EIIs, considering socio-demographic factors and food contribution where available. Pooled estimates for average carbon and water footprints were derived for individual countries, considering crude and energy-adjusted (to 2000 Kcal) values, dietary assessment method, and sociodemographic variables.

RESULTS

Of the 3980 studies screened, 29 met the eligibility criteria. Data on the environmental impact of diet were reported for eight Latin American countries with most studies conducted in Brazil. Carbon and water footprints were the most commonly reported EIIs. Dietary carbon footprint (CF) ranged from 2.5 to 6.4 Kg CO2-equivalents/person/day/2000 Kcal, with Argentina and Brazil showing the highest emissions. The water footprint was between 2078 and 4614 L/person/day/2000 Kcal for Chile and Brazil, respectively. Beef contributed the largest share (around 70%) of environmental impact, while pulses, vegetables, and seafood had the lowest (approximately 5%). Higher CFs were observed for individuals with higher education levels and in urban locations (p-value<0.05).

CONCLUSIONS

Our review reveals a significant lack of research on the environmental impact of diet in Latin American populations, beyond Brazil. Establishment of a regional database, documenting the environmental footprint of commonly consumed foods, would support development of evidence-based public policies to achieve more sustainable diets in Latin America.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP16_03

PERCEPTIONS OF A MORE PLANT-BASED DIET IN A WESTERN EUROPEAN COUNTRY: PERSONAL DIETARY HABITS, EDUCATION AND CURRICULUM IN SCHOOLS, AND SUBSIDIES TO FARMERS PRODUCING PLANT-BASED FOODS

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BACKGROUND AND OBJECTIVES

Health and environmentally sustainable food based dietary recommendations are aiming for a decreased intake of food from animal sources, especially red meat, and more nutritious and variable plant-based dietary options. This is a challenge that includes raising knowledge, changes in food policy, production and consumption habits. The objectives of this study was to gather knowledge on adults‘ perseptions of plant-rich diets, i.e., as their personal dietary habits, as the diet of the future to include in education and schools‘ curricula, and as subsidies to farmers to locally produce plant-based foods.

METHODS

Online opinion questions to a population representative group of adults were used to collect perspectives to 1. transitioning towards a more plant-based personal diet for health and the environment, 2. inclusion of education on plant-based diet for health and environment in preschool and elementary school curricula, and 3. Subsidies to farmers for production of more plant-based food products. Differences between demographics were tested by chi squared test.

RESULTS

1. 37% of respondents were positive towards personal diet transition, 33% were negative; 2. 51% were positive towards education about plant-based diets for health and environment in preschools and elementary schools, 14% negative; 3. 73% were positive towards supporting farmers to increase production of plant-based foods, 5% negative. Women, people living in a city and university-educated were more positive to all changes than men ($p<0.001$), people living outside bigger cities ($p<0.001$, $p<0.01$, $p<0.01$), and people with lower educational degree ($p<0.001$), respectively.

CONCLUSIONS

There was less willingness to alter personal diets than to support societal-level changes, incorporating plant-based topics into school curricula and providing subsidies to farmers. Strongest agreement was found for the support to farmers to produce more varied plant-based type of food.

CONFLICTS OF INTERESTS
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SOAP16_04

ENHANCING DIVERSITY AND ENVIRONMENTAL SUSTAINABILITY OF SUPPLEMENTARY NUTRITION PROGRAM UNDER INTEGRATED CHILD DEVELOPMENT SERVICES SCHEME: STAKEHOLDERS' PERCEPTIONS FROM RURAL CHHATTISGARH, INDIA

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BACKGROUND AND OBJECTIVES

The Supplementary Nutrition Program (SNP) under Integrated Child Development Services (ICDS) Scheme in India aims to bridge the nutrition gap among young children, pregnant and lactating women [1]. With its extensive outreach the program presents an ideal platform for promoting diverse, nutritious and sustainable diets [2]. This study explores stakeholders' perceptions on diversifying food/meals and promoting environmental sustainability within SNP-ICDS in rural Chhattisgarh.

METHODS

An exploratory qualitative study was conducted in Sarguja district, Chhattisgarh engaging with program implementers and facilitators at grassroots, block and district level. Participants included Anganwadi workers, self-help groups (SHGs), Panchayati Raj Institution members (rural local self-government), Child Development Project Officer (block level), district program officer (district level) along with program recipients. Data was collected using semi-structured interviews and focus group discussions, and analysed through inductive thematic approach to identify themes on key aspects influencing meal diversity, environmental sustainability and potential strategies to improve the same.

RESULTS

Provisions under the SNP-ICDS include hot cooked meals (rice served with pulse preparation) for children aged 3-6 years and take-home rations (ready-to-eat premix packets) for children aged 6 months to 3 years, pregnant and lactating women. Meals were perceived as monotonous by the stakeholders. SHGs, who play a key role in procuring food ingredients for meals, reported budgetary constraints that hinder procurement of diverse food items. Stakeholders proposed local food procurement from small-scale farmers and establishing nutrition gardens managed by SHGs as key intervention strategies. Community mobilization for inculcating a sense of shared ownership and convergence with other government departments including Panchayati Raj, rural development, water, and horticulture were suggested. Capacity building of grassroots stakeholders on dietary diversity, preparation of low-cost nutritious meals, along with advocacy for local food procurement, improved budget allocation were considered crucial strategies.

CONCLUSIONS

The study highlights opportunities to enhance dietary diversity and sustainability within the SNP-ICDS through local food procurement. Fostering collaboration with various government departments, community mobilization, addressing logistical and financial challenges could significantly strengthen program's effectiveness and sustainability.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP16_06

SUSTAINABILITY NUTRITION BALANCE: A METRIC INTEGRATING NUTRITION AND ENVIRONMENTAL IMPACT OF FOODS IN THE CONTEXT OF WHOLE DIETS

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BACKGROUND AND OBJECTIVES

Food consumption significantly impacts both human and planetary health, demanding integrative approaches to assessing the nutrition and environmental sustainability of food products. Because food products are not consumed in isolation but within the context of entire diets, the nutritional value and environmental burden of a food product is dependent on the dietary context. This study evaluates the Sustainability Nutrition Balance (SNB) score, an integrated metric indicating the environmental burden of food products in relation to the nutritional value they bring to a nutritionally adequate diet for a specific population. These scores may be valuable to guide product development and communication in the direction of more nutrient-dense, environmentally sustainable diets.

METHODS

We present a methodological approach for calculating the SNB score using an optimization-based framework incorporating Dutch nutrition recommendations and food consumption, composition and cradle-to-plate environmental impact data. The dependency on the dietary context was tested by calculating the SNB score for different age- and sex-groups. Various methodological choices, including optimization strategies and regression approach, were systematically tested for their influence on the SNB score. Sensitivity analyses using Monte Carlo simulations were conducted to evaluate the robustness of the RESULTS.

RESULTS

As anticipated and intended, the SNB score demonstrated high dependency on the dietary context. Although mean SNB scores of food groups differed across the different age- and sex-groups, they generally followed the same direction expect for legumes: the mean SNB score of legumes was negative for women and positive for men. The RESULTS of the Monte Carlo analysis indicate that poor data quality compromised the robustness of the SNB score. Methodological choices such as optimization method and constraints influenced the SNB score, but to a lesser degree as compared to dietary context.

CONCLUSIONS

The SNB score provides a context-sensitive metric integrating nutrition and environmental impact at a diet level. While the approach offers valuable insights, its applicability is limited by data intensity, methodological complexity, and understandability. Future work should focus on simplifying the framework, enhancing data quality, and addressing challenges in global scalability and stakeholder communication.

CONFLICTS OF INTERESTS

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SOAP16_07

Do plant-based foods facilitate a sustainable dietary transition in Europe? RESULTS of a survey in 9 EU Countries

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BACKGROUND AND OBJECTIVES

Most dietary guidelines promote eating predominantly plants for maintaining good health and preventing chronic disease [1]. The more plant-rich the diet is, the lower its environmental footprint [2]. Although, a dietary shift towards more plant-based diets is desirable from human and environmental health, changing food behaviours at population level is challenging [3–5]. Therefore, the objective of this study is to describe the sociodemographic characteristics of EU citizens who consider that plant-based foods facilitate the dietary transition.

METHODS

Data Collection: A cross-sectional survey was conducted online by Enkätfabriken AB before and after the holiday season (40% December, 2023; 60% February, 2024) in BE, CH, DE, DK FI, FR, IT, RO, SE [6]. The questionnaire covered sociodemographic characteristics (e.g. age, sex, locality of residence, education, diet lifestyle), and several attitudinal statements measured with a 7-point Likert scale.

Data Analysis: A dummy variable was created for the statement "PBF contribute to a sustainable healthy diet transition," with 5–7 (agreement) coded as 1 and 1–4 (disagreement/neutral) as 0. This variable was used as dependent in a logistic regression controlling for the effect of sociodemographic characteristics. A p-value below 0.05 was considered significant.

RESULTS

The likelihood of agreement was positively associated with higher educational achievement, self-reported financial status, and a more plant-based diet. Conversely, agreement was less likely among older individuals, men, and those living in rural areas. A green persona profile was associated with young, urban, university-educated women who were financially better off, not living alone, and followed a plant-based diet.

CONCLUSIONS

CONCLUSIONS: Interventions aimed at promoting a sustainable dietary shift should be inclusive and specifically target middle-aged men, rural residents, individuals without a university education, those experiencing financial struggles, living alone, and following an omnivorous diet.Funding: HealthFerm Project, WP4 Consumer studies, Horizon Europe GA 101060247 and from the Swiss State Secretariat for Education, Research and Innovation (SERI) contract No. 22.00210.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP16_08

OPTIMIZATION OF CHILDREN'S DIETS IN BURKINA FASO TOWARDS HEALTHIER, MORE AFFORDABLE, AND SUSTAINABLE DIETS

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BACKGROUND AND OBJECTIVES

Dietary guidelines have not yet been established for Burkinabe children, who continue to face health risks linked to poor diet quality amidst economic and natural resource constraints. The aim of this study was to formulate context-specific, healthy, affordable and sustainable diet recommendations that take into account the habitual consumption patterns for children in Burkina Faso.

METHODS

We optimized the diet of 3,932 children 2 to 8 years of age, living in rural Burkina Faso. We used 24h recall data collected at lean and post-harvest seasons between 2017 and 2020. We implemented three rounds of multi-start hierarchical optimizations using constraints on deviations from habitual diet, healthiness, affordability, and sustainability by altering criterion priority. Firstly, we prioritized deviations from habitual diet and healthiness by optimizing diets to meet a set of nutritional constraints while minimizing the deviation from the habitual diet (Step 1). Second, we minimized the cost of the diet under nutritional constraints, ensuring that the deviation from the habitual diet did not exceed the deviation found in Step 1 (Step 2). Finally, we minimized water use as a proxy for the environmental footprint, while still meeting constraints established in previous steps as well as an additional constraint on land use (Step 3).

RESULTS

All optimized diets maintained the most consumed staple food but slightly reduced the number of weekly portions in favor of additional portions of beans, fruits, vegetables, and animal source foods. Fish was favored among flesh foods due to its lower cost in our study area, and optimized diets generally included three additional portions of fish and one portion of red meat or poultry per week compared to habitual diets where flesh foods are barely consumed. Eggs (up to two more eggs per week) and dairy (three additional portions per week) were also introduced in optimized diets. Though minimized, the cost of the optimized diets was higher than that of the habitual diets ($3 vs. $2 US dollar/child/day). Water use necessary to meet all our constraints was two times higher than that for the habitual diet.

CONCLUSIONS

Healthier diets in Burkina Faso require more diversity with the inclusion of more fruits, vegetables, and animal source foods. The economic cost and environmental footprint of these optimized diets are higher than that of current diets. In the context of poverty and climate change crisis, identifying effective policy actions to make these diets more accessible is therefore crucial.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP16_10

MICROBIAL COMMUNITY ASSEMBLY AND METABOLIC DIVERSITY IN A LEGUME-BASED MATRIX (SYMPOSIUM BIOSPHERA)

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BACKGROUND AND OBJECTIVES

The current food system significantly contributes to the ongoing environmental crisis. In recent decades, efforts have been made to mitigate this impact, particularly by promoting increased consumption of plant-based proteins in place of animal-based proteins. Legumes, which are high in protein, fiber, and minerals, represent a sustainable and healthy alternative to animal-derived proteins. However, legumes can contain anti-nutritional factors that represent an obstacle to their consumption.

The main objective of this study is to establish a synthetic ecology approach, combined with consumer science METHODSthrough living labs, to design microbial communities capable of fermenting legume-based matrices while enhancing product nutritional and sensory qualities to meet consumers' expectations.
METHODS

For this study, three legume flours (chickpea, green lentil, and coral lentil) have been selected for fermentation based on their nutritional values and sourcing. Several microbial communities with varying functionalities have been chosen using genome-based modelling and empirical knowledge from a preselected subset of lactic acid bacteria, cheese-ripening bacteria, yeasts, and other bacteria from plant and dairy products.

To achieve healthy and sustainable legume-based products in line with consumers' expectations, living labs have been organized with different stakeholders to assess their expectations.

RESULTS

Using insights from the living labs, we have proposed a minimalist process for formulating a cheese-like product. the ability of selected microbial communities to ferment legume-based matrices while enhancing organoleptic and nutritional properties is being tested.

CONCLUSIONS
The RESULTS of this research will provide insights into the potential of different microbial consortia to colonize legume-based food matrices and deliver desirable nutritional and sensory properties. Additionally, we aim to propose guidelines for developing new legume-enriched products that meet sensory and functional requirements, as well as consumer needs and expectations. Furthermore, the study will provide manufacturers with models for fermented legume-based products suitable for pilot testing.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP16_11

PHYSICOCHEMICAL CHARACTERISTICS OF THE PULP, SEEDS, AND POMACE OF UNDERUTILIZED BAEL (AEGLE MARMELOS) FRUIT

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BACKGROUND AND OBJECTIVES

Aegle marmelos family Rutaceae commonly known as bael is a highly nutritious and well known for its wide range of medicinal attributes, is one of the fruit crops that earns the limited attention and utilization. It has been utilised for treating pain in conventional medical systems from antiquity like dysentery, diarrhoea, constipation, peptic ulcer and respiratory infections. Actions that have antimicrobial, anti-inflammatory, antidiabetic, antipyretic, analgesic, cardioprotective, anticancer, and radioprotective and antispermatogenic properties are also unveiled by bael. The bael processed products having nutritional and healing properties. The present research was conducted to evaluate physicochemical properties of seeds, pomace and pulp (without seeds) of bael fruit.

METHODS

Proximate composition, Dietary fibre (soluble and insoluble), amino acid profile, fatty acid profile, mineral content and antioxidant activity by DPPH were analysed using standard protocols

RESULTS

It was found that bael pulp, seeds and pomace are good source of protein, crude fibre, fat, ash, and dietary fibre. Dietary fibre was the major components in pulp, seeds and pomace among all the components. Seeds contained higher dietary fibre followed by pomace and fruit pulp (20.33, 20.5 and 13.19 g/100g). The seeds of bael fruit contained higher insoluble dietary fibre (17.14 g/100g) whereas pomace contained higher soluble dietary fibre (11.11g/100g) than other parts of bael under investigation. The seeds of bael fruit also contained higher protein content (19.61g/100g) than other parts of bael. Calcium, potassium and iron were observed in major quantities in seed powder. Amino acids and fatty acids occurred in good quantities in seed powder. Arginine and glutamic acid were prominent amino acids in seed powder. Palmitic acid and Oleic Acid were the predominant fatty acids in seed powder. Pomace powder showed good antioxidant activity.

CONCLUSIONS

Bael fruit has a therapeutic, medicinal, and nutritional value. It is urgently required to develop the technology for transforming this underutilised but magnificent fruit into new, viable value-added resources.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP16_12

DIET QUALITY AND SUSTAINABLE LIFESTYLES, IBERO-AMERICAN MULTICENTER STUDY

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BACKGROUND AND OBJECTIVES

Low diet quality is associated with increased morbidity and mortality, however, it has not been explored whether diet quality is associated with sustainable lifestyles. The aim of this study is to associate diet quality with sustainable activities in Ibero-America.

METHODS

An observational, analytical, multicenter study was conducted with 6,067 participants from 14 Ibero-American countries via an online survey. Diet quality Healthy eating habits were assessed by measuring the frequency of consumption of the recommended food groups (fruits, vegetables, dairy, eggs, meat, legumes, breakfast and bread). Based on the frequency of consumption, each of the questions was scored as follows: “no consumption” (1 point), ‘less than recommended consumption’ (3 points), ‘suggested daily/weekly servings’ (5 points). The survey on sustainable lifestyles was validated and subdivided into 3 items: 15 questions that evaluate food and shopping; 12 questions that evaluate transportation, recreation and self-care; and 11 questions that evaluate the environment. This gives a range between 50 and 185 points, the higher the score, the better the adherence to sustainable lifestyles. Linear regression models were applied, adjusted for sex, nutritional status, schooling and age.

RESULTS

The mean age of the participants was 35.2 years (SD 12.7). When performing the associations between diet quality and sustainable lifestyles, it is observed that in reference to the first quartile, as diet quality increases, better sustainable lifestyles are presented, quartile 2 (β: 4.394; CI95% 3.99.445- 5.588), quartile 3 (β: 6.762; CI95% 5.556- 7.968) and quartile 4 (β: 10.525; Ci95% 9.234-11.816).

CONCLUSIONS

The higher quality diet is positively associated with presenting better sustainable lifestyles.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP16_13

PSYCHOMETRIC EVALUATION OF THE GERMAN VERSION OF THE SUSTAINABLE FOOD CHOICE QUESTIONNAIRE (SUS-FCQ) IN A REPRESENTATIVE GERMAN SAMPLE

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BACKGROUND AND OBJECTIVES

To promote sustainable diets with a low environmental impact, it is crucial to understand the determinants that shape sustainable food choices. One important determinant is food choice motives, which refer to the motives, reasons or motivations behind choosing certain foods. Compared to broader determinants such as personality or values, these motives are more closely related to specific food choice decisions. Verain and colleagues (2021) developed the Sustainable Food Choice Questionnaire (SUS-FCQ), which assesses sustainable food choice motives. Since no German version of the SUS-FCQ has been available to date, we have translated the SUS-FCQ into German and will investigate its psychometric properties.

METHODS

In February 2025, we will conduct this pre-registered study. We will collect a representative sample (N = 660 participants) through a market research institute. The sample will be representative of the German adult population in terms of gender, age, and place of residence (federal state). In addition to the SUS-FCQ, the following questionnaires will be administered: Intuitive Eating Scale-3 (IES-3), Subscale Restrained Eating of the Dutch Eating Behavior Questionnaire (RE-DEBQ), Subscales Health, Social Image and Price of The Eating Motivation Survey (TEMS), Subscales Environmental, Social and Economic Sustainable Attitudes of the Sustainable Consciousness Questionnaire (SCQ) and Subscale Impression Management of the Balanced Inventory of Desirable Responding (BIDR-IM-SF).

RESULTS

We will present the RESULTS of the psychometric evaluation of the SUS-FCQ. We will assess the factor structure using a confirmatory factor analysis (CFA) and internal consistency using McDonald's Omega. We will test the convergent validity by examining the relationships of the SUS-FCQ with the IES-3, RE-DEBQ, the subscales of the TEMS, the subscales of the SCQ and BIDR-IM-SF through correlation coefficients. Furthermore, we will explore group differences in the SUS-FCQ based on gender, age, socioeconomic status (SES) and weight status.

CONCLUSIONS

We expect the German version of the SUS-FCQ to be a reliable and valid instrument for measuring sustainable food choice motives. By providing a German version of the SUS-FCQ, we aim to facilitate cross-country comparisons and investigate cultural differences in sustainable food choice motives.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP16_14

RELATIVE ENVIRONMENTAL IMPACTS AND MONETARY COST OF FOOD CATEGORIES: FUNCTIONAL UNIT MATTERS

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BACKGROUND AND OBJECTIVES

The functional unit (FU) usually used to express the environmental impact or cost of a food is the mass (1 kg). The aim of this study was to explore how the choice of a functional unit (FU) influences the environmental and economic rankings of food categories.

METHODS

Dietary data from the latest French national food survey (INCA3) as well as data on the nutritional composition (CIQUAL), environmental impacts (Agribalyse V3.1) and average price (Kantar) of each food consumed in INCA3 were merged together. For each INCA3 adult (n=2121), we estimated nutrient intakes, environmental impacts (14 metrics) and monetary costs associated with her/his consumption of 20 food categories. Still at the individual level, we expressed the environmental impacts and monetary costs of each food category per weight consumed (1 kg) and also according to 3 others general FUs (100 kcal, 1 portion, 1 overall nutritional quality unit) and to 9 nutrient-specific FUs (e.g. 50 g of protein, 30 g of fiber, etc.). Finally, for each FU, the food categories were ranked according to their median impact calculated among individuals. To express the RESULTS, food categories were classified in 3 classes according to the food source: animal (ruminant meat, seafoods, …), plant (fruits, vegetables, legumes, …) and animal co-products (dairy products, animal fats, eggs).

RESULTS

When FU was mass (1 kg), the animal source food categories were more impactful and more expensive than the plant source food categories. However, for other FUs, the rankings of food categories differed, particularly with the overall nutritional quality FU. For example, while seafoods was the most expensive and the third highest global warming potential (GWP) food category for the 1kg FU, it was among the least expensive (ranked 12th for cost) and least impactful (ranked 13th for GWP) with the overall nutritional quality FU. Despite such differential rankings, some food categories rankings were persistent whatever the FUs: compared to other food categories, legumes, potatoes and whole grains were less expensive and less impactful, meats (especially ruminant ones) were more expensive and more impactful. Dairy and eggs were ranked mostly in the middle of the range of plant-based foods, both in terms of price and environmental impact.

CONCLUSIONS

By providing a broad overview of different “metric × UF” situations, this study illustrates the major influence of FU choice on the hierarchy of food costs and environmental impacts. It highlights the complexity of assessing sustainability at the food level and the need for caution when developing recommendations.

CONFLICTS OF INTERESTS

FV, MM (MS-Nutrition) ; ND, MP (INRAe) and AR (ACTALIA) received financial support for this study from the French dairy interprofessional organization (CNIEL). CM is employee of CNIEL.

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SOAP16_15

KEY TRANSITIONS TOWARDS A HEALTHIER AND MORE SUSTAINABLE FOOD ENVIRONMENT IN DUTCH HOSPITALS

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BACKGROUND AND OBJECTIVES
Healthcare settings provide a vital platform to promote healthy and sustainable food choices among patients, staff and visitors through their food environments. We designed the Dutch national intervention program 'A-Taste-of-Excellent-Healthcare' (TEH) to support hospitals to achieve a better food environment for patients, staff and visitors by 2030 (1) via a comprehensive learning network and toolkit featuring a step-by-step implementation plan (2) and hereby present the RESULTS between 2020-24.
METHODS

20 frontrunning hospitals self-monitored their progression using a traffic light system based on Dutch, evidence-based nutrition guidelines and additional open questions. We use descriptive analyses to present data on implementation progress of actions for a better food environment.

RESULTS

All 20 hospitals entered TEH with a vision for healthy foods for patients and developed a vision for healthy foods for staff and visitors within 2 years (Figure in 3). Hospitals reported an increase in the availability of healthy foods, especially for patients and staff, e.g. more whole-grain options and fewer sugar-sweetened beverages. In line with increasing attention for sustainable nutrition, hospitals increasingly have more attention for sustainable foods, e.g. more plant-based proteins and meals. 19 hospitals (95%) developed a vision for sustainable nutrition for patients and 1 hospital was working towards this; for staff and visitors this was 85%. In 2024, 65% hospitals monitored food waste; for staff and visitors this was 75% and 85%. 10 of these frontrunner hospitals are working towards the aim to offer a minimum of 50% of protein as plant-based for visitors and for staff. For patients this is not monitored (yet) as it remains to be investigated what is medically responsible.

CONCLUSIONS
These RESULTS show that hospitals can shift towards better food environments within 2-4 years, with most substantial improvements in patients and staff's food environments. However, achieving more sustainable food offerings requires additional focus, particularly to address the needs of patients at risk of malnutrition. This national program serves as a model and knowledge resource to enhance health outcomes by leveraging nutrition in disease management and rehabilitation. In addition, it supports the aims of the national Greendeal sustainable healthcare (4) as hospitals are responsible for 7% of Dutch CO2 emissions. Fostering healthier and more sustainable food environments also benefits staff and visitors, promoting greater vitality and well-being, and ultimately also planet.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 19 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

SOAP19_01

MORE FOOD BIODIVERSITY IN DUTCH DIET DOES NOT LEAD TO LESS ENVIRONMENTAL IMPACT

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BACKGROUND AND OBJECTIVES

Poor diets significantly impact human and planetary health. Western diets are becoming more monotonous and, consequently, lack biodiversity. This dietary trend influences the dynamics of the Western diet and global food supply chains, further impacting agricultural and environmental factors. Understanding the role of food biodiversity in diet is essential for addressing human and planetary health.

METHODS

We assessed the associations between food biodiversity, measured as Dietary Species Richness (DSR), and six diet-related environmental impact factors: global warming, terrestrial acidification, freshwater eutrophication, marine eutrophication, land use and water consumption. Dietary intake data were retrieved from a nationally representative sample the Dutch National Food Consumption Survey 2012–2016, comprising of 2078 Dutch adults aged 19 to 79 years, collected via two non-consecutive 24-hour dietary recalls. DSR scores were calculated based on the count of unique biological species consumed over the two measurement days. Included food groups were fruits, vegetables, nuts and seeds, legumes, tubers, grains, meat, fish, and dairy. Excluded from the DSR calculation were alcoholic and nonalcoholic beverages, savory snacks, sugars, confectionery, oils, fats, condiments, spices, sauces, processed meat substitutes, and other highly processed foods. Diet-related environmental impact data were obtained from the Lifecycle Assessment database of the National Institute for Public Health and the Environment of the Netherlands(v2019). Associations between DSR scores and environmental impact factors were examined using separate linear regression analyses, with models adjusted for age, sex, educational level, energy intake and seasonality.

RESULTS

The mean DSR was 13.0 species (SD 4.55) ranging from 2-33 species over two days. Higher DSR was associated with slightly higher greenhouse gas emissions (β0.053 [95%CI 0.028-0.077]), freshwater eutrophication (β8.429E-6 [95%CI 6.63E-6 – 1.02E-5]), land use (β0.015 [95%CI 0.002-0.028]) and water consumption (β0.013 [95%CI 0.011-0.014]). DSR was not associated with terrestrial acidification and marine eutrophication (p-values >0.05).

CONCLUSIONS

The RESULTS of this study suggests that for every additional species consumed the environmental impact of the diet increases. Our findings underscore the complex relationship between DSR and environmental impact factors and the need for nuanced approaches to mitigate environmental impacts while promoting dietary diversity.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP19_02

DIETARY ENVIRONMENTAL IMPACT, FOOD INTAKE, AND MICRONUTRIENT STATUS IN ELDERLY: THE LIFELINES-MINUTHE STUDY

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BACKGROUND AND OBJECTIVES

The growing global population demands a shift towards sustainable diets that are healthy, environmentally friendly, acceptable, and affordable. A shift towards different food sources (e.g., more plant-based) has consequences for micronutrient intake and bioavailability. This study examines whether micronutrient status in elderly, a population at risk of deficiency, is different between diets with high or low environmental impact.

METHODS

For 689 participants of the Lifelines-MINUTHE (Micronutrients and Health inequalities in Elderly) study, dietary intake was assessed using the Lifelines Food Frequency Questionnaire (207 food items). Diet-induced GHGE and BWC were calculated using Lifecycle Assessment data by the Dutch Institute for Public Health and the Environment and adjusted for food weight to examine the dietary patterns. Micronutrient status was assessed by serum levels and 24-hour urinary excretion. Nutrient status is presented as median (Q1-Q3) and differences between high and low impact diets were tested using the Mann-Whitney U test.

RESULTS

Mean ± sd age was 64 ± 4 years and 51% was male. Meat (beef and pork), ready-to-eat meals, cheese, and vegetables mostly contributed to GHGE. Fruit, fats and oils, cooked grains, nuts, and vegetables mostly contributed to BWC. The lowest GHGE tertile, compared to the highest, had lower 24-hour urinary excretion (mmol/day) of sodium (138 (108-186) vs. 156 (123-192), $p = 0.009$) and protein biomarker urea (366 (310-454) vs. 404 (339-490), $p < 0.001$). Low dietary GHGE was also related to lower serum levels of vitamin E (γ-tocopherol) (1.5 (1.2-2.0) vs. 1.7 (1.4-2.3) µmol/L, $p < 0.001$). Evaluating sustainability from water consumption perspective, the lowest BWC tertile, compared to the highest, had lower serum levels of folic acid (14.6 (10.5-22.1) vs. 18.6 (12.7-27.3) nmol/L, $p < 0.001$), vitamin B6 (53 (35-79) vs. 60 (42-92) nmol/L, $p = 0.004$), vitamin B12 (265 (209-338) vs. 300 (230-337) pmol/L, $p = 0.017$), vitamin D3 (62 (43-75) vs. 65 (49-80) nmol/L, $p = 0.040$), and vitamin E (α-tocopherol) (33 (28-38) vs. 34 (30-39) µmol/L, $p = 0.012$), and higher excretion of sodium (155 (124-193) vs. 143 (109-184) mmol/day). Data analyses on nutrient (in)adequacy and additional biomarkers are ongoing.

CONCLUSIONS

Dietary patterns with lower environmental impact in diverse domains are associated with altered (sub)clinical nutrient status. Dietary recommendations promoting lower environmental impact should carefully consider nutrient adequacy, particularly in populations at risk for deficiency.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP19_03

AGE AND SEX RELATED DIFFERENCES IN DIETARY PROTEIN INTAKE IN THE PROTEIN-I STUDY

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BACKGROUND AND OBJECTIVES

Plant-based dietary patterns have gained popularity for both human and planetary health reasons. Protein diversification offers a practical way to transition to a more sustainable and healthy diet, while also protecting the environment. The aim of this analysis was to examine age and sex related differences in protein intake from baseline data of the Protein-I study.

METHODS

A 16-week randomised controlled intervention is underway with healthy adults aged 18-65 years old to examine evidence-based approaches for diversification of protein intake. Baseline data was used for this analysis.

RESULTS

The n=179 sample (60% female, mean age 42.8 years old, mean BMI 25.7kg/m2) had an average protein intake of 1.3±0.46 grams per kilogram body weight per day (g/kg/ BW/d), with 48% meeting or exceeding 1.2g/kg BW/d. Participants under 50 years old had significantly higher average protein intakes (1.3±0.48g/kg BW/d (n=126)) than those over 50 years old (1.1±0.37g/kg BW/d (n=53), $p<0.05$). Males over 50 had the highest prevalence of not meeting an average protein intake of at least 0.83g/kg BW/d (25%, n=5). This contrasts with males under 50, where 98% achieved an intake of at least 0.83g/kg BW/d (n=50). Among females, 18% of those over 50 did not meet an average protein intake of 0.83g/kg BW/d compared to 15% of females under 50. This age-related difference in protein intake was less pronounced in females (3%) than in males (23%). Food groups predominantly contributing to protein intake varied across age groups, where key food groups contributing to protein intake in participants under 50 were unprocessed white meat (12%), vegetables and vegetable dishes (9%) and unprocessed red meat (7%). The food groups predominantly contributing to protein intake in participants over 50 were vegetables and vegetable dishes (11%), unprocessed white meat (9%) and fish and fish dishes (7%).

CONCLUSIONS

Age and sex related differences in protein intake were identified, where protein intake was significantly higher in participants under 50 years old. The difference in meeting an average protein intake of 0.83 g/kg BW/d across age groups was less pronounced in females compared to males. Animal protein sources emerged as key contributors to protein intake in both age groups, but featured more prominently in the under 50 year old age group. These RESULTS highlight the potential to broaden protein intake across a wider range of foods and emphasises the importance of personalised dietary advice rather than a ‘one-size fits all’ approach.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP19_04

ENVIRONMENTAL CHANGE AND THE DOUBLE BURDEN OF MALNUTRITION IN LMICS: AN EVIDENCE- AND SYSTEMS-BASED CONCEPTUAL FRAMEWORK

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BACKGROUND AND OBJECTIVES

Increasingly globalised food systems of many low- and middle-income countries (LMICs) have led to a 'double-burden of malnutrition' (DBM), where overnutrition and undernutrition co-exist within the same population, household or individual. Climate-driven environmental change is intrinsically linked to food systems, which need to both adapt to and mitigate further environmental degradation. This study aimed to describe the food system drivers that interconnect climate and climate-driven environmental change and the DBM in LMICs, using an evidence- and systems-based approach.

METHODS

We conducted a realist-informed review of evidence synthesis studies to construct the evidence base that informed the development of the conceptual framework. The framework was then synthesised as a systems map to emphasize the co-evolution between factors and dynamics involved.

RESULTS

Interconnections between environmental change and the DBM were described across several planetary boundaries, such as climate change, biodiversity loss, land system change, freshwater use, and nitrogen and phosphorus flows, including fertiliser use. Feedback loops, accumulations, and delays characterise these interconnections, highlighting sources of potential policy resistance related to climate mitigation and adaptation actions and side effects against the DBM.

CONCLUSIONS

Addressing the DBM in a constantly changing climate requires triple duty actions that target food systems without causing unintended harm to the environment, while opportunities for nutritional health and environmental co-benefits are also evident. Using a system-based approach highlights key points of policy resistance and leverage points for effective action within the complex system of overnutrition, undernutrition, and environmental change.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP19_05

BARRIERS TO ADOPTING A MORE PLANT-BASED DIET IN OLDER ADULTS

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BACKGROUND AND OBJECTIVES

A shift towards diets with more plant-based proteins and less animal-based proteins will provide important benefits for both health as well as the environment (1). However, changing dietary behaviour is challenging. To date, limited research has been conducted on the barriers to adopting a more plant-based diet among older adults (2,3). Therefore, the aim of this study was to identify and understand these barriers in older adults.

METHODS

Nine semi-structured focus group discussions were conducted, involving 41 participants (aged 55-90 years; independently living). Each group discussion consisted of several rounds, starting with a group conversation on the role and importance of animal products in a person’s diet, followed by a discussion on barriers towards more plant-based diets and possible factors to facilitate a change in diet. Finally people were asked whether they agreed or disagreed with a number of statements. Sessions were audio-recorded and transcribed. Thematic analysis was applied on the data to understand the barriers.

RESULTS

The focus group RESULTS show various barriers. Common barriers are that plant-based diets are difficult to prepare and ask for special preparation skills, while meat substitutes are less appreciated. Social environment appears to have a strong influence on people's diet. For some of the older adults plant-based food is negatively associated with veganism. A part of the group has the prevailing belief that animal products like meat and milk are essential for health. These ideas are strongly anchored through information they have received in the past. Some of the participants also indicated that animal proteins should always be part of a meal, otherwise 'it is not a real meal'.

CONCLUSIONS

Our findings show that older adults experience practical objections and obstacles as well as deeper beliefs that might hinder behavioural change. Challenging existing beliefs and overcoming the barriers offers opportunities for adopting more sustainable plant-based diets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP19_06

ADHERENCE TO THE TRADITIONAL CHINESE DIET AND ITS ASSOCIATION WITH ENVIRONMENTAL IMPACTS

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BACKGROUND AND OBJECTIVES

Traditional diets may be sustainable as they might produce low environmental impact. However, little is known about how traditional Chinese diet (TCD) affects environment This study aimed to assess the environmental impacts of adherence to the traditional Chinese diet (TCD).

METHODS

This study utilized data from the China Health and Nutrition Survey, a prospective cohort study conducted across multiple waves, with data collected between 1997 and 2011 selected for analysis. Eligible participants were aged 18 to 74 years, and had participated in at least two survey waves with complete nutrition data available. TCD adherence was measured using a recently developed TCD index, based on three 24-hour recalls data. Environmental impacts were measured by calculating greenhouse gas emissions (GHG) (kgCO2 equivalents), total water footprint (TWF) (m^3) and total land use (m^2). Linear regression models were used to estimate the associations between TCD adherence and environmental impacts.

RESULTS

A total of 11,219 adults were included. The median (IQR) values for GHG emissions, TWF and total land use were 1.7kg (0.48-2.44), 1.38m^3 (0.65-2.35) and 2.66m^2 (1.10-5.26), respectively. Among food groups, rice accounted for the highest proportion of GHG emissions (40.5%) and TWF (26.7%), while beef and beef products contributed the most to total land use (40.1%). Compared to low TCD adherence, high adherence was associated with lower GHG emissions ($\beta = -0.03$ kg CO2e; 95% CI, -0.036, -0.029), lower TWF (β = -0.02 m3; 95% CI, -0.026, -0.014 m3) and lower land use (β = -0.05 m2; 95% CI, -0.07, -0.03 m2).

CONCLUSIONS

High adherence to the TCD may benefit the environment through reduced GHG emissions, TWF, and total land use.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP19_07

SUSTAINABLE AND HEALTHY DIETARY BEHAVIOURS OF UNIVERSITY STUDENTS IN IRELAND: INSIGHTS FROM THE PLAN'EAT PROJECT

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BACKGROUND AND OBJECTIVES

The complexity of modifying dietary behaviours is well established (1). When considering how best to achieve positive dietary change towards more sustainable and healthy dietary behaviours (SHDBs), the university setting has shown promise, providing substantial access to a wide range of young adults who are gaining increasing independence and autonomy with respect to their dietary choices during this life stage (2). As part of the University College Dublin (UCD) PLAN'EAT Living Lab (LL) (3), this study aimed to explore Irish university students' health and lifestyle practices, dietary behaviours, and dietary intakes.

METHODS

The UCD PLAN'EAT LL is a two-year study (February 2024-September 2026), with the aim to co-create, implement, and evaluate a series of interventions to support UCD students' transition towards more SHDBs. Young, healthy UCD students (aged 18-30 years) are currently being recruited to the UCD PLAN'EAT LL, with the aim to recruit 500 students. At LL baseline, participants are invited to complete a demographic, health, lifestyle, and dietary behaviour questionnaire, and up to three 24-hour dietary recalls via an online dietary recall tool, Foodbook24. Statistical analysis was conducted using SPSS (v.29) and R (v.4.3.1).

RESULTS

On average, participants currently enrolled in the LL (n=150) were aged 22 years (range 18 to 30 years), with 78% female (n=117) and 22% male (n=33). Participants were recruited across undergraduate (61%), postgraduate/ master (29%), and PhD (9%) levels, with a minority of participants undertaking alternative courses (1%). Preliminary analysis identified barriers to the consumption of a sustainable and healthy diet. For example, barriers existed for increased fruit and vegetable intake (e.g., price, storage restrictions), increased legume intake (e.g., lack of knowledge, required preparation/ cooking time), reduced meat intake (e.g., perceived nutrient shortfalls, social influences), and reduced high fat, sugar, and salt (HFSS) food intake (e.g., convenience, taste, ease of accessibility).

CONCLUSIONS

This study will provide an insight into university students current health and lifestyle status, dietary behaviours, and dietary intakes. These findings will aid in informing the design of tailored dietary interventions that will be delivered within the UCD PLAN'EAT LL to help support university students' transition towards more SHDBs.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP19_08

ASSOCIATION OF FOOD ENVIRONMENT WITH FOOD SECURITY AND DIET QUALITY IN RURAL COMMUNITIES OF ANDHRA PRADESH, INDIA: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

A good quality diet reduces mortality from major chronic diseases.[1] Food environment influences food choices, preferences, and diet quality of a community, directly impacting nutritional status.[2] Driven by urbanization, and lifestyle changes[3], rural communities are undergoing food environment and nutrition transitions while still struggling with food security challenges.[4],[5] This is leading to a rise in non-communicable diseases as well as malnutrition in low- and middle-income countries.[6] This study assessed association of food environment with food security and dietary diversity among rural communities in Andhra Pradesh, India.

METHODS

A cross-sectional household (HH) survey was carried out in 16 randomly selected villages from four blocks in Srikakulam district, Andhra Pradesh, India. Data were collected from an adult woman in 328 HHs on socio-economic profile, HH food environment profile, HH food security status (n=320), and dietary diversity (n=323) of adult women of reproductive age (18-49 years). A questionnaire was used to assess an adult HH member's lived experience and perception of their HH's food environment. Food Insecurity Experience Scale[7] was used to assess HH food security. A digital tool developed based on Minimum Dietary Diversity for Women[8] was used to assess dietary diversity (24-hour recall). Multivariable linear regression and ordinal logistic regression were used to analyze relationships between food environment, food security, and dietary diversity.

RESULTS

The community majorly accessed food from local markets (99%), government food programs (98%) especially Public Distribution System, farmland (69%), and domesticated animals (36%). The mean Food Access Diversity Index that highlights HH's access to natural food sources was low (0.21±0.29). More than half HHs experienced mild to moderate (48%) or severe food insecurity (12%) while only 40% were food secure. The mean Dietary Diversity Score (DDS) for women was lower than the recommended cut-off of five (4.39±1.27). Analysis revealed that women with DDS ≥5 were 55% less likely to be food insecure ($p<0.01$). Further, those accessing food from kitchen garden were 5.04 times more likely to have DDS ≥ 5 than those who did not ($p<0.05$).

CONCLUSIONS

The findings highlight presence of diverse food environment yet poor dietary diversity. These can inform policies that intend to improve food security and dietary diversity in rural communities. Strengthening local food systems and their integration into government food supplementation programs can be vital in addressing these challenges.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP19_09

EVALUATING ‘CLIMATE FRIENDLY’ CLAIMS ON CONSUMER PERCEPTIONS AND PURCHASE INTENTIONS OF UNSUSTAINABLE FOOD AND BEVERAGE PRODUCTS

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BACKGROUND AND OBJECTIVES

Shifting to healthy and sustainable diets globally is essential for human and planetary health. Misleading environmental claims on unsustainable (i.e., high climate impact) food and beverage products may confuse consumers about their impact and influence purchasing intentions, undermining sustainability and nutrition goals. While it is known that nutrition claims lead to a 'health halo' effect (consumers perceive unhealthy products as healthier), it is unclear if environmental claims on unsustainable products have a similar 'sustainability halo' effect. The objective of this study was to evaluate the impact of environmental claims on consumer perceptions of product sustainability, healthfulness, and purchase intentions.

METHODS

In an online survey, US participants (n=2882) were randomized to view 4 food and beverage products carrying either a ‘climate friendly’ claim (treatment, n=1445) or no claim (control, n=1437). Animal-based foods, such as red meat and dairy, are associated with high greenhouse gas emissions, thus, we selected products in these categories to reflect unsustainable (high climate impact) products. After each product, participants responded to questions such as ‘How good or bad for the environment/health do you think this product is?’ and ‘How likely would you be to purchase this product at the store next week?’, assessed on a 5-point Likert scale from ‘Very Bad’ to ‘Very Good’ and ‘Very Unlikely’ to ‘Very Likely’, respectively. Logistic regression was used to examine the effect of the ‘climate friendly’ claim on perceptions of product sustainability, healthfulness, and purchase intentions.

RESULTS

Across all products, 48% (95%CI:45.6-50.8%) of participants randomized to view the 'climate friendly' claim perceived the products to be environmentally sustainable, compared to 29% (CI:26.6-31.4%) in the control. 38% (CI:35.6-40.6%) of participants who viewed the 'climate friendly' claim perceived the products to be healthy, compared to 31% (CI:29.0-33.9%) in the control. Compared to the control, participants who viewed the 'climate friendly' claim were 2.28 times as likely to perceive the products as sustainable (p<.001), and 1.34 times as likely to perceive the products as healthy (p<.001). However, intentions to purchase unsustainable products did not differ between the treatment and control groups.

CONCLUSIONS

‘Climate friendly’ claims were associated with more positive perceptions of unsustainable food and beverage products’ sustainability and healthfulness, indicating a sustainability and health 'halo' effect. These findings support the need for regulation of environmental claims on products to prevent greenwashing and ensure consumers have reliable information.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP19_10

SHORT-CHAIN CARBOHYDRATE PROFILES AND MICROBIAL COMMUNITY DYNAMICS OF FINNISH FABA BEAN AND PEA TEMPEH INOCULATED WITH RHIZOPUS OLIGOSPORUS, RHIZOPUS ORYZAE AND ASPERGILLUS ORYZAE

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BACKGROUND AND OBJECTIVES

Plant-based foods are a solution for a sustainable future, yet concerns around their digestibility abound. Fermentable short-chain carbohydrates—known as FODMAPs and include raffinose-family oligosaccharies (RFOs)—are nutrients in legumes that are poorly absorbed in the human digestive tract, causing gut symptoms especially for sensitive individuals. Utilisation of fermentation in food processing, such as tempeh, can lower FODMAPs and enhance nutritional profiles. However, production of tempeh is historically with soybean. The aim of this study was to explore the FODMAP-reducing effects of selected fungi on faba bean and pea and their microbial community dynamics during tempeh production.

METHODS

Faba bean (*Vicia faba*) and pea (*Pisum sativum*) were dehulled and soaked for 18 hours in 0.5% lactic acid and steam-cooked at 100°C for 25 (faba) and 60 minutes (pea). Once cooled, legumes were inoculated with 1ml spore solution (1x10^4 spores/ml/g) of either *R. oligosporus* (NRRL 5905), *R. oligosporus* (NRRL 2710) and/or *R. oryzae* (CCUG 61147), and *A. oryzae* (NRRL 2217). Tempeh was incubated at 28°C and harvested at 30 and 48 hours. Samples were stored at -20°C and freeze-dried. Selected FODMAPs were quantified using HPAEC-PAD and microbial communities were characterised using 16S rRNA gene and ITS amplicon sequencing. Data were statistically analysed using R software.

RESULTS

Faba and pea tempeh were produced with all strain inoculations. Both *R. oligosporus* (NRRL 5905; NRRL 2710) strains combined produced the most aesthetic pea and faba tempeh at 30 hours, whilst *R. oryzae* (CCUG 61147) produced tempeh mostly at 48 hours, albeit inconsistently in pea and with dense sporulation in faba. *R. oligosporus* (NRRL 2710) co-inoculated with *A. oryzae* (NRRL 2217) had the greatest degradation effect on total selected FODMAPs at 30 hours in both faba (-58.8%) and pea (-73.8%) compared to pre-inoculation levels. At 48 hours, *R. oligosporus* (NRRL 2710) with *A. oryzae* (NRRL 2217) decreased RFOs by -100% in faba and -96.7% in pea.

CONCLUSIONS

Finnish-grown faba bean and pea are suitable substrates for tempeh production. Co-inoculating tempeh with *A. oryzae* enhances the degradation effect of FODMAPs proving a possible solution for individuals sensitive to gut symptoms by plant foods.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP19_11

CONSUMPTION OF DIETARY FIBRE, FRUITS AND VEGETABLES, AND FISH, IS ASSOCIATED WITH GREATER FOOD BIODIVERSITY IN UK DIETS

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BACKGROUND AND OBJECTIVES

Dietary species richness (DSR), a metric of food diversity, has been inversely associated with total and cause-specific mortality in European populations. We determined whether i) DSR can be robustly measured based on four-day food intake data, ii) DSR is associated with diet quality, and iii) DSR is dependent on socio-demographic characteristics.

METHODS

The NDNS nutrient databank 2018–2019, with data on nutrient composition, was expanded to include data on FoodEx2 food classification, ingredients, the number and identity of unique species, and greenhouse gas emissions. Four-day food intake data and data on age, sex, BMI, ethnicity, Index of Multiple Deprivation (IMD), and household income were obtained from the UK National Diet and Nutrition Survey (NDNS) waves 9–11 (years 2018 to 2019), to calculate dietary quality indicators and DSR on the food and diet level.

RESULTS

We identified 216 unique species across UK diets. On the food level, composite dishes had the highest DSR (median 8 [Q1=4, Q3=12]), followed by seasoning, sauces, and condiments (median 7, [Q1=4, Q3 =10]) and grains and grain-based products (median 5, [Q1=2, Q3=7]). On the dietary level, the median DSR over four days was 49 [Q1=43, Q3=56; range 14 - 92], with the first two days covering 80% of the total DSR measured over four days. DSR was significantly higher in younger age categories and those with a higher household income or higher IMD (all $p<0.001$). A higher DSR was significantly associated with a higher intake of dietary fibre, fruits and vegetables, and fish (all $p<0.001$).

CONCLUSIONS

We successfully established DSR in UK diets based on four-day food intake data. We also identified opportunities to increase DSR, for example, by increasing the consumption of fruits and vegetables, fibre, and fish, potentially through composite dishes. More research will be required to further validate the DSR, and to establish the relationships between DSR, individual health outcomes, personalised approaches to increase food biodiversity, and ecological biodiversity impact.

CONFLICTS OF INTERESTS

MD-K, EZ, and AW are employees of Unilever, a global FMCG company which produces and markets a variety of foods and beverages. The other authors report no conflict of interest.

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SOAP19_12

RECONFIGURING OF MEALS WITHOUT MEAT: IMPLICATIONS FOR THE NET REDUCTION IN GHG EMISSIONS AND HEALTHINESS

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BACKGROUND AND OBJECTIVES

High income populations are recommended to reduce their meat consumption for a more environmentally sustainable diet, especially ruminant meat. However, in isolation this recommendation is no guarantee that the environmental impact of diets will be smaller or healthier because foods are eaten within the context of meals and a wider diet. The objective was to examined the structure of meals with or without meat in them to understand the knock-on consequences of reducing meat for overall meal structures.

METHODS

The UK National Diet and Nutrition Surveys (2008-2019) were used to compare the composition of 51,890 meals from 9,189 adults (aged ≥16 years old). The composition of meat and non-meat meals were compared for the foods included in a meal. Logistic and gamma mixed models were constructed to quantify the likelihood and quantity of different foods in the meal respectively.

RESULTS

Meat was observed in 62.5% of evening and 48.7% of lunch meals. Vegetables were less likely to be included in non-meat evening meals (70.8%) compared to meals that did include meat (26.5%). The meat type was differentially associated with starch components ($p < 0.001$): compared to other meats, poultry was more likely consumed with rice, beef with pasta, bacon/ham and non-meat meals with bread. These starchy elements had significant impacts on the greenhouse gas emissions of meat meals, for example, switching from a beef to poultry evening meal, both with pasta would result in an average of a 35% reduction in emissions, whereas switching between the more popular combinations of beef with pasta to poultry with rice would only result in a 14% reduction in emissions on average.

CONCLUSIONS

Recommendations to reduce meat consumption and the estimated effect size of the environmental impacts must consider the wider consequences on the whole diet as meals will be restructured such that the net reduction in emissions or consumption of other healthy meal components may not be beneficial. Policies to encourage a reduction in meat consumption must avoid the unintended consequences of reducing vegetable consumption and need to account for the likely meal structures that are culturally appealing in the absence of meat to avoid meals that are worse for health or the environment.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP19_14

SUSTAINABLE NUTRITION FOR FARMED SALMON IN SUB-OPTIMUM ENVIRONMENTS DUE TO CLIMATE CHANGE

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BACKGROUND AND OBJECTIVES

Aquaculture of salmon species is one of the most valuable aquaculture industries and makes important contributions to the supply of nutritious food. However, salmon aquaculture faces significant challenges, including global climate change, decarbonization and being mainly located in heavily contested coastal regions. Moving salmon aquaculture offshore is being investigated around the world. The objective of the current research is to understand the impact of sub-optimum environmental conditions due to climate change on salmon nutrition.

METHODS

The first Australian offshore aquaculture research trial will contribute new knowledge about Atlantic salmon nutrition. In preparation, we have established a translational research program that has validated nutrition data gained from on-shore tanks by combining a selective breeding program with OMICS based nutrition research. For example, approximately 1200 seawater Atlantic salmon with known genetics and belonging to over 160 families were used. Salmon were exposed to a climate change scenario: a sub-optimum 10 week summer (elevated temperature and reduced dissolved oxygen) followed by an autumn recovery period. Standard nutrition analyses combined with proteomics and transcriptomics were used to identify and explain differences in salmon nutrition.

RESULTS

Using the same families and breeding cohort we showed sub-optimum climate change environments, genotype and salmon size impact salmon nutrition. Although the smaller salmon performed better, salmon at two sizes were resilient under sub-optimum conditions and recovered well (survival was high). Transcriptomic analysis uncovered significant differences in lipid metabolism. Proteomic analysis identified key differences in energy metabolism and protein turnover of larger salmon which, more than small salmon, showed significant energy reallocation to meet their increased energy demands.

CONCLUSIONS

Atlantic salmon families in Tasmania demonstrated a suitable range of performance in important traits that will underpin sustainable production under immediate climate change. Although smaller salmon were more robust than larger ones, the majority of larger individuals continued to feed, grow and recover. Thus, the current salmon stock has resilience across the seawater salmon production cycle. The translational approach adopted in the present research and new knowledge about mechanisms underpinning relative performance of different families provides further options to explore via selective breeding.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP19_15

DIETARY PROFILES IN THE FRENCH WEST INDIES: WHAT DO WE KNOW ABOUT THE EXPOSURE TO CHLORDECONE AND THEIR DIET MONETARY COSTS ?

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BACKGROUND AND OBJECTIVES

The French West Indies (FWI, Guadeloupe and Martinique) are facing a triple challenge: 90% of the population is exposed to chlordecone (CLD), an organochlorine pesticide that pollutes durably soils, water, and food products; increasing nutrition-related chronic diseases' rates related to unbalanced diet; and food choices constrained due to high food prices and low incomes for a large part of populations. Informal distribution channels (e.g.: self-production) may reduce the economic constraints for populations but may increase the risk of CLD exposure. In this context, our study assesses the diet monetary costs and CLD exposure of four current co-existing dietary patterns previously identified in the FWI: the "prudent" and "traditional" patterns, both with high global diet quality, the "convenient" pattern with the lowest diet quality and the "transitioning" one, with an intermediate diet quality (1, 2).

METHODS

Our study used data from the cross-sectional Kannari survey (2013–2014) conducted on 1,105 adults in FWI. Dietary intake was assessed using two 24-hour recalls and a food frequency questionnaire (FFQ). To estimate CLD exposure and the highly contributed foods (≥10% of the total exposure), we combined the frequency from FFQ with food contamination data from formal and informal distribution channels. Diet monetary costs were estimated based on food prices, distribution channels, and daily consumption. Kruskal-Wallis and Dunn-Bonferroni tests were used to compare CLD exposure and costs across patterns.

RESULTS

The "transitioning" pattern had the highest CLD exposure ($p<0.05$), with marine fish from roadside purchases and crustaceans from gifts as the highly contributed foods, while in other patterns, only crustaceans by gifts were identified as the main contributors. The "transitioning" pattern also had the highest diet monetary cost (4.80 €/day, $p<0.01$). Interestingly, there is no difference in cost between the "convenient" and "prudent" patterns (3.71 vs 4.34 €/day, $p=0.59$).

CONCLUSIONS

In the FWI, the "convenient" and "prudent" patterns were comparable in cost while opposite in diet quality (1), showing that food prices do not limit access to healthy diets. In addition, the "transitioning" pattern had the highest cost as well as the highest CLD exposure but a moderate diet quality suggesting that one public health action could be to help the transitioning population group (20% of the total population) shift towards a diet with lower risk in terms of CLD exposure and nutrition by promoting safer, nutritious, and affordable food options.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP19_17

WISEFOOD PROJECT: A PROTOCOL FOR UTILISING ARTIFICIAL INTELLIGENCE TO ENHANCE HEALTHY AND SUSTAINABLE HOUSEHOLD FOOD CHOICES

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BACKGROUND AND OBJECTIVES

The Horizon Europe WiseFood project addresses the pressing need for healthier and more sustainable dietary habits, aligned with global public health and environmental goals. By leveraging artificial intelligence (AI), WiseFood aims to empower households to make informed food choices. The project's primary objectives are to develop three applications—FoodScholar, RecipeWrangler, and FoodChat—and utilise Living Labs (LLs) to co-design and evaluate their impact on nutrition and sustainability at a household level.

METHODS

A scoping landscape analysis will synthesise existing AI solutions supporting healthy eating to inform the development of the three applications. Technical development will leverage Large Language Models (LLMs), data pre-processing, integration, and Retrieval-Augmented Generation (RAG) techniques to ensure access to domain-specific and up-to-date information. Mechanisms to enhance AI robustness and align outputs with national guidelines will be integral to the approach.

The WiseFood applications will be developed through stakeholder engagement, involving households, nutritionists, dietitians, and policymakers to ensure relevance and usability. Iterative co-design workshops will be conducted to gather diverse perspectives and refine the applications. An 8-week cohort study with 300 households across Ireland, Hungary, and Slovenia will evaluate the feasibility, acceptability, and usage of the applications. Key outcomes will be assessed using validated tools, including household level dietary assessments, the General Nutrition Knowledge Questionnaire (1) and the Food Environmental Impact Knowledge Questionnaire (2).

RESULTS

The scoping review of existing state-of-the-art solutions will inform the development and technical approaches used for WiseFood applications. Anticipated outcomes from the cohort study include feasibility metrics such as acceptability, retention, and user engagement, alongside improvements in nutrition and food environmental knowledge and dietary choices among participating households.

CONCLUSIONS

WiseFood integrates cutting-edge AI tools with participatory co-design METHODSto address barriers to healthy and sustainable eating. Its household-level approach aims to contribute significantly to global health and sustainability targets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 31 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

SOAP31_01

FOODWAYS THROUGH THE FOREST: WILD EDIBLE PLANTS IN MALAYSIA

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BACKGROUND AND OBJECTIVES

Micronutrient fortification and macronutrient supplementation have been vital in improving global health, saving millions of lives. In Malaysia, malnutrition, especially among indigenous populations, remains a pressing issue, highlighting the need for locally sourced nutritional solutions to combat malnutrition and reduce non-communicable disease (NCD) risks. Current food movements emphasize wild edible plants (WEPs) to revive traditional culinary practices and enhance nutrition. These WEPs are rich in essential micronutrients, fats, and amino acids, offering a promising way to address food shortages and promote dietary diversity among indigenous communities.

METHODS

This research seeks to document the nutritional and medicinal properties of WEPs utilized by marginalized ethnic minorities in Malaysia. An ethnobotanical survey was conducted among ethnic minority communities in Malaysia to gather data on commonly used wild edible plants (WEPs). Nutritional analyses were performed on five selected plants. These analyses aimed to evaluate the content of essential micronutrients and macronutrients in these plants.

RESULTS

The findings show several species showing high concentrations of both carbohydrate and protein that ranged from 1.5 to 6.2 g/100 g (carbohydrate) and 4.9 to 9.2 g/100 g (protein) respectively. The mineral analysis showed that these plants contain considerable calcium, iron, potassium, and magnesium content compared to commercial vegetables.

CONCLUSIONS

By documenting and promoting the use of wild edible plants (WEPs), this research aims to improve food security and nutrition among marginalized populations by increasing awareness to macronutrients and micronutrients found in these plants, as well as exploring ways to incorporate them into local diets. Additionally, it seeks to preserve traditional knowledge and advocate for the development of sustainable, community-based food systems.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP31_02

NUTRITION SENSITIVE AGRO-ECOLOGY

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BACKGROUND AND OBJECTIVES

Agroecology is a blueprint for sustainable food systems. Yet, only few empirical studies explore the links between agroecology and nutrition in Asia. Our research aims to assess whether agroecological practices are associated with agricultural biodiversity and dietary diversity in northern Laos.

METHODS

All women of reproductive age from 3 rural villages (n=220) were interviewed during the dry and wet season in 2024. Using open 24H-recalls, we computed the Minimum Dietary Diversity of Women (MDDW-10) (FAO, 2021) and the Non-Communicable Disease index, and we documented the supply sources of food consumed (production, purchases, free collection). Agroecological practices were assessed using indicators that refer to the Agroecology Assessment Framework (Agroecology Coalition, 2024). A structural equations model was used to provide a holistic analysis of the interplay between agroecology and nutrition.

RESULTS

Only 33% of women reached MDDW (3.9 +/-1.1 food groups in mean). Supply sources are complementary and not substitutable as they provide different food at different season. Specific agroecological practices are associated with greater diversity of production (as food groups produced) and higher women dietary diversity.

CONCLUSIONS

Identifying and supporting effective agroecological practices is essential for improving dietary diversity and strengthening the resilience of vulnerable populations in the context of climate change.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP31_03

"SUSTAINABLE DIETS: ARE CONSUMER REPRESENTATIONS AND FOOD CHOICE CRITERIA ALIGNED?"

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BACKGROUND AND OBJECTIVES

Adopting a more sustainable diet is crucial for the well-being of ecosystems and populations. While many consumers believe their diets are already sustainable, the transition towards truly sustainable diets remains challenging. This discrepancy between perceived and real diet sustainability raises questions: what do sustainable diets really mean for consumers? To what extent do their representations of sustainability align with their criteria when choosing sustainable food?

METHODS

To address these questions, a two-part study was conducted in France. In the first part, French people representations were explored through a free word association task using the inductor expression "sustainable diets" (n=273). After triangulation, categories of concepts associated to "sustainable diets" were identified. The second part of the study consisted in an online food choice intention task. 253 participants were divided into two groups and instructed to make everyday food choices (control group) or sustainable food choices among a set of 360 food products. These products were balanced in terms of origin, processing, packaging, label, and plant- versus animal-based origin. This allowed us to observe the criteria associated with sustainable food choices in participants' mind. The RESULTS of both studies were then compared to see if there are common features between consumers' representations of sustainable diets and their sustainable food choices criteria.

RESULTS

The RESULTS indicated that participants primarily associated the concepts of sustainable diet to ecology, health, and local origin of food. The criteria associated to sustainable food choices included high nutritional quality, local production, fair trade, minimal processing, and no use of plastic. Noticeably, plant-based or animal origin was barely mentioned in the word association task, and in the choice task, no change in the proportions of food categories was observed.

CONCLUSIONS

Thus, the representations participants have about sustainable diets and their selection criteria of sustainable diets were quite aligned in our study. However, these representations and criteria of choices reveal a partial and biased understanding of the concept of sustainable diets, which is associated to specific product characteristics, such as local origin or healthiness, rather than the substitution of animal-based options by plant-based ones, which is essential for a sustainable diet. Our RESULTS highlight that consumers still have a long way to go before adopting really sustainable eating practices.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP31_04

OPPORTUNITIES AND CHALLENGES POSED BY CLIMATE CHANGE IN THE UTILIZATION OF INDIGENOUS AND TRADITIONAL AFRICAN FOODS

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BACKGROUND AND OBJECTIVES

Indigenous African foods include foods obtained from indigenous and traditional crops and livestock. These foods have been utilized by Africans for a long time, and they are an integral part of their cultures and food systems. Climate change poses both opportunities and challenges in the utilization of these foods.

METHODS

A desk review of the opportunities and challenges posed by climate change on the utilization of tradititional and indigenous African foods was done. Search engines of Google Scholar, ResearchGate and Scopus were utilized, and the information filtered to retain relevant information for the article.

RESULTS

Climate change has adverse effects on food security in African countries. Prolonged droughts and frequent episodes of flooding result in loss of biodiversity, reducing the availability, production and utilization of traditional and indigenous African foods. Some of these foods are not cultivated or domesticated, but are obtained from the wild. Such foods include indigenous vegetables, fruits, mushrooms bush meat and insects. They are therefore more susceptible to loss of biodiversity and other vagaries of climate change. Decline in biodiversity is causing permanent loss of some of these foods. Government policies and mitigation measures in most African countries have often focused on the crops that were recently introduced, such as maize and rice, to the exclusion of indigenous crops. But climate change has also presented opportunities for promotion of the cultivation and increased utilization of indigenous and traditional African foods. Generally both traditional and indigenous crops are more tolerant to the local climatic conditions, including higher tolerance for drought conditions. They are also less susceptible to local diseases. Those that are cultivated have lower dependency on production inputs, such as fertilizer and pesticides. Hence they also have higher potential for production as organic foods, whose demand is increasing. There is also growing interest from mainstream research institutions and researchers on neglected and underutilized crops.

CONCLUSIONS

In conclusion, climate change poses challenges, including threat of extinction for some traditional and indigenous African foods that may lead to decreased utilization of these foods . But there are also promising opportunities for comparatively more sustainable production and utilization of these foods under climate change conditions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP31_05

IMPACT OF THE INCORPORATION OF ANIMAL- AND PLANT-ORIGIN OIL BODIES IN FOLLOW-ON FORMULAS ON LIPID AND PROTEIN DIGESTIBILITY

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BACKGROUND AND OBJECTIVES

Despite WHO recommendations, only 34% of infants are still breastfed at six months. Infant follow-on formulas (IFF) are widely used as a substitute for breast milk. The lipid fraction of IFF is typically based on a blend of refined vegetable oils obtained through solvent extraction that have a considerable environmental impact. Such process affect the structural organization of lipids within the matrix, consequently affecting their digestion. There is a current growing interest in the use of oil bodies (OB), such as oleosomes derived from oilseed crops. The present aim was to incorporate OB into IFF and evaluate their digestibility.

METHODS

IFF powders were produced with different fat sources: plant oils (PO), a mix of vegetable oils and animal-origin OB (PO/aOB), and a mix of plant- and animal-origin OB (pOB/aOB). The digestibility of rehydrated IFFs was assessed using a dynamic *in vitro* digestion system (DIDGI®, INRAE) with digestive parameters set to mimic the physiological conditions of a six-month-old infant.

RESULTS

All IFF had a standardized lipid content of 33 g.L-1 of reconstituted formula. However, their fatty acid profiles differed due to the bovine-origin OB (dairy cream), which introduced short-chain saturated fatty acids absent in PO. The protein content was standardized, averaging 14 g.L-1 of reconstituted formula. However, their protein types varied, particularly in pOB/aOB, where 20% of total proteins came from the plant-origin OB mix. Confocal imaging showed relatively similar aggregated structures during the gastric phase for the three IFFs. However, particle size analysis of the digesta revealed different size distribution profiles along the gastric digestion, with differences reported for pOB/aOB IFF *vs.* the other IFFs without OB. Lipid and protein hydrolyses were also followed during the gastric and intestinal digestion, as well as vitamin E bioaccesssibility, with ongoing analyses.

CONCLUSIONS

The present study enabled the design of innovative IFF incorporating plant OB extracted through more sustainable processes, as well as the development of an *in vitro* digestion model mimicking a 6-month-old infant.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP31_06

THE IMPACT OF NEGATIVE FOOTPRINT ILLUSION AND FOOD FORM PERCEPTION ON SUSTAINABLE EATING BEHAVIORS

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BACKGROUND AND OBJECTIVES

The negative footprint illusion is a cognitive bias that occurs when adding perceived eco-friendly or healthy attributes to a product makes its total environmental impact appear lower than it actually is. This illusion plays a critical role in sustainable eating behaviors and carbon footprint assessments. This study aimed to investigate differences in carbon footprint estimates among three groups evaluating fast-food combinations and to examine the influence of food form on sustainable eating behaviors in two groups exposed to contrasting food presentation sequences.

METHODS

This experimental design study included 132 healthy adults (70.5% female, mean age 29.3 ± 8.7 years). Participants were divided into five groups: Groups 1, 2, and 3 assessed the carbon footprints of a cheeseburger, a cheeseburger with apple, and a cheeseburger with fries, respectively. Groups 4 and 5 evaluated food forms presented sequentially: one starting with a meat patty with bread and salad followed by a hamburger and the other vice versa. A questionnaire including demographic characteristics, the Behaviors Scale Towards Sustainable Nutrition (BSSN), and carbon footprint evaluation metric was applied to all participants. Data were analyzed using SPSS 24.0.

RESULTS

Carbon footprint estimates varied significantly across Groups 1, 2, and 3 ($p=0.001$). Group 2 had significantly lower estimates than Group 3 ($p=0.001$), highlighting the negative footprint illusion Group 2 also had the highest BSSN score (102.3 ± 18.05), while Group 3 had the lowest (88.1 ± 20.6). Groups 4 and 5 differed significantly in both carbon footprint perceptions, and BSSN scores ($p<0.001$, $p=0.022$, respectively). Food form and presentation order influenced perceptions, with Group 4 reporting higher scores than Group 5. A moderate positive correlation was found between BSSN scores and carbon footprint estimates ($r=0.347$, $p=0.012$).

CONCLUSIONS

The negative footprint illusion and food form perception affect carbon footprint assessments and sustainable behaviors. Sequential presentation of food forms alters participants' perceptions, suggesting the importance of context in dietary education and policy interventions. These findings highlight the need for targeted strategies to bridge the gap between sustainable attitudes and behaviors.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP31_07

THE EFFECT OF FORTIFICATION ON IN VITRO IRON AND ZINC BIOAVAILABILITY IN PLANT-BASED MEAT ALTERNATIVES

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BACKGROUND AND OBJECTIVES

Plant-based diets are increasingly popular due to their perceived health benefits and positive environmental impact. However, there are concerns that long-term adherence to plant-based diets could result in nutritional deficiencies, especially for minerals found in abundance in animal foods. Therefore, plant-based meat substitutes may be a vehicle for fortification to provide a source of bioavailable minerals. This study investigated the iron (Fe), zinc (Zn) and calcium (Ca) content and bioavailability from unfortified and Fe and/or Zn fortified plant-based mince (PBM) compared with animal mince.

METHODS

Total and bioaccessible mineral levels in animal mince, and PBM were determined using microwave digestion and in vitro simulated gastrointestinal digestion, respectively. Mineral bioavailability was assessed by exposure of Caco-2 cells to the digested food samples and measuring mineral uptake into the cells using Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Total phytate levels were measured to calculate the phytic acid:mineral molar ratio (PA:Fe, PA:Zn, PA:Ca) as indication of the mineral bioavailability.

RESULTS

Fe bioavailability from animal mince was significantly greater than from unfortified PBM. Fortification of PBM with Fe reduced the PA:Fe molar ratio to below 10, and increased Fe bioavailability compared with the unfortified PBM. Total Fe uptake from fortified PBM was equivalent to that from animal mince. Following fortification of PBM with Zn, the PA:Zn ratio remained high (>14), and bioavailability was not enhanced compared with the unfortified PBM ($P>0.1$).

CONCLUSIONS

This study highlights that Fe-fortified PBM can improve Fe bioavailability and provide similar amounts of Fe compared to beef mince, whereas more research is needed for Zn fortification of PBM. Fortification can be a promising approach to reduce the phytic acid:mineral molar ratio to mitigate the inhibitory effect of phytic acid on mineral bioavailability.

CONFLICTS OF INTERESTS

TB, AE and AW are employees of Unilever, a global FMCG company which produces and markets foods and beverages including plant-based meat alternatives

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SOAP31_08

IN VITRO HUMAN GASTROINTESTINAL DIGESTIBILITY AND COLONIC FERMENTATION OF WHEY, CASEIN AND EDIBLE YEAST-BASED PROTEINS

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BACKGROUND AND OBJECTIVES

Transitioning food systems and in particular human protein consumption away from animal-based, carbon- and resource-intensive proteins to more sustainable sources has become a major topic for nutritional research community. On top of plant-based proteins, with fermentation technology, yeast-based proteins (YBP) could represent plausible alternative protein sources with high nutritional quality and with lower environmental impact. Herein we propose to study YBP nutritional profile, digestibility and metabolic response. YBP was compared with whey and casein as reference animal proteins.

METHODS

A 5-hour in vitro simulated human digestion model was used to assess the digestibility and amino acid bio-accessibility of three independent YBP production batches with commercial whey and casein references. Dialysate and ileal effluent samples were collected hourly, then total nitrogen and free amino acids were quantified. We also evaluated the impact of the 3 sources of proteins digestates on human colonic microbial communities upon 48-hour Colon-on-a-Plate batch fermentation with faecal samples from 11 healthy donors. The microbial activity and composition were analysed by untargeted metabolomics and shotgun sequencing respectively.

RESULTS

The RESULTS showed that YBP, casein, and whey were comparable in terms of digestibility. Although YBP exhibited a different metabolomic fingerprint compared to casein and whey, the microbial activity, as measured by short chain fatty acid quantification, was significantly increased for all protein sources compared to the blank, with no significant difference between protein sources. Whey and casein resulted in a higher or lower abundance of certain bacterial taxa (8-times more *Clostridium phoceensis* and 8-times less *Bacteroides*) compared to YBP.

CONCLUSIONS

Overall, our in vitro data simulating human digestion suggests that YBP could be a relevant alternative to animal protein. While in vitro studies cannot fully replicate the complexity of in vivo digestion, they serve as useful alternatives to animal models for assessing human protein digestibility. Thus, further clinical follow-up studies are now warranted.

CONFLICTS OF INTERESTS

All authors are or were employed by Lesaffre International

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SOAP31_09

OPPORTUNITIES AND CHALLENGES OF AGROECOLOGICAL FOOD MARKETS TO ADDRESS URBAN MALNUTRITION: A CASE STUDY IN DAKAR, SENEGAL

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BACKGROUND AND OBJECTIVES

Agroecology is a holistic approach that draws on ecological and social justice principles with potential to transform food systems (FS) towards improved health and sustainability. While there is evidence that agroecological practices can improve food security and nutrition for farming households, there is less evidence in urban areas, particularly for low-income households. This study examines potential pathways of agroecological FS interventions on nutrition in urban areas, based on a literature review and an exploratory case study.

METHODS

Senegal was chosen due to the prevalence of malnutrition, and the dynamic civil society in support of agroecology, including for domestic markets. Three market locations were selected in Dakar and Thiès, based on the following criteria: urban or peri urban, agroecological food products sold, including fruits or vegetables, low-income consumers. Semi-structured interviews (n=40) were carried out with actors involved in agroecological food markets, including consumers, farmers, market vendors and development partners. Three focus groups and a survey with 120 women consumers were carried out.

RESULTS

The findings show the importance of affordability, market location, regular supply of produce, and public sensitization to overcome the perception that agroecology is reserved for the better-off. Health, food safety and quality are the main motivations for people to engage in the initiatives, whether they are consumers, vendors or farmers. In the absence of certification, these channels echo the connectivity principle of agroecology, building on short distribution networks and direct communication between consumers and vendors (who might also be farmers), as well as sharing values and knowledge around food and health. Trust is at the core of the relationship, which depends on vendors' capacity to genuinely respond to consumers' concerns. The survey will enable us to characterize the place of agroecological foods in urban diets and what factors increase consumption of agroecological products.

CONCLUSIONS

The study addresses research gaps on the agroecology – nutrition nexus and contributes to the agenda on sustainable and healthy diets by exploring the conditions under which agroecological FS could improve food behaviours and diets of economically and nutritionally vulnerable women in cities. The research considers the tension within agroecological approaches which seek to provide decent livelihoods to farmers while provisioning affordable healthy food for consumers on a regular basis, and emphasizes the place of trust, information and value-sharing in building agroecological FS with potential for nutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP31_10

COMBINING NUTRITIONAL VALUE WITH ENVIRONMENTAL IMPACT: A NOVEL APPROACH TO NUTRITIONAL LIFE CYCLE ASSESSMENT (NLCA)

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BACKGROUND AND OBJECTIVES

In nutritional life cycle assessment (nLCA) nutrient provision is the key function of foods. This warrants replacing the traditional mass-based functional unit (FU) in LCA by a nutrient-based FU. However, such replacement causes several methodological issues and there is at present no uniform approach for integrating nutritional value into the FU of LCA. We propose a novel approach where the mass-based FU is adjusted for nutritional value, i.e., nLCA = LCA / nutritional value.

METHODS

To demonstrate our approach, we calculated the nLCA for 164 food items from the Dutch environmental impact database of foods (by RIVM). We used global warming potential (GWP, in kg CO2 eq/kg) as indicator of environmental impact. As a measure of nutritional value, we used the Qualifying Index (QI), a dimensionless, numerical value expressing the relation between nutrient density and energy density of a food. To calculate the QI we selected 21 qualifying nutrients, based on their contribution to the overall Dutch dietary intake. All QIs were calculated with and without capping to assess the influence of high nutrient levels and weighting was applied to calculate food-group-specific QIs.

RESULTS

For the majority of foods, the calculated QI was above 1, with higher values of QI representing higher nutrient density. The highest QI values were observed for vegetables and fish, whereas the lowest QI values were observed for fats, oils and grain products. GWP values were highest for protein foods and lowest for fruits, vegetables and grain products. For most foods, GWP decreased after nutritional adjustment, as their QI-values were >1. Most discretionary foods have QI values below 1 and, consequently, higher nutrient-adjusted GWP values. Food-group-specific weighting led to QI-values more in line with actual nutritional values and, accordingly, more distinctive GWP values. Additional analysis showed that the QI-nLCA methodology can be applied to compare individual foods, as well as meals and diets.

CONCLUSIONS

This study introduces a novel approach to nLCA, in which the original mass-based FU is corrected for by the QI, a numerical value expressing the relation between nutrient density and energy density of a food. This QI-nLCA enables a more comprehensive evaluation of foods, meals and diets. It can be applied to different environmental indicators and, as such, could add to evidence-based decision-making by policy makers in the field of healthy and sustainable nutrition.

CONFLICTS OF INTERESTS

S.P. is employed at the Dutch Dairy Association and O.L, J.G. and T.H. are employed at companies that are member of the Dutch Dairy Association. M.v.E. is an independent consultant at Buro Vlinder. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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SOAP31_11

PROTEIN DIGESTIBILITY, DIAAS AND ENVIRONMENTAL IMPACTS OF SOY-BASED MEAT ALTERNATIVES: THE EFFECT OF DIFFERENT PROCESSING OPERATIONS

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BACKGROUND AND OBJECTIVES

Soybeans (*Glycine max*) are a versatile legume, being also widely used to produce meat alternatives. Limited data exists on the effect of well-defined food processing operations on protein digestibility and production linked environmental impact.

METHODS

We produced soy-based meat alternatives starting from “Protéix” soybeans and from a commercial soy protein concentrate (SPC, Alpha-8). Beans were de-hulled and fat extracted to partly defatted soy flakes (SWF), and further processed to SPC and soy protein isolate (SPI) at pilot scale. Each intermediate product was extruded with both low and high mechanical energy input and low and high moisture, respectively. *In vitro* digestion was conducted with the harmonized static INFOGEST protocol followed by in vitro assessment of protein quality and indispensable amino acid score (DIAAS) using the recommended amino acid pattern for 0.5–3 years old humans. An LCA with mass- and protein-based functional units (FUs) was conducted for SWF, SPC, SPI and their respective extrudates.

RESULTS

Digestibility increased with increasing degree of processing: with SWF (49.6%), SPC (55.5%) and SPI (92.3%) having increased digestibility. Extruded products from beans (SWF, SPC and SPI) or commercial SPC all had high (>95%) protein digestibility and DIAAS classified as “good” (DIAAS=75-99). Based on mass, the impacts are highest for SPI, followed by SPC, and SWF for both the ingredients and the extrudates. However, protein-based FUs can significantly alter the RESULTS.

CONCLUSIONS

Meat alternatives produced from soy have high protein digestibility and DIAAS consistent with a good quality protein source, and this is not markedly affected by extrusion processing parameters. When assessing the environmental impacts, the choice of FU is highly relevant.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP31_13

SOURCES OF PROTEIN, CALCIUM, ZINC, IODINE, AND VITAMIN B12 IN UK ADULTS FOLLOWING CONTEMPORARY VEGETARIAN AND VEGAN DIETS: FINDINGS FROM FEED

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BACKGROUND AND OBJECTIVES

Large differences in nutrient intakes have often been observed between adults consuming plant-based diets and those consuming diets containing meat and fish, highlighting protein, calcium, zinc, iodine, and vitamin B12 as nutrients of potential concern for vegetarians and vegans; we examined dietary sources of nutrient intakes in UK adults following these diets.

METHODS

Adults from across the UK were recruited into the Feeding the Future (FEED) study between February 2022 and December 2023. The cohort comprised 1562 self-defined omnivores, 1349 flexitarians, 568 pescatarians, 1292 vegetarians, and 1571 vegans who completed the online survey, providing detailed information on diet using a food frequency questionnaire. We calculated the percentage contributions of individual foods and drinks to daily protein, calcium, zinc, iodine, and vitamin B12 intakes in vegetarians and vegans. We also conducted a sex and energy adjusted regression analysis using the least absolute shrinkage and selection operator (LASSO) to identify top dietary contributors to these nutrients from all foods consumed.

RESULTS

The top contributors to protein were eggs in vegetarians (accounting for 5.4% of total protein intake) and wholemeal bread in vegans (5.4%). The largest proportion of calcium came from cheese in vegetarians (7.5%) and tofu in vegans (11.7%). The leading sources of iodine were semi-skimmed milk in vegetarians (11.6%) and soya milk in vegans (17.3%). The largest single sources of zinc were mycroprotein in vegetarians (8.0%) and nuts in vegans (6.5%). Semi-skimmed milk was the top contributor to vitamin B12 in vegetarians (14.2%) and yeast extract was the top source for vegans (27.5%). The leading contributors selected through LASSO regression were semi-skimmed milk for calcium, and yeast extract for vitamin B12, in vegetarians who consumed these foods. Among vegans, LASSO identified pea-protein shakes as a high contributor to protein intake, soya milk for calcium intake and mycroprotein for zinc intake.

CONCLUSIONS

In this large cohort of UK adults consuming contemporary diets, dairy products and eggs were major sources of protein, calcium, iodine, and vitamin B12 in vegetarians. In vegans, fortified products including bread, tofu, yeast extract, and plant-based milks were the leading sources of calcium, iodine and vitamin B12, and these foods were also important contributors to protein intake. Plant protein alternatives were also identified as significant contributors to protein and zinc intakes for vegetarians and vegans.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP31_15

HOW CLIMATE CHANGE IS ACCELERATING THE GLOBAL NUTRITION TRANSITION TO ULTRAPROCESSED FOODS AND CHRONIC DISEASE: A CONCEPTUAL FRAMEWORK

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BACKGROUND AND OBJECTIVES

Over the last fifty years, the nutrition transition has transformed global diets, shifting much of the world's population to diets high in sweetened beverages (SSBs) and ultraprocessed foods (UPFs), driving rapid increases in obesity and related chronic diseases, particularly in low-and-middle-income countries. Simultaneously, climate and environmental change (CEC) have caused more frequent food supply disruptions, while the food industry's aggressive promotion of SSBs and UPFs have driven further health and CEC harms. These processes necessitate a complex conceptual model to guide research and policy, but previous models have not fully captured all elements. This study creates a model for the "climate-nutrition" transition and role of the food industry in exacerbating harms across dimensions.

METHODS

This narrative review combines a review of existing literature, global data on CEC events, global sales data on SSBs and UPFs, and illustrative case studies from low-and-middle income countries. We develop a conceptual framework based on the socio-ecological model, commercial determinants of health, and the nutrition transition to reflect the multi-directional relationship between CEC, diets, health, and the food industry.

RESULTS

Our new "climate-nutrition" transition model shows how CEC, including temperature increases, drought, extreme heat, and other events, disrupt food and water systems, increasing water insecurity and reducing the availability, affordability, and ability to prepare fresh and minimally processed foods. These events, coupled with food industry promotion of SSBs and UPFs through multi-pronged, aggressive, and increasingly personalized digital-based tactics, reduce intake of water and fresh and minimally processed foods while increasing reliance on packaged, shelf-stable products like SSBs and UPFs. These shifts increase chronic disease risk and increase CEC harms, including water overuse, plastic pollution, greenhouse gas emissions, and biodiversity loss. CEC also exacerbates chronic disease morbidity through multiple biological pathways (e.g., increased risk of heat stroke for people with hypertension). Case studies show how the food industry exploits CEC to promote its products (e.g., heat-wave-based ads for sugary drinks in Bangladesh, CEC-related food aid promoting sugary drinks in South Africa). The model shows how mandatory governmental policy action is the critical lever for halting this "climate-nutrition" transition.

CONCLUSIONS

CEC is accelerating the transition to SSBs and UPFs. Policy action is urgently needed to address the triple crisis of climate change, chronic disease, and food industry exploitation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP31_16

NUTRITIONAL AND CLIMATE-SMART FORMULATION OF GLUTEN-FREE COMPOSITE PASTA BASED ON LEGUMES, CEREALS AND LEAFY VEGETABLES GROWN IN AFRICAN COUNTRIES: FROM THEORETICAL DESIGN USING LINEAR PROGRAMMING TO SENSORY VALIDATION

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BACKGROUND AND OBJECTIVES

Ecological and nutritional challenges are driving us towards the use of climate-smart crops and the nutritional optimization of staple foods. The European Innofood Africa project aimed to address these challenges by developing the production, processing and consumption of African climate-smart crops. In this project, our objective was to develop nutritionally optimized pasta made from gluten-free wholegrain flours (legumes, cereals and other nutritious climate-smart crops) for European and African adults, to assess their acceptability and theoretical impact on meeting nutritional recommendations in 4 African countries.

METHODS

Pasta nutritional optimization was achieved using linear programming to meet the FAO's recommendations for essential macro- and micronutrients for adults, particularly women, in 1 meal (considering 3 meals/day). Pasta were produced by low temperature extrusion and drying, without additive, to preserve nutritional quality. Starch and protein *in vitro* digestibility, sensory evaluation and theoretical impact of their consumption on the capacity of African diet to cover nutritional needs was evaluated by replacing 25, 50 or 100% of the cereal food with these pasta in the baseline diet (based on a consumption survey in Kenya, Ethiopia, Uganda and South Africa conducted during Innofood Africa project).

RESULTS

Four gluten-free nutritionally optimized pasta were developed, all based on cowpea, with or without teff and/or amaranth leaves. The consumption of a portion of cooked pasta (100g of dry pasta) allowed to meet the FAO recommendations for protein, fibers, iron, zinc, B9 vitamin, and beta-carotene (for pasta containing amaranth leaves). All cowpea-based pasta had a low GI, protein digestibility similar to classical wheat pasta, and a higher protein quality (2 times higher PDCAAS due balanced essential amino acids). Consuming between 12.5 and 100g of cooked pasta helped meet zinc and iron recommendations in Kenya and Uganda, and allowed to meet vitamin A recommendation in South Africa. Cowpea-based pasta were found to be acceptable.

CONCLUSIONS

Nutritional optimization of pasta through formulation by linear programming can help help populations meet recommendations in key nutrients. Replacing durum wheat semolina entirely with gluten-free climate-smart crops (cowpea, teff and amaranth leaf flours), remained them acceptable to consumers and provided nutritional benefits without compromising their low glycemic index.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 34 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

SOAP34_01

A COMPARISON OF U.S. FEDERAL INFANT FEEDING POLICY CHANGES TO THE GLOBAL BREASTFEEDING COLLECTIVE'S POLICY RECOMMENDATIONS: IMPLICATIONS FOR PUBLIC HEALTH, CLIMATE, AND FOOD SYSTEM SUSTAINABILITY

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BACKGROUND AND OBJECTIVES

The contribution of infant feeding to food system sustainability is an emerging are of research and policy. The Global Breastfeeding Collective (GBC) provides a set of policy priorities for countries to promote, protect and support breastfeeding and uses country scorecards to document progress toward meeting global objectives. The United States (U.S.) participates in the GBC. Previous research has documented that U.S. policies unevenly protect and support breastfeeding as a public health priority. This study assessed how U.S. federal infant feeding policy changes in legislation, regulation, and executive level presidential documents align with the GBC's policy recommendations and opportunities to promote sustainability links.

METHODS

Four online databases were used to identify policy changes in U.S. federal infant feeding legislation, regulation, and presidential documents between 2014-2023. This time-period overlapped with the COVID-19 pandemic and the 2022 U.S. infant formula shortage. Policies were coded by GBC priority topic areas.

RESULTS

Fifty-seven infant feeding policy changes between 2014- 2023 were identified. Of these, only 17 included an infant feeding policy change that aligned with at least one of the of the GBC policy priority topics. Most infant feeding policy changes (49) did not match GBC policy priorities. Nine policies had changes across both GBC and non-GBC policy topics. Non-GBC policy changes included infant formula, public non-workplace lactation spaces, and breastfeeding supplies.

CONCLUSIONS

Most changes to U.S. infant feeding policies related to infant formula. The lack of alignment between U.S. infant feeding policy changes and GBC policy recommendations suggests missed policy opportunities to support U.S. families across public health, climate, and food system sustainability objectives. However, promising policy changes outside of, but adjacent to, GBC priorities to strengthen breastfeeding were identified and could be considered for future GBC recommendations.

CONFLICTS OF INTERESTS
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SOAP34_02

ALIGNMENT BETWEEN HEALTHINESS AND ENVIRONMENTAL IMPACT OF PACKAGED FOOD PRODUCTS

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BACKGROUND AND OBJECTIVES

The food system is a major contributor to both rising global temperatures and the growing prevalence of chronic disease. Identifying foods that are unhealthy and have a high environmental impact is especially important for creating future sustainable food systems. There is limited research examining both the healthiness and environmental impact of food categories. This study sought to (i) assess alignment between healthiness and environmental impact across 16 packaged food categories and (ii) identify the food categories with a high proportion of foods that are both unhealthy and detrimental to the environment.

METHODS

Data were sourced from a database that included ~25,000 packaged food products from four Australian supermarket retailers. The Australian Health Star Rating and an estimation of greenhouse gas emissions (the recently developed 'Planetary Health Rating') were used. These measures were converted into binary indicators for the purposes of this study. Foods were considered (i) 'unhealthy' if they scored a Health Star Rating of <3.5 and 'healthy' if they scored ≥3.5; and (ii) to have 'high' environmental impact if they had a Planetary Health Rating of <3.5 and 'low' environmental impact if ≥3.5.

RESULTS

Around 20% of food and beverage products were classified as both healthy and low environmental impact. By comparison, 35% of products were classified as both unhealthy and high environmental impact. The food categories of *Confectionary* (80%), *Sugars, honey, and related products* (60%), and *Meat and meat alternatives* and *Snack foods* (both 55%) had especially high proportions of foods that were both unhealthy and had high environmental impact.

CONCLUSIONS

These RESULTS provide insights into the types of food products, especially those that are characterised by both low nutritional quality and high environmental impact, that could have fiscal and marketing policies applied to reduce consumption and production to optimise outcomes for people and the planet.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP34_3

PERCEPTIONS AROUND FOOD ENVIRONMENT AND DIETARY DIVERSITY OF RURAL COMMUNITIES OF CHHATTISGARH, INDIA

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BACKGROUND AND OBJECTIVES

Food environment, critical in shaping food choices (4-6), is undergoing transition and evolving dietary patterns are leading to poor dietary habits (7-9). Understanding food environments can inform interventions aimed at improving diet quality (10). This study aimed to assess perceptions around household food environment and dietary diversity among rural women belonging to Chhattisgarh, India.

METHODS

A cross-sectional study was conducted in 16 randomly selected hamlets (small clusters of households (HHs) within a village) across four administrative blocks of Sarguja district in Chhattisgarh. Data from HHs were collected on socio-demographic profile, perception around food environment (n=321), and dietary diversity of women of reproductive age (WRA) (n=320). Lived experience and perception on food environment was assessed using food environment profiling questionnaire; and a digital tool based on Minimum Dietary Diversity for Women (11) was used to assess dietary diversity (24-hour recall). Food Access Diversity Index (FADI) was calculated to assess variety of food accessed by HHs from natural sources.

RESULTS

Agriculture was the predominant occupation (81%), with most HHs (85%) accessing food from three to six sources, primarily government food programs (98%), local markets (97%), farmland (88%), kitchen gardens (74%), forests/open fields (33%). Paddy, wheat, pulses and maize were majorly grown crops in farmlands and green leafy vegetables, other vegetables and potatoes in kitchen gardens. Concerns around food quality (pesticide, chemical use, contamination and adulteration) were raised by almost half HHs. HHs indicated affordability constraints limiting market access for procurement of pulses, nuts, oils, vegetables and animal foods. Most were worried about declining interest in traditional foods among younger generations (81%) and indicated greater access to packaged foods (82%). Mean FADI of 0.28 ± 0.27 indicated low diversity in production and access to natural food sources. Mean DDS of women (3.65 ± 1.09) was low, with only one-fifth having an acceptable score of ≥5.

CONCLUSIONS

Despite diverse food sources, dietary diversity remains low. Differential perceptions regarding food environment in terms of access, availability, convenience, affordability and quality exist. Tailored, contextual messages that create value for traditional food while being cognisant of food access sources and preferences can be an important strategy to improve dietary quality and nutritional status of the community.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP34_04

IS CULTURED CHICKEN MEAT A NUTRITIONAL ANALOG TO CONVENTIONAL MEAT?

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BACKGROUND AND OBJECTIVES

There is increasing interest in cultured meat technology. Cultured chicken meat (CCM) received approval in the United States in 2023, while an application to approve cultured foie gras was submitted in 2024 to the European Food Safety Authority. This study aimed to re-evaluate the nutritional value and safety of US-authorized CCM and confront it with European Union recommendations and the quality of conventional chicken meat.

METHODS

The study drew on data delivered to the US Food and Drug Administration by one US-based manufacturer of CCM and compared them to various nutritional and safety thresholds implemented in the European Union.

RESULTS

Comparing to conventional chicken meat, serum-free CCM revealed a lower content of protein, most indispensable amino acids, Mg, and vitamin B3. Yet, we observed higher levels of fat, saturated fatty acids, cholesterol, vitamins B5, B6, and A, and minerals Ca, Cu, Fe, K, Mn, Na, P, Se, and Zn. Toxic elements (As, Cd, Pb, Hg) fell within allowance thresholds, albeit serum-free CCM had higher levels of Cd and Pb than conventional chicken meat. Similar, inferior shifts to conventional meat were observed for serum-based CCM. Generally, the present study indicated that CCM meets the requirements of the European Union. However, it is vital to streamline the reproducibility of the manufacturing process due to observed variabilities in nutrient levels among tested lots. At the same time, analyzed data lacked tests of vitamin C, E, K, B1, B2, B4, and B12 levels to provide a comprehensive assessment.

CONCLUSIONS

This study shows some advantages but also shortcomings of the analyzed CCM. One should note that this study represents a re-evaluation of CCM offered by a single producer, and as long as the presented analysis extends the understanding of the nutritional quality of these cutting-edge food products, it should not be extrapolated to the entire field of cultured meat.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP34_05

CO-CREATION APPROACHES TO INFORM SUSTAINABLE SCHOOL FOOD PROGRAM IMPLEMENTATION, EVALUATION, AND MONITORING PRACTICES

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BACKGROUND AND OBJECTIVES

In 2024, the Canadian federal government committed $1 billion to implement a national School Food Program (SFP) aimed at ensuring more equitable access to nutritious food for children nationwide, addressing the present ad hoc nature of SFPs. However, evidence on key performance indicators for a sustainable and successful SFP strategy in Canada is lacking. Historically, Canadian school food policies that lacked evidence-informed evaluation and stakeholder perspectives have shown poor uptake, limited implementation and low sustainability. Building on previous research on SFP Coordinator perspectives, this study engaged key stakeholders within Canada's largest and most diverse school board in a co-creation initiative to assess and compare SFP strategies, incorporate school-level perspectives, and address gaps in evidence.

METHODS

Using a co-creation research design embedded within the RE-AIM and socio-ecological health promotion frameworks, this study leveraged critical stakeholder partnerships to enhance evidence gathering on sustainable SFP strategies in Canada. The research team collaborated with the school board’s Nutrition Liaison Officers (NLOs) to co-create a methodology to assess and compare the school level SFP practices and opportunities for long-term program resilience. This methodology was further refined through engagement with the school board's research committee and community partners, such as non-profit school food organizations and public health units, who provided insight on evaluation criteria.

RESULTS

Co-creation activities resulted in: 1) formation of a Project Advisory Committee (PAC) comprising the research team, school board research committee, an executive superintendent, the NLOs, principals, teachers, and SFP Coordinators, and 2) successful completion of a pilot in June 2024, which informed contextual adaptations for the full study. The PAC facilitated the incorporation of diverse perspectives on program strategies, reflecting the realities of school-level operations and challenges in embedding sustainable practices into SFPs, and identified key indicator variables for evaluation and monitoring.

CONCLUSIONS

This co-creation approach highlights the importance of integrating lived experiences and diverse expertise within the school and community to evaluate and design SFPs that are sustainable and equitable. These efforts align with global goals for health equity and resilience, contributing to advancement of sustainable food systems.

CONFLICTS OF INTERESTS

This research is a part of the Feeding Kids, Nourishing Minds project, which is funded by the Joannah and Brian Lawson Centre for Child Nutrition, University of Toronto and the unrestricted donation from the President’s Choice Children’s Charity. PCCC had no role or input in any aspect of the research project. The authors had no financial relationships with any organizations that might have an interest in the presented work in the previous five years; no other relationships or activities that could appear to have influenced the presented work.

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SOAP34_06

SHIFTING PROTEIN CHOICES ON AMERICA'S PLATES: INSIGHTS FROM NATIONAL SURVEYS ON REPLACING RED MEAT WITH LEGUMES AND FISH

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BACKGROUND AND OBJECTIVES

Transitioning away from excess red meat consumption to increased intake of more sustainable alternatives is vital for lowering the environmental footprint of our food system and improving health. The objective of this study was to identify opportunities to increase the consumption of legumes and fish to help support a protein transition in line with health, sustainability and climate goals.

METHODS

A nationally representative survey was administered online in English and Spanish through the IPSOS-KnowledgePanel platform with (n=1020) respondents in the United States. The survey included questions about food preferences, barriers to consumption, dietary motivations, and willingness to shift dietary habits with a focus on legumes. Different messages to increase legume consumption were also tested. A similarly designed survey on sustainable seafood consumption will be administered in early 2025.

RESULTS

While only a third of the sample agreed with reported trying to make food and beverage choices that are good for the environment or for climate change, 80% were motivated by health concerns. Consumption of legumes was low, with 8.8% reporting never consuming them, 35.7% consuming them once a week or less, 40.6% consuming a few times a week, and 14.9% more frequently. However, 59% of participants expressed some interest in eating more. Primary reasons cited were increasing fiber intake (56.3%), eating healthier (49.3%), weight loss (32.3%), and reducing meat consumption (28.6%). Only 10.2% reported reducing the environmental footprint and 18.8% to lower costs as reasons to eat more legumes. Reported barriers to legume consumption included gas (25.4%), non-preferred taste (19.7%), and lack of knowledge about preparation METHODS(13.1%). Messaging related to lowered risk of diabetes and heart disease with increased consumption of legumes resonated with participants more than messaging about nutrients, sustainability, or recommended consumption frequency. When eating meals without meat, participants most often chose eggs (65.7%), seafood (61.6%), dairy (55.4%), and legumes (50.1%).

CONCLUSIONS

Efforts to promote sustainable food consumption patterns may be more successful through messaging related to health rather than climate change or sustainability messaging.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP34_08

CHARACTERIZING THE INDIGENOUS FOODS OF GARO TRIBAL COMMUNITY OF MEGHALAYA, INDIA

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BACKGROUND AND OBJECTIVES

Meghalaya, a biodiversity hotspot in India, supports vast array of flora and fauna [1]. Garo tribe, an indigenous community in Meghalaya, accesses wide diversity of foods [1]. Despite cultural importance of indigenous foods (IFs) among Garos, significant literature gap exists on their systematic documentation. A study was conducted among Garo tribe to characterize their IFs and explore factors influencing their access and consumption.

METHODS

Mixed method study conducted in 14 purposively selected villages of West Garo Hills district in Meghalaya. Focus group discussions (FGDs) and free-listing enquiries (n=14) captured information on IFs consumed, and factors affecting IF access and consumption. Based on transcripts, list was collated, including IFs known to community, their seasonality, habitat and saliency scores. Enlisted IFs were taxonomically identified through secondary review and verification by ethnobotanist. Additionally, registered rice lists were utilized to identify farmer registered local rice landraces. For identified IFs, nutritive values (NVs) were documented from secondary literature, while foods with no documented NVs were seasonally collected and sent to laboratory for nutrient analysis. Data analysis done in Atlas.ti.

RESULTS

FGDs revealed diverse list of 247 IFs, accessed from shifting cultivation (*Jhum*), farms, kitchen gardens, open spaces, forests, ponds/rivers, and markets. These foods comprised 88 cereals (35.6%), 4 pulses (1.6%), 35 green leafy vegetables (14.1%), 15 other vegetables (6.1%), 33 roots and tubers (13.4%), 20 fruits (8.1%), 7 mushrooms (2.8%), 41 flesh foods (16.5%), 4 seeds and condiments (1.6%). Among these, colocasia leaves (saliency score: 6.8), stream shrimp (6.5) and *Mi Sarengma* (local rice) (3.3) emerged as top-most salient foods. Till date, 69 IFs are taxonomically identified (44 from secondary review and 25 during fruiting and flowering season by ethnobotanist) and 29 farmer-registered indigenous rice varieties have been mapped from government rice gene pool registry. Documentation of NVs completed for 55 identified IFs, with most foods rich in iron, calcium, zinc and vitamin C. Despite Garo's rich traditional ecological knowledge, IF access is declining due to higher market dependence. Climate variation, reduced farm produce and changing *Jhum* landscape for commercial crop plantations cited as main reasons towards this shift.

CONCLUSIONS

Supportive policies needed to mitigate climate impacts and threats to Garo's traditional agroforestry systems, critical for sustaining agrobiodiversity and nutritional security.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP34_10

THE BENEFITS OF TRIPARTITE ASSOCIATIONS (CEREALS/LEGUMES/LEAFY VEGETABLES) IN ADULT AND CHILD NUTRITION: EXAMPLE OF APPLICATIONS IN TWO STAPLE CEREAL-BASED FOODS: PASTA AND INFANT FLOURS

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BACKGROUND AND OBJECTIVES

Despite the United Nations 2nd objective, malnutrition, in all its forms is rising. In 2022, WHO estimated that 2.5 billion adults over the age of 18 were overweight, while 9.2% of the world's population suffered from chronic hunger. Undernutrition affects children under five even more severely. Fighting against this double burden requires nutritional intervention and education policies combining several approaches. Nutritional optimization of staple foods based on locally-produced, climate-smart raw materials is one of them. Associating cereals and legumes chosen for their complementarity in essential amino acids and for their ω3 polyunsaturated fatty acid (PUFA) content, while minimizing their Anti-Nutritional Factors (ANF), is an effective strategy. These cereal/legume combinations can be enriched with leafy vegetables for additional fortification with iron, ω3 and antioxidants of interest.

METHODS

Tripartite cereal/legume/leafy vegetable combinations were determined by linear programming either to: i) meet the needs of adults in terms of protein, fiber, iron, zinc and vitamin B9, and then processed into pasta; or to ii) be suitable as complementary foods for children aged 6 to 24 months, and then produced in the form of Fortified Infant Flours (FIF). These matrices (after cooking) were subjected to an in vitro digestion procedure using the INFOGEST protocol (respectively adult model or 6-month-old child). The bioaccessibilities of proteins and starch (for pasta), and of lipids and proteins (for FIF) were characterized.

RESULTS

Four optimized pasta formulations were obtained from cowpea wholemeal flours with or without teff and/or Amaranth Leaf (AL), with i) a chemical score above 100, ii) a ω6/ω3 ratio below 5 and iii) coverage of the FAO nutritional recommendations for an adult. Compared with conventional wheat pasta (4% fiber), the optimized pasta (17% fiber) had the same or lower rapidly digestible starch, a good balance of essential amino acids and identical protein digestibility, despite higher levels of ANF. An optimized FIF (teff-wheat-soya flours based) fortified with DHA and ARA and added with 3% AL covered requirements in PUFAs (ω6/ω3=3.7), vitamins E, A and carotenoids. This FIF showed limited bioaccessibility of proteins and vitamin E, and good bioaccessibility of long-chain PUFAs.

CONCLUSIONS

Tripartite associations (cereals/legumes/leafy vegetables) optimized to cover the needs of adults or children are interesting for developing more plant-based, sustainable diets. These associations require in-depth biochemical characterization of the raw materials, of bioaccessibility of constituents and mastery of the manufacturing processes (even low tech).

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP34_11

ARE ULTRA-PROCESSED FOODS MORE AFFORDABLE? A COST COMPARISON OF ULTRA-PROCESSED AND NON-ULTRA-PROCESSED FOODS CONSUMED BY U.S. ADULTS

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BACKGROUND AND OBJECTIVES

Over half of the daily calories consumed by US adults came from ultra-processed foods (UPFs). The widespread of UPF consumption may be due, in part, to its low cost. We evaluated the cost of UPFs in comparison to non-UPFs consumed by US adults.

METHODS

By linking the dietary intake data collected using 24-hour diet recalls to the Purchase to Plate National Average Prices (PP-NAP) of foods purchased from grocery stores by US households, we estimated the cost ($ per 100 grams and $ per 100 kcal) of UPFs and non-UPFs, defined based on the Nova classification, among 4,669 US adults aged 20+ years who participated in the National Health and Nutrition Examination Survey Cycle 2017-2018. All analyses were adjusted for sampling weights to account for the complex sampling design and survey nonresponses.

RESULTS

Overall, UPFs had a higher mean (SE) cost per 100 grams ($0.50 ± 0.01 vs. $0.24 ± 0.01) but a lower mean cost per 100 kcal ($0.38 ± 0.02 vs. $0.60 ± 0.02) than non-UPFs. Excluding processed culinary ingredients (Nova 2), unprocessed or minimally processed foods (Nova 1) had the lowest cost per 100 grams ($0.30) but the highest cost per 100 kcals ($0.54); processed foods (Nova 3) had the highest cost per 100 grams ($0.60) and UPFs had the lowest cost per 100 kcal ($0.31). Among food subgroups, highly processed animal protein foods (fast-food or reconstituted meat, poultry or fish) or starchy vegetables (fast-food or prepared potato products) had a higher mean cost per 100 grams but a lower mean cost per 100 kcal than unprocessed animal protein foods (meat, poultry, fish, and eggs) or unprocessed starchy vegetables (roots and tubers). Highly processed dairy (flavored dairy foods) or industrially processed grains had a higher mean cost than unprocessed dairy (milk and plain yogurt) or unprocessed grains in both per 100 grams and 100 kcals.

CONCLUSIONS

UPFs are cheaper sources of calories than non-UPFs (per 100 kcals) in the American’s diet. However, UPFs are more expensive than non-UPFs by weight (per 100 grams). Unprocessed or minimally processed foods have the highest cost per 100 kcals but the lowest cost per 100 grams.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP34_13

CLIMATE CHANGE, URBANIZATION, AND OBESITY IN CHINA

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BACKGROUND AND OBJECTIVES

Climate change and urbanization are increasingly recognized as significant global factors that can impact public health. The objectives of this study are to examine the complex interactions among these factors and to inform strategies for addressing obesity, a global epidemic that contributes to an increased risk of many noncommunicable diseases.

METHODS

We analyzed data from 34,670 adults aged 20 and older who participated in the China Health and Nutrition Survey, an ongoing cohort study initiated in 1989 with follow-up through 2018. A 12-component urbanization index (with a maximum score of 110 points) was developed to measure urbanization levels in each community. Detailed diet and anthropometric data were collected from all participants. Weather data were obtained from a publicly available source. We employed generalized regression and logit models to explore the relationships between climate change, urbanization, and obesity.

RESULTS

In 2018, the average body mass index (BMI), prevalence of overweight and obesity, and average highest temperature were 24.3, 39.0%, and 87.9°F, respectively, compared to 21.7, 13.0%, and 84.5°F in 1989. A one-degree Fahrenheit increase in temperature was associated with a 2.7% higher likelihood of being overweight or obese (OR=1.27, 95% CI 1.023–1.032), an increase in BMI by 0.078 ($p < 0.0001$), and a reduction in physical activity by 8.3 minutes per week. Additionally, a 10-point increase in the urbanization index was linked to a 0.23°F rise in temperature.

CONCLUSIONS

Rising temperatures may contribute to an increased risk of overweight and obesity by reducing physical activity, while urbanization may exacerbate climate change. The interplay between climate change, urbanization, and obesity warrants further investigation.

CONFLICTS OF INTERESTS

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SOAP34_14

INDIGENOUS FOOD KNOWLEDGE, PERCEPTION AND UTILIZATION IN THE EASTERN CAPE, SOUTH AFRICA

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BACKGROUND AND OBJECTIVES

Indigenous foods have recently received worldwide attention due to their ability to contribute to higher-quality nutrition, more sustainable diets, and food and nutrition security. These foods can improve diet quality, food and nutrition security, provide income households and contribute to SDGs 1 – 3 and 12. Despite this claim, the utilization of these foods has decreased. The aim of the study was to explore the knowledge, perception and utilization patterns of indigenous foods.

METHODS

A descriptive cross-sectional analytical study using mixed methods. A quantitative research survey was conducted involving 407 households. The following constructs were measured; household-survey, individual dietary diversity and household food insecurity. The qualitative survey explored the knowledge, perception and utilization patterns of indigenous foods through focus group discussions, talking circles and in-depth interviews.

RESULTS

Among a list of 48 indigenous foods, *cucurbita pepo* 96.1% (n=391), *plectranthus esculentus* 95.3% (n=388), *tulbaghia violacea harv* 95% (n=387), *vachellia karoo* 94.1% (n=383), *ficus carica and lactarius corrungis* 93.4% (n=380) were highly known and consumed. More than half of the households (56.6%) were food secure and a medium score of the dietary diversity and consumption patterns. There was a significantly positive relationship between availability and accessibility ($r=0.615$, $p<0.001$), perception and consumption ($r=0.498$, $p>0.001$) of indigenous foods.

The qualitative RESULTS revealed that participants' knowledge and expertise in the utilization of the IFs was extensive. All participants had positive perception towards indigenous foods. Conversely, the younger generation appeared to lack knowledge and skills of utilizing these foods. They perceived these foods to be hazardous and for the impoverished, whereas the elderly knowledge holders viewed them as wholesome and nourishing.
CONCLUSIONS

This study adds to the vast literature on indigenous foods in South Africa. Because of its focus on indigenous knowledge systems, it allows for a deeper understanding of the issues communities deal with which affect the utilisation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP34_16

SPATIO-TEMPORAL ANALYSIS WITH ARTIFICIAL INTELLIGENCE OF CLIMATE CHANGE IMPACTS ON THE DOUBLE AND TRIPLE BURDEN OF MALNUTRITION IN THE MEKONG DELTA OF VIETNAM

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BACKGROUND AND OBJECTIVES

Climate change projections made by the World Bank identify the Mekong Delta region in Vietnam as the area at greatest risk of flooding and heat-related mortality. These risks also threaten food availability and nutrition, as the Mekong Delta contributes to one-third of Vietnam's agricultural GDP, 50% of the country's rice production, 70% of fruit production, 65% of aquaculture production, 90% of exported rice, and 60% of exported fish.

METHODS

Spatio-temporal satellite images were analyzed using AI algorithms to map flood extents, land use changes, and heat stress over time. Digital ethnology, augmented by generative AI, was conducted to gather narratives on on the field, focusing on dietary habits, food access, and coping strategies such as migration caused by disasters.

RESULTS

Climate change has altered agricultural practices and dietary patterns through climate-related disasters. Flooding and extreme heat have reduced crop yields and impacted fish availability, resulting in decreased food diversity and an increased reliance on imported, calorie-dense foods. These shifts are further influenced by patterns of urbanization observed through VIIRS satellite imagery of night lights remote sensing. Generative AI-assisted ethnographies reveal widening inequalities in food access, disproportionately affecting women and children in marginalized communities, thereby exacerbating the double and triple burdens of malnutrition, particularly in the case of migration caused by climate disasters.

CONCLUSIONS

The Mekong Delta's agricultural productivity and nutritional health face increasing threats from climate-change-induced challenges, including flooding, extreme heat, urbanization, and disaster-driven migration. These factors have contributed to reduced crop yields, decreased fish availability, and a shift towards calorie-dense imported foods, worsening malnutrition, particularly among vulnerable populations such as women and children. Promoting diversified agricultural practices—such as integrating aquaculture with rice farming—can enhance income stability and food security. Additionally, investing in infrastructure to mitigate the impacts of flooding and salinity intrusion, such as improved irrigation systems and flood-resistant roads, is vital for sustaining agricultural productivity. Our findings highlight the importance of inclusive policies that engage marginalized communities and prioritize community programs of sustainable land and water management.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 37 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

SOAP37_01

ADVANCING CELLULAR AGRICULTURE: A CODE OF PRACTICE FOR CONTROLLED TASTINGS OF CULTIVATED MEAT

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BACKGROUND AND OBJECTIVES

The emergence of cultivated foods, eg meat and seafood derived from animal cell cultures, represent significant innovations. Recently, 2 novel food applications have been filed to EFSA and will undergo rigorous safety evaluations before EU market approval. Yet, while the underpinning technology progresses, the route to consume, taste, and review cultivated food products has remained closed, pending regulations. In '22, the NL Parliament, has passed a motion that enables tastings under strict conditions. We developed and tested a Code of Practice (CoP) designed for this process. This CoP provides a framework for safely conducting pilot-scale tastings of cultivated foods under controlled conditions prior to EU regulatory approval. It intends to facilitate and speed up innovation while ensuring participant safety and adherence to EU regulations. This CoP will help these developments.

METHODS

The CoP provides a process for obtaining an evaluation of a dossier for tastings from an independent expert committee. Risk assessment follows a lean adaptation of EFSA guidance, focusing on single or limited tastings rather than habitual consumption. Producers are required to provide comprehensive data on the cell-cultured product, including its composition, production process, potential allergens, microbiological status, and safety information for all constituents. Participation is limited to healthy adult volunteers who provide informed consent, have no allergy history with strict adherence to EU GDPR rules. Tastings are restricted to controlled environments with predefined participant limits.

RESULTS

An independent committee of toxicology, microbiology, medical, and ethical experts, evaluates safety based on submitted data, and issues only an unanimous no-objection. Each approved application allows for up to 10 tasting sessions within 1 year, with a maximum of 30 participants/session. All adverse events during or after tastings must be documented and reviewed. The CoP has been applied for 2 applications with no safety issues and full content by applicants and compagnies, supporting the approach towards increased innovation.

CONCLUSIONS

The CoP and evaluation by an independent expert committee, rooted in parliamentary support for advancing cellular agriculture in the NL, provides a robust framework for balancing innovation in cultivated food development with public health protection. This facilitates sensory evaluations critical to product development while adhering to EU regulatory requirements. The pilot phase, will be evaluated after 1 year. All this contributes to faster market introduction, increased food security and supports the EU protein strategy.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP37_02

NUTRITIONAL VULNERABILITY TO CLIMATE CHANGE OF INDIGENOUS PERUVIAN AMAZON WOMEN THROUGH THE STUDY OF FEEDING PRACTICES DURING PREGNANCY

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BACKGROUND AND OBJECTIVES

Indigenous women from the Amazon have high prevalence rates of anemia. Reports indicate that 70% of women of childbearing age and 60% of pregnant Indigenous women suffer from this condition. Socio-environmental determinants related to these anemia rates have been identified; however, it is unknown how climate change could affect feeding practices and impact nutritional vulnerability during pregnancy. Hence, having a better understanding of feeding practices among Indigenous women during this period can contribute to the development of public policies that effectively respond to the nutritional needs of the Indigenous mother and child.

METHODS

A qualitative methodology with an ethnographic design, following a phenomenological approach, was applied. Semi-structured interviews (n=25) and two participatory workshops with twenty-five Indigenous Peruvian amazon women from the one district were conducted. The last pregnancy was used as a reference to investigate experiences regarding feeding practices in relation to climate variability. The theoretical framework of climate change vulnerability and global health was used for analysis, applying a priori and posteriori coding, which allowed relevant themes for the participants to emerge.

RESULTS

It was found that weather and climate variability influenced feeding practices during pregnancy. The forest, river, and farmland are relevant sources of nutrients, and food preferences shaped the diet. The pregnant woman's partner was a support in caregiving and tasks related to feeding practices during pregnancy. The failure of the marital alliance, the demands of social programs, and weak messages about feeding practices from health services exacerbated nutritional vulnerability.

CONCLUSIONS

Nutritional vulnerability among pregnant indigenous women iis aggravated by climate change due to exposure to key weather indicators and a shifting local climate, which hinder labour or increase workload. The traditional food system is affected when there is a failure in marital alliance, as lack of partner support6 reduces planting space and future food availability. Health worker counseling prioritizes the unborn child's health over the mother's, while social program obligations consume their time without compensation. Finally, their adaptive capacity relies on knowledge, skills, food preferences, and family and community networks, activated during climate emergencies or when facing fragile social systems.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP37_03

TAILORING TRIALS OF IMPROVED PRACTICES (TIPS) TO IMPROVE CHILD FEEDING AND USE OF INDIGENOUS PRESERVED FOODS IN DROUGHT-AFFECTED KENYA: CONSIDERATIONS FOR CLIMATE SHOCKS

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BACKGROUND AND OBJECTIVES

Drought-prone regions in northern Kenya, face challenges in achieving optimal child nutrition practices due to food insecurity exacerbated by climate-induced shocks. The assessment, part of the USAID BHA-funded Nawiri project led by Catholic Relief Services, aimed to implement evidence-based interventions in Kenya's ASAL counties of Isiolo and Marsabit by addressing gaps in complementary feeding and exploring traditional preserved animal-sourced foods. The objectives were to: i) examine the acceptability and feasibility of incorporating preserved animal-source foods into IYCF ii) understand the roles of fathers, and elder women in IYCF decision-making iii) identify actionable strategies for mothers implementing TIPS amidst persistent food insecurity.

METHODS

Data collection employed qualitative and participatory formative approaches, including in-depth interviews (IDIs) and Trials of Improved Practices (TIPs) with 60 mothers (17-52 year of age), IDIs with 12 elder women, focus group discussions (FGDs) with 26 fathers and IDIs with 8 stakeholders. TIPs sessions were conducted across two rounds—dry season (Round 1) and prolonged drought (Round 2). TIPs sessions in Round 1 included combined same-day TIPs #1 and #2 visits, using food frequency questionnaires, household observations, and counseling to address gaps in complementary feeding practices, followed by TIPs #3 visits 7–10 days later to assess mothers' experiences and refine recommendations. All transcript data was coded in Dedoose software to identify themes, sub-themes, and illustrative quotes.

RESULTS

Nearly all mothers introduced camel milk, often fed raw, as a first food, prior to one year of age. TIPs counseling demonstrated significant improvements in dietary diversity and feeding frequency during the dry season. Most mothers experienced success in implementing TIPs recommendations during Round 1 versus Round 2 and stopped chewing food for the child, gave preserved meat, and fed eggs. Traditional food preservation practices like drying and fermenting milk showed potential to enhance IYCF but were underutilized. Gendered divisions of labor and restrictive norms limited child access to nutrient-dense preserved foods as fathers and older women were often excluded from IYCF decision-making.

CONCLUSIONS

Integrating traditional food preservation METHODSinto IYCF programming, while addressing social and gender norms, is essential for enhancing dietary diversity and resilience in drought-prone areas. Community-led efforts that challenge harmful gender and cultural practices can foster inclusive participation of fathers and elder women to drive change.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP37_04

BIODIVERSITY RICHNESS IN FOOD COMPOSITION TABLES AS A LEVERAGE TO INCREASE FOOD BIODIVERSITY IN SCHOOL MENUS. A CASE STUDY IN A RURAL ITALIAN MUNICIPALITY

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BACKGROUND AND OBJECTIVES

Increasing the consumption and production of biodiverse foods is essential to more sustainable food systems. The NUTRICO Project is dedicated to optimizing school menus considering the nutritional value and environmental impact of recipes. Biodiversity indicators are yet to be considered in this optimization process. Food composition data at the sub-species level are an essential requisite to include biodiverse foods in school menus.

Biodistricts are privileged areas to improve the sustainability of food systems thanks to the strong link between local food production and consumption. Thus, the current exploratory study was conducted in Tolfa, a rural municipality of the “Maremma Etrusca e Monti della Tolfa” Biodistrict, in central Italy.

The objective of the study is to assess the biodiversity of plant-based foods in the school menu and its potential for increase.

METHODS

The biodiversity richness of the Italian Food Composition Database (FCDB) was assessed at species and sub-species level (cultivars, varieties, wild, neglected and underutilized foods) for plant-based foods, based on their scientific and common name. The school menu was revised towards more sustainability through a participatory process with local stakeholders. Indicators of biodiversity were assessed before and after the revision. The potential for a further increase of biodiversity was assessed considering the sub-species data present in the Italian FCDB.

RESULTS

The Italian FCDB was shown to have a relatively high biodiversity richness of information; it contains data on plant-based foods from 113 species. For 28 of these species, one or more foods are described at the sub-species level -for a total of 80 sub-species- such as Brassica oleracea (cabbage) for which 7 sub-species are available.

After revision of the school menu for sustainability and variety, the overall number of species increased from 18 to 21 in vegetables, from 2 to 4 in cereals and from 3 to 5 in legumes. Foods described at sub-species levels were all in the vegetables group and increased from 3 to 5. The FCDB's richness at the sub-species level would allow for an increase in the number of sub-species included in the school menu, from 5 to 31.

CONCLUSIONS

Efforts to increase the availability of food composition data on biodiverse foods is worthy for consideration; it may facilitate the inclusion of more food biodiversity in optimized school menus.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP37_05

Climate change, food security, and dietary diversity in the West African Sahel: A mixed METHODSstudy in Senegal

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BACKGROUND AND OBJECTIVES

Climate change is currently impacting agricultural and food systems across the globe, with countries located in the West African Sahel being among the most impacted. The Sahel has historically relied on rainfed agriculture and pastoral livestock production as main sources of livelihood, which are now under stress due to the impacts of climate change.

METHODS

This study used a mixed METHODSapproach, collecting quantitative data via surveys and qualitative data via interviews and Photovoice, a community-based participatory research methodology. The surveys used validated food security indicators such as the Household Food Insecurity Access Scale (HFIAS) and the Dietary Quality Questionnaire (DQQ) which are tools that allow to identify household food security and dietary diversity. Photovoice sessions focused on exploring elements of resilience and vulnerability to food security in households. Interviews explored food security, resilience and vulnerability to climate hazards, and the role of institutions in adaptation efforts to climate change. The research sites selected were Kaffrine and Linguère.

RESULTS

High levels of food insecurity were reported in all of the field sites. In Linguère, 48% of respondents had some degree of food insecurity, and 67% in Kaffrine. Preliminary data analysis from the DQQ shows that across all sites dietary diversity remains low. Furthermore, preliminary analysis of the qualitative data shows that households are currently facing significant barriers to healthy diets based on climate hazards, such as floods and droughts, which have upended livelihoods. Challenges to crop and livestock production due to climate change are compounded by economic factors (inflation) and geopolitical factors (regional conflicts and security).

CONCLUSIONS

Climate change is currently impacting food security and dietary diversity in the Sahel. There is a need to support agricultural and livestock systems to reduce the high levels of food insecurity reported in our findings. Focus should be given to nutrient-dense foods, such as animal-source foods, for which consumption is currently low.

CONFLICTS OF INTERESTS

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SOAP37_06

FAST FOOD AND CLIMATE ISSUES: EXPLORING THE CONNECTION BETWEEN YOUNG CONSUMERS' CHOICES AND ENVIRONMENTAL AWARENESS

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BACKGROUND AND OBJECTIVES

Despite heightened awareness and abundant information concerning climate issues and human influence, few recognize the food systems' impact on the environment, and sustainability fails to motivate the typical Norwegian consumer when making their food choices. However, environmental concerns differ between groups and young consumers demonstrate a greater ability to change and adapt to more sustainable food practices compared to older generations. This demographic could serve as catalysts for change and thus represents an optimal population for examination. In this qualitative study, we aimed to investigate the eating habits of young consumers and the extent to which these are influenced by sustainability considerations. These focus group interviews, along with other activities, will in turn help inform the development of targeted canteen interventions in Norwegian high schools.

METHODS

Data collection was carried out in the fall of 2024 using semi-structured focus group interviews. Participants were high school students aged 16 to 19 years. A total of 7 interviews including 39 participants were conducted.

RESULTS

In our study, Norwegian high school students say that they prefer fast food, such as Mc Donalds, Burger King and take-away pizza when socializing with peers. Healthier food options are more frequently consumed at home. Primarily motivated by price and convenience, sustainability is not a consideration in their food choices. The students also seem to believe that the sustainable food choice is the expensive one, whereas processed foods are described as cheaper, tasty and more accessible. They all appear aware and informed of the ongoing climate crisis, but they do not present perspectives that connects it to their food consumption, nor do they seem to think that we will experience a climate crisis in Norway in this generation.

CONCLUSIONS

The findings suggest that these Norwegian adolescents, aged 16–19, prioritize price, convenience and taste over sustainability when making food choices, especially in social settings. Despite being aware of climate change, they seem to perceive it as a distant issue with limited relevance to their own lives. This disconnect highlights the need for new approaches to motivate sustainable food practices. Targeted interventions, informed by the age group's way of thinking, could potentially bridge the gap between climate awareness and sustainable eating habits among young consumers.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP37_08

ADHERENCE AND ACCEPTABILITY OF THE MYPLANETDIET STUDY RECOMMENDATIONS

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BACKGROUND AND OBJECTIVES

Effective incorporation of the multiple dimensions of a defined sustainable diet into FBDGs has the potential to transform food systems to support human and planetary health (1). To better understand what a healthy and sustainable diet for the Irish context looks like, the MyPlanetDiet (MPD) study was developed (2,3). Since acceptability is an important dimension of a sustainable diet (4), the objective of this analysis was to measure the adherence to, and acceptability of the MPD study recommendations.

METHODS

The MPD study was a 12-week parallel RCT (2022-2023) assessing the efficacy of personalised dietary recommendations based on Ireland's Healthy Eating Guidelines (HEG) (5) (control) vs. personalised healthy and sustainable dietary recommendations (intervention) for nutritional adequacy, environmental impact and acceptability. Dietary intake was captured using 3 x 24-hr diet recalls via FoodBook24 (6) at baseline, midpoint and endpoint. Dietary adherence at baseline and endpoint was measured through the application of a graded points system to dietary intake data. Diet-related GHGEs (7) and the Healthy Eating Index (HEI) score (8) were calculated. Acceptability of the main food group recommendations was measured using a tolerability questionnaire at endpoint. Data were analysed using Independent samples t-tests, Pearson's and Spearman's correlation coefficients and Chi-Square tests. P values <0.05 were considered statistically significant.

RESULTS

Change in dietary adherence from baseline to endpoint was similar for the control (n=147) and intervention (n=150) groups (P=0.21). Greater adherence to the intervention diet was significantly correlated with reduced GHGEs (P=0.02) and increased HEI (P<0.001), whilst greater adherence to the control diet was significantly correlated with HEI only (P<0.001). Acceptability of the dairy recommendation (1.5-2 vs. 3 servings/day for intervention vs. control groups), was lower in the intervention group, with 39% of intervention participants vs. 52% of control participants finding it 'easy/very easy' (P<0.05). Acceptability of red meat, fruits & vegetables, wholegrains, fish and treat food recommendations was not significantly different between the two study groups.

CONCLUSIONS

Personalised healthy and sustainable dietary recommendations for the Irish context showed similar adherence to those based on Ireland's current HEG, whilst also resulting in lower diet-related GHGEs. However, adjustments to the dairy recommendations are required to increase the acceptability of these healthy and sustainable dietary guidelines.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP37_10

MODELING CHANGES IN CONSUMPTION PATTERNS AND NUTRIENT AVAILABILITY FOR WOMEN OF REPRODUCTIVE AGE USING ALTERNATIVE CLIMATE SCENARIOS THROUGH 2050

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BACKGROUND AND OBJECTIVES

Climate change is a major threat to food security and nutrition. Changes in weather patterns, extreme weather, and land use changes negatively impact agricultural productivity while elevated atmospheric CO2 concentrations reduce nutrient content. We model changes in consumption patterns and resulting nutrient availability for women of reproductive age in sub-Saharan Africa and South Asia using alternative climate scenarios through 2050.

METHODS

Using the International Food Policy Research Institute's (IFPRI's) International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) economic model of the global food and agriculture system, we project changes in per capita consumption of over 40 major food categories under alternative climate scenarios through 2050. These projections are combined with data from the Global Expanded Nutrient Supply (GENuS) and Global Dietary Database (GDD) to estimate the nutrient content of food categories and baseline per capita consumption of each food category by young women of reproductive age (15-24) and relative to the overall population in each country or region. Changes in per capita availability of foods and the resulting available macro- and micronutrients are estimated for women aged 15-24 by country in 2050 for each climate change scenario relative to a no climate change baseline. We chose Burkina Faso, Chad, Madagascar, Malawi, Rwanda, Uganda to represent sub-Saharan Africa, and Bangladesh, Pakistan, and India to represent South Asia, based on dietary data availability in the model.

RESULTS

Incorporating climate change impacts tends to reduce projected food availability for women of reproductive age in key food groups, particularly grains, such as maize and rice, which are sometimes fortified with micronutrients. Compared to a no climate change scenario, in sub-Saharan Africa countries considered, consumption of maize is projected to decrease by 7-9% in 2050 in a high-emissions climate change scenario, while in South Asia climate change is projected to decrease consumption of rice by 3% in 2050. Maize and rice are a source of iron, zinc, and other key nutrients in these geographies as they make up a large portion of the diet and can be fortified. The negative effect of climate change on animal-source products, fruits and vegetables is more variable, though important for nutrient availability.

CONCLUSIONS

Projections of the effect of climate change on food consumption and nutrient availability for women 15-24 allow us to explore the potential for nutrition and food security interventions to mitigate negative impacts on maternal and child health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP37_11

PLANT-BASED DIETS AMONG YOUNG WOMEN IN SCOTLAND: ‘UNLESS IT'S AFFORDABLE, CONVENIENT, HEALTHY, AND FAMILIAR, IT’S A NO’

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BACKGROUND AND OBJECTIVES

Reducing meat and dairy consumption and moving towards more plant-based diets is a recognised climate change mitigation strategy with health co-benefits. However, for dietary shifts to be successful, they must be realistic and convenient. Among young people in the UK, barriers to adopting plant-based diets include the perceived inconvenience, particularly regarding meal preparation, and lack of knowledge about plant-based products. This study aimed to explore the factors influencing food choices, and how individuals define and use plant-based and convenience food in their everyday lives.

METHODS

We conducted semi-structured Zoom interviews with 30 women (aged 18-24) in Scotland between August and November 2024. 53% of participants were meat-eaters, 33% were meat-reducers and 13% did not eat meat. Participants discussed their food purchasing and consumption habits, factors affecting food choice, and their interpretation of, and experiences with, plant-based foods and convenience foods. Data were analysed using reflexive thematic analysis within a critical realist framework.

RESULTS

Families and social circles strongly shaped food choices, reinforcing meat consumption as the norm. Meat dishes were viewed as the safe and familiar default, while plant-based options were perceived as the inferior alternative. Participants often interpreted ‘plant-based’ exclusively as plant-based meat alternatives, which were seen as expensive, unhealthy, and overly processed. Concern about unknown ingredients were common, driven by both health and taste considerations. Cost was the primary driver of food choices, frequently outweighing all other factors. Health concerns played a role but were often used as a justification for meat consumption. Environmental concerns were low priority, with participants demonstrating limited or vague understanding of the environmental impact of food. Though convenience was valued and important, traditional convenience foods like ready meals were rejected in favour of batch cooking, quick prep meals, and pre-prepared components.

CONCLUSIONS

This study highlights the need to redefine and reposition both plant-based and convenience foods as healthy, affordable and familiar options among young women. Further, as health motivations are driving food choices in the opposite direction, the health benefits of increased plant-based wholefoods and reduced meat consumption should be emphasised in government and industry messaging.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP37_14

ADVANCING NUTRITION AND WOMEN'S EMPOWERMENT IN BURUNDI: A MID-TERM REVIEW OF A MARKET SYSTEMS DEVELOPMENT PROJECT

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BACKGROUND AND OBJECTIVES

In Burundi, over 60% of the population grapples with food insecurity, exacerbated by climatic changes. An agrifood market systems development project addresses these challenges in three target provinces, focusing on improving dietary practices, diversifying income, and boosting bio-fortified food production. The project also promotes gender equality, inclusion and empowerment, particularly among women in marginalised communities and people with disability. A mid-term review was conducted between March and April 2024 to assess project progress and refine priorities for implementation.

METHODS

A quasi-experimental mixed-METHODSapproach was employed for the review, with comparisons made to baseline data collected in 2022. Household survey data was collected from a stratified random sample of 1,015 participants, including 765 project beneficiaries, 150 people with disability, and 100 women from marginalised communities. Differences between baseline and endline were calculated and analysed, employing independent T-tests for continuous indicators and Chi-square tests for categorical indicators to identify significant changes in outcome variables.

RESULTS

The mid-term review revealed significant improvements in dietary diversity among women and children aged 6-23 months, increasing by 9.5% and 7.6% respectively. Households consuming nutrient-dense foods rose by 10%, and a third of the households reported increased income attributed to the sale of agricultural surplus facilitated by use of higher quality seeds and improved cultivation techniques. All surveyed beneficiaries (100%) reported growing a variety of nutrient-rich crops, including maize, vitamin A-fortified orange-flesh sweet potatoes, and high iron-fortified beans, compared to 84.0% at baseline. Notably, women-headed households (61%) demonstrated higher income growth compared to male-headed households (39%) and made more progress in adopting the promoted crops.

CONCLUSIONS

The project's interventions are leading to improved food and nutrition security for households through increased production, financial access and income diversification in the targeted households. However, disparities persist among women-headed households, marginalised communities, and people with disabilities, highlighting the need for more targeted support to achieve broader social inclusion and sustain these gains across all outcomes.

CONFLICTS OF INTERESTS

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SOAP37_15

POLICY RESPONSES, IMPLEMENTATION BARRIERS AND OPPORTUNITIES TO ADDRESS CLIMATE CHANGE VULNERABILITY TO THE UK FOOD SYSTEM: POLICY REVIEW AND STAKEHOLDER INTERVIEWS

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BACKGROUND AND OBJECTIVES

Climate change will increasingly impact global food systems. The UK has a highly complex food system with long supply chains, and is dependent on imports, some of which is from increasingly climate-vulnerable countries as well as experiencing its own environmental challenges. It is critical that current policy responses are understood to identify potential vulnerabilities and subsequent consequences for food and nutrition security. The aim of this study is to understand the UK food system policy responses and opportunities to further address climate change vulnerability through reviewing European food policy strategies in concurrence with interviews with key UK policy stakeholders.

METHODS

Firstly, a policy scoping review of national food strategies (NFS) and climate change risk assessments (CCRAs) in the UK and Europe was conducted to map and compare policies and actions being implemented in response to the risks from climate change on food systems. Food strategies were included if in the WHO EURO region and were translated into English. In addition, semi-structured interviews with UK policy-makers and stakeholders were conducted to identify barriers and levers for implementation of food system policy responses to climate change in UK. Participants were recruited through national UK networks. Interview questions structured by the following themes: policy responses, barriers and facilitators, collaboration, evidence needs, inequalities. Semi-structured online interviews were analysed using the Framework Method. Ethical approval granted from the LSHTM Ethics Committee.

RESULTS

In this review, 89 NFS and 42 CCRAs were analysed. More than half of national food strategies included policies to address or adapt to climate risks, with most policies focusing on food production and agricultural risks. Across NFS and CCRAs, the key health outcomes of which policies addressed focused on food security and reducing food-borne disease. 22 stakeholder interviews were conducted with representatives across the UK food system domains. Key limate food policy barriers included knowledge gaps, funding and capacity, complexity of the UK food system, lack of collaboration and opposing agendas e.g. net zero and sustainable diets being prioritised over food system adaptation and resilience.

CONCLUSIONS

The UK food system is vulnerable to future climate risks and there is some evidence of key policy implementation to respond. However, UK stakeholders indicate that many barriers persist creating challenges for future innovation to ensure the food system is resilient, equitable, safe and healthy.

CONFLICTS OF INTERESTS

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SOAP37_16

TRACKING DIETARY SHIFTS FOR LOWER CARBON FOOTPRINT IN ITALIAN HOUSEHOLDS

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BACKGROUND AND OBJECTIVES

Dietary shifts are established as major pathways to curb greenhouse gas emissions (GHGE). Whilst some recent studies assessed the environmental footprint of diets, few studies had explore the different strategies that consumers have implemented in their diet to reduce their carbon footprint. Our aim was to explore the dietary shifts of consumers that have lowered their carbon footprint over time.

METHODS

Food purchase data from approximately 6,000 Italian households were collected between 2019 and 2024. Food-related GHGE were assessed using life cycle assessment. Households who have successfully reduced their food-related GHGE over the period 2019-2024 were identified and called “champions". Total volume of food purchases and their associated GHGE and expenses were assessed at both time points. Patterns of dietary changes among “champions” were identified through a latent class analysis using food purchase changes. Sociodemographic characteristics were also described.

RESULTS

Among consumers, 315 "champions" were identified. This reduction was mainly achieved through decreased consumption of animal-based foods and increased intake of plant-based foods such as fruits and vegetables. We identified distinct patterns of dietary changes among the champions, which were associated with sociodemographic factors.

CONCLUSIONS

These findings emphasize the need for tailored strategies that consider demographic and behavioral differences to promote widespread adoption of sustainable dietary practices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 50 - CLIMATE CHANGE, SUSTAINABILITY AND NUTRITION

SOAP50_01

RESILIENCE EFFORTS FOR SUSTAINABLE HEALTH: DEFINING AND CONTEXTUALIZING COMMUNITY NUTRITION RESILIENCE

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BACKGROUND AND OBJECTIVES

Resilience efforts are still in the early stages, and there is a pressing need to accelerate our understanding of these initiatives. The nutrition capacities of local communities to withstand the effects of disasters depend on a clear understanding of the local context and how program implementers align their initiatives with existing systems. Currently, there is no clear definition of community nutrition resilience. Thus, the study aimed to describe the definition of community nutrition resilience and understand its capacities and contextualize it in the local health system.

METHODS

The study applied qualitative research design. It involved a comprehensive literature review of published materials from 2010 to 2024. The study identified 30 articles relevant to the study. Then, an in-depth interview was conducted with 16 purposively selected respondents in Quezon Province, Philippines which include nutrition program implementers at municipal and village level.

RESULTS

The community's nutritional resilience was situated within the broader framework of the health resilience system. In the context of disaster, community nutrition resilience was defined as the capacity of communities to absorb, adapt, and transform geared towards attaining optimum nutritional status and promoting the population's well-being to reduce vulnerability to shock and stress. The capacities of community nutrition resilience were also formulated. Absorptive capacity refers to the community's capability to deliver quality and adequate nutrition services using available resources focusing on preparedness and response during disasters, calamities, or emergencies. Adaptive capacity pertains to the community's ability to maintain nutrition and related services at a consistent level, even with reduced or alternative resources during recovery and rehabilitation. Transformative capacity involves transforming the nutrition functions and structure of the community to adapt to changing environments, particularly focusing on activities and strategies during prevention and mitigation.

CONCLUSIONS

There is a clear recognition that community nutrition resilience falls within the broader health system context. The study effectively clarifies the concept of community nutrition resilience and its underlying capacities in the face of disasters, providing valuable insights that can guide program implementers and policymakers in advancing more effective and sustainable resilience efforts.

CONFLICTS OF INTERESTS

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SOAP50_03

SUSTAINABLE DIET PATTERNS: A COMPARATIVE BETWEEN VEGAN, VEGETARIAN, PRO-VEGETARIAN AND OMNIVOROUS DIET

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BACKGROUND AND OBJECTIVES

In the last decades, interest on vegan, vegetarian and flexitarian diets has increased all around the World. In Europe followers of vegan and vegetarian diets comprise at least 10–15% of the population [1,2]. However, current knowledge about vegetarian diets remains limited, and their ability to meet nutritional requirements is often questioned. Therefore, it is mandatory to characterize the different non-meat patterns to better understand their nutritional and consumption profiles.

METHODS

Cross-sectional study based on data from the OMIVECA study (in Spain) using a 175-item food frequency questionnaire. Frequencies were transformed into grams/day (g/d) and adjusted for total caloric intake. Foods were grouped into 28 groups and intake was compared according to the type of diet using Analysis of Variance ANOVA (significance level: 5%). Several quality indices were built and compared between the groups: three pro-vegetarian diet indices [3], the Mediterranean Diet score [4] and the EAT-Lancet index [5]. Principal component analysis (PCA), K-Means and hierarchical clustering analyses were applied to characterize the dietary patterns. In PCA, dietary patterns were characterized based on factor loadings for each component (>±0.2).

RESULTS

A total of 596 participants were included (72.8% women, mean age: 25.8±8 years); 129 were vegan/vegetarian. Daily consumption of vegetables, mushrooms and potatoes was significantly higher in the non-omnivore groups (>450g/d) compared to omnivores ($p<0.001$). The three diet indexes were correlated between each other (rho = 0.5-0.6) and omnivores scored lower than the rest of the groups ($p<0.001$). In the PCA, a dietary pattern featuring the vegan diet was identified (explained variance: 15.2%), consisting of: dairy (-0.25), meat and meat products (-0.32), fish (-0.22), vegetables, mushrooms and potatoes (0.24), legumes (0.26), vegetable protein (0.35) and vegetable drinks (0.30). The second pattern, associated with a healthy vegetarian diet, accounted for 7.1% of the variance: eggs (0.26), fish (0.22), fruits (0.26), whole grains (0.29), pastries (-0.31), prepared foods (-0.33), sauces (-0.32). Two other patterns were associated with an unhealthy vegetable diet and omnivorous diet, with a total explained variance of 33%. The clustering METHODSunraveled four dietary patterns with different intake profiles.

CONCLUSIONS

RESULTS of the OMIVECA study reveal significant differences in eating habits between omnivores, vegetarians and vegans, beyond the exclusion of foods of animal origin.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP50_04

Associations between monthly hydroclimatic indicators and nutritional/ health outcomes in children under-5 years old in southern Madagascar: RESULTS of HydroNut project

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BACKGROUND AND OBJECTIVES

Climate crisis affects human health, including nutrition, yet evidence remains limited. We investigated how hydroclimatic factors are associated with health and nutrition outcomes as part of the HydroNut project.

METHODS

Time series data on monthly nutritional (severe acute malnutrition (SAM)) and health (acute respiratory infections (ARI), diarrhea and malaria) outcomes of children under five, along with hydroclimatic indicators (rainfall and leaf area index (LAI)), were collected for Amboasary (2014–2021) and Betioky (2016–2021) districts in Madagascar. Associations were assessed using negative binomial regression models adjusted for seasonality and trends providing the relative risk (RR) and its 95% confidence interval (95% CI). Lagged effects were also explored.

RESULTS

Data covered 54–90 months, depending on the indicator and district. In Amboasary and Betioky respectively, crude models showed positive associations of rainfall with SAM (RR [95%CI]=1.005 [1.002-1.007]; 1.003 [1.000-1.005]), diarrhea (1.002 [1.001-1.004]; 1.004 [1.001-1.006]), and ARI only in Betioky (1.002 [1.000-1.004]). Similar stronger associations were observed for LAI with SAM (3.138 [2.174-4.530]; 2.122 [1.504-2.994]), diarrhea (1.925 [1.512-2.450]; 2.220 [1.701-2.898]), and ARI in Betioky (1.813 [1.368-2.401]). Overall, lag effects appeared within three months for rainfall and two months for LAI, showing a protective role between months 4–10 according to district and outcome. Malaria showed negative associations, turning positive after 4–7 months for rainfall and 2–6 months for LAI.

CONCLUSIONS

Child health risks like SAM, ARI, and diarrhea increase within three months of rainfall or two months of LAI increases. These associations may be explained by post-rainfall microorganisms' proliferation, affecting children through multiple pathways. These diseases can be risk factors for SAM, which may set in before the effects of rain on harvests. Understanding these mechanisms is crucial to improving public health and humanitarian responses by implementing anticipatory actions to mitigate climate-related health risks.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP50_08

CONSUMPTION OF MILK, MEAT, EGG AND FISH IN THE NORWEGIAN DIET HAS CHANGED CONSIDERABLY IN 85 YEARS

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BACKGROUND AND OBJECTIVES

The consumption of animal-sourced foods (ASF), i.e. milk, meat, egg and fish, has historically been high in Norway compared to countries in other parts of the world. ASF provides essential nutrients and energy in the Norwegian diet. However, the diet has changed significantly in the last 85 years. In the public debate and in a research context, livestock-derived foods receive considerable attention. The impression is that consumption is high and increasing. This study aims to provide an overview of the consumption of ASF in the Norwegian diet over the last 85 years.

METHODS

Data was retrieved from food supply from 1939 to 2023. Edible portions of ASF have been calculated using various methods. Food waste has been accounted for.

RESULTS

The total consumption of ASF has changed considerably between 1939 to 2023. For milk, the reduction is down by approximately 230 liters/capita/year (45 %) as drinking milk is reduced, especially since the 1970s. The consumption of meat is doubled, to 55,1 kg/capita/year, mainly due to the increased consumption of pork and poultry. Fish consumption is down by 55 %, to 11,7 kg/capita/year, while egg consumption has increased by 84 %, to 11,4 kg/capita/year.

The changes in meat and milk consumption cause considerable changes in energy and protein supply from ASF. The energy supply from ASF is reduced by 29 % and protein supply by 15 % from 1939 to 2023. This is mainly due to reduced consumption of milk. The increase in meat consumption has not compensated for the decrease in reduced energy supply from milk. However, the increase in meat consumption has to a larger extent substituted the reduced protein supply from milk.

CONCLUSIONS

ASF has been an important part of the Norwegian diet for the last 85 years. However, there has been a major shift between milk and meat consumption during this period. As a result, energy and protein supply from ASF have changed considerably. To understand dietary patterns, it is crucial to evaluate changes in comparable food groups over time.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP50_09

EVALUATION OF PLATE WASTE IN A MAJOR HOSPITAL IN A LOW-AND MIDDLE INCOME COUNTRY

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BACKGROUND AND OBJECTIVES

Food waste is a pressing global issue, contributing to environmental, economic, and social challenges. About one-third of food produced for human consumption (approximately 1.3 million tons) is wasted annually, accounting for 8% of global greenhouse gas emissions, primarily methane, a potent contributor to global warming. Hospital food waste in particular has implications for both the environment and the nutritional status of hospitalized patients. There is a dearth of evidence on hospital food waste in low- and middle-income countries (LMICs). This study thus sought to quantify food waste from in-patient meals, identify factors contributing to waste, and describe disposal practices in a hospital in a LMIC.

METHODS

A mixed-method, cross-sectional study design was employed to recruit 108 in patients. Lunch meals were weighed before and after consumption to quantify waste, excluding non-edible portions. Semi-structured questionnaires identified reasons for waste, and interviews with waste management staff provided insights into disposal practices. SPSS version 26 was used for data analysis which included descriptive statistics, chi-square tests, regression analysis, and thematic analysis. Ethical approval for the study was sought and obtained from the Ethics and Protocol Review Committee of the School of Biomedical and Allied Health Sciences with protocol identification number SBAHS/AA/DIET/11004748/2023-2024. Informed consent was obtained from each participant.

RESULTS

Average plate waste prevalence of 23.58% was observed. Chi-square analysis showed that factors such as gender ($p=0.044$), satisfaction with variety of food served ($p=0.018$), and quantity of meal consumed ($p<0.001$) significantly influenced food waste. Predictors of food wastage included sex, portion size, and meal satisfaction. Landfilling was the primary disposal method, with key informants citing challenges like poor segregation, inadequate composting facilities, and staff shortages.

CONCLUSIONS

Hospital food services have some of the highest rates of plate waste compared to other foods service settings. This significantly impacts environmental sustainability and nutritional status of patients. This study highlights the need for targeted interventions, such as improved food utilization in hospital settings and improved food waste management practices, to reduce food waste and align with UN Sustainable Development Goals for food waste reduction.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP50_10

ADHERENCE TO THE PROVEGETARIAN FOOD PATTERNS AND ALL-CAUSE MORTALITY IN A MEDITERRANEAN MIDDLE-AGED POPULATION

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BACKGROUND AND OBJECTIVES

A provegetarian food pattern (PVG) that prioritizes the consumption of plant-based foods without completely excluding animal-based foods has been associated with health benefits. However, not all plant-based foods are healthy. We prospectively evaluated the association between provegetarian food patterns and total mortality in the X cohort.

METHODS

The X Project is a Mediterranean cohort study involving X university graduates. A PVG food pattern was calculated using a previously published score, assigning positive scores to plant-based foods and inverse scores to animal-based foods. Participants were categorized into quintiles based on their adherence to this pattern. Additionally, healthy (hPVG) and unhealthy (uPVG) provegetarian food patterns were derived. Cox regression models, adjusted for potential confounders were used and E-values were calculated to assess residual confounding.

RESULTS

Data from 17,989 participants were analyzed, with a mean baseline age (standard deviation) of 38 years (±12). During a median follow-up of 12 years, 460 deaths were identified. Participants with higher adherence to the overall and healthy provegetarian food patterns showed a lower risk of total mortality compared to those with lower adherence, after adjusting for multiple confounding factors: [PVG: HR Q5 vs. Q1:0.68 (95% CI: 0.50-0.93); p for trend= 0.020]; [hPVG: HR Q5 vs. Q1: 0.65 (95% CI: 0.47-0.90); p for trend= 0.016]. However, no association was found between the uPVG food pattern and mortality [uPVG: HR Q5 vs. Q1: 1.31 (95% IC: 0.93-1.83); p for trend: 0.037]. No major degree of overlap was found between the Mediterranean food pattern and the PVG food pattern or hPVG food pattern. The Pearson's correlation coefficient between these food patterns were 0.38 and 0.54 respectively. For the multivariate adjusted RESULTS in our study, the E-values for the PVG and hPVG estimates were 2.30 and 2.45, and for the confidence intervals: 1.35 and 1.46, respectively.
CONCLUSIONS

Better adherence to a provegetarian pattern, which prioritizes the consumption of healthy plant-based foods, reduces the risk of all-cause mortality in the X cohort. An unhealthy provegetarian food pattern was not associated with all-cause mortality in a Mediterranean middle-aged population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP50_11

SYSTEMATIC REVIEW OF PUBLIC FOOD PROCUREMENT POLICIES IN EUROPE TO ADDRESS CLIMATE, FOOD AND HEALTH OUTCOMES

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BACKGROUND AND OBJECTIVES

Changing food consumption in high-income countries toward diets that reduce climate change and environmental degradation while achieving healthy outcomes co-benefits has never been more urgent. One policy tool increasingly used by governments in European countries to affect heath, environment and social outcomes and drive systemic change is public food procurement (PFP). However, little is known about the impacts of implemented public procurement policies. The aim of this systematic review is to evaluate the evidence on the impact of PFP policies used by national and local governments in European countries to drive positive climate, environmental and health changes.

METHODS

Ten scientific databases and government food policies for all included countries were screened as data sources. Articles were included if they analysed policies at a national, regional or city-level affecting European populations and involved Implemented or evaluated PFP policy or interventions involving environmental sustainability in the design, aim or outcome.

RESULTS

We identified 3,634 records in the published literature. After double screening, 89 articles were retained for full text screening. Most studies outlined implemented sustainable policies strategies as well as scope and barriers to implementation. Of these eight studies evaluated various outcomes of implemented sustainable PFP policies. Key themes of environmental sustainability were organic food procurement, local or regional procurement and shorter supply chains, reduced greenhouse gas (GHG) emissions, animal protein reduction and increased plant foods. Policies were either implemented at national or municipality level, with large cities being key drivers of change. Schools were the most mentioned sector among policies only affecting one sector. Policies evaluations showed significant reductions in (GHG) emissions and meat intake following implementation of sustainable PFP policies in European municipalities. Improved school meal policies particularly when coupled with experiential educational activities and a whole school food environment Increased fruit and vegetables and promoted sustainable food knowledge.

CONCLUSIONS

Sustainable PFPs are a key policy tool to drive positive environmental and health changes with the potential to affect a large number of individuals and drive and orient a large amount of food productions. Policies affecting schools have the added benefit of helping develop sustainable eating habits.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP50_12

RESPONSE OF SMALLHOLDER FISHERFOLKS ON THE GHANA VOLTA TO CLIMATE VULNERABILITIES AND THE EFFECT ON LIVELIHOODS AND FOOD SECURITY

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BACKGROUND AND OBJECTIVES

Climate change disproportionately affects the vulnerable, posing serious threats to development. Aim: to determine the climatic vulnerabilities experienced by fisherfolks on the Ghana Volta Lake and the effect on their livelihoods, food security and nutritional status.

METHODS

This cross-sectional survey comprised 521 randomly-selected household heads predominately involved in fishing-related activities on the mainland and island communities of the Ghana Volta Lake basin. Using validated instruments, we measured indices for climate vulnerability and coping strategies as key exposures. Data was thematized per vulnerability intensity and differences determined descriptively. Predictors for poverty as outcome was tested using ordinal regression and the adjusted odds ratio (OR) reported at 95% confidence intervals (CI).

RESULTS

Overall, 13.2% experienced critical climate vulnerabilities with a significant difference between the male and female-led households (15.0% vs 8.4%). Stressed (51.1%), crisis (27.8%), and emergency coping METHODS(19.2%) were adopted in response. On the poverty continuum, 53.9% were extremely poor while 3.1% were least poor. Diets of 15.7% and 27.3% was poor and borderline. Food insecurity was 21.5% (4.0% mild, 7.9 moderate, 9.6 severe). Anemia was 52.7%. Key adaptation measures were fishing in deeper/dangerous areas of the lake (36.1%), migration (31.7%), catching immature fish (25.9%), and investing in postharvest storage (24.9%). Independent fishing-related risk factors associated with critical climate vulnerabilities were using motorized canoe (OR:4.13, 95% CI:1.77-9.66), years of fishing experience (OR:0.94, 95% CI:0.91-0.98) and knowledge on climate mitigation measures (OR:16.59, 95% CI:7.68-35.86). Poverty was associated with critical climate vulnerability (OR:3.63, 95% CI:1.16-11.30), part-time fishing (OR:4.77, 95% CI:1.03-22.03), using a larger canoe (OR:3.31, 95% CI:1.63-6.74), towed dredged net fishing method (OR: 2.75, 95% CI:1.01-7.49), selling the fish catch in a processed form and adopting emergency (unhealthy) coping mechanisms (OR:2.81, 95% CI:1.05-7.47). Climate vulnerabilities did not significantly affect food security but it effected household diet quality and anemia levels, with females having a higher odds.

CONCLUSIONS

Over half live in extreme poverty and face food insecurity while many rely on risky coping mechanisms, emphasizing the urgent need for targeted adaptation strategies that integrate climate resilience into poverty alleviation efforts.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP50_13

KEEPING BREAD FLOUR NUTRITIOUS: A FOOD SYSTEMS PERSPECTIVE ON THE UK WHEAT AGRI-FOOD SYSTEM

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BACKGROUND AND OBJECTIVES

Wheat is a major global staple crop, providing essential nutrients and energy. Enhancing wheat's nutritional quality across value chains (VCs) can be a sustainable approach to achieving food security and nutrition, amidst evidence of nutrient decline in wheat and the impacts of climate change. This study aims to assess the nutritional quality of bread flour within the UK wheat VCs by examining nutrient variability in commercially retailed bread flour, the associated factors to variability and the cost per unit of nutrient, and exploring producers' and millers' perceptions of nutrition standards for wheat, flour and bread.

METHODS

A mixed-METHODSapproach was employed, including a survey of 143 milling organizations across the UK. Eight millers, selected based on sustainability goals and operational scale, formed as case studies with in-depth interviews using the Value Chain Analysis for Development (VCA4D) framework. Survey data were analysed descriptively, and interview transcripts were thematically analysed. Bread flour samples (white, brown, wholemeal) from 143 mills were analysed for protein and trace minerals and the cost per unit of each nutrient was calculated. Multivariate analysis was conducted to explore the impact of variety, milling practices, farming practices, and sourcing regions on nutrient concentrations. Triangulated findings from the survey, qualitative interviews, and nutrient analyses were used to identify drivers of flour nutritional quality across the wheat agrifood system in the UK.

RESULTS

Of the 143 surveys distributed, 24% were completed. Local wheat imports were common, with regional preferences for specific varieties (e.g., YQ population wheat). About 56% of miller-respondents sourced their grains from organic farms. Small-to-medium millers prioritised old wheat varieties, grain provenance, traceability, and organic practices, linking these to flour's nutritional quality. Commercial millers viewed mandatory fortification of white flour as essential for meeting the population's nutrition needs, while small millers were limited to producing wholemeal flour. Nutrient variations in bread flour between millers were influenced by wheat variety, milling methods, and farming practices. Regional differences in the availability, cost, and key micronutrients of bread flour were also observed.

CONCLUSIONS

With evidence of declining nutrients in wheat, a systems approach is essential to identify entry points for maintaining or improving its nutritional quality. Key factors to explore within VCs include wheat variety selection, milling practices, fortification, and agronomic methods, ensuring the wheat agri-food system can sustainably deliver nutritious flour for all.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP50_16

PROMOTING ENVIRONMENTAL HEALTH AND COMMUNITY NUTRITION EQUITY THROUGH INDIGENOUS KNOWLEDGE IN AFRICA

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BACKGROUND AND OBJECTIVES

Indigenous knowledge plays a crucial role in promoting environmental health and community nutrition equity. This study aimed to explore how traditional agricultural practices, and dietary habits contribute to improving food security, biodiversity, and reducing malnutrition in Africa.

METHODS

The study employed qualitative methods, collecting data through semi-structured interviews with 60 community leaders, farmers, and nutrition experts across five regions in Ghana. Data analysis focused on identifying themes related to traditional agricultural practices, indigenous diets, and policy recommendations.

RESULTS

The findings revealed that traditional practices, such as intercropping and organic soil management, significantly enhanced food security and biodiversity preservation. Indigenous diets were identified as nutrient-dense and culturally appropriate, leading to noticeable reductions in malnutrition rates among communities. Participants stressed the importance of aligning indigenous knowledge with modern development strategies to address pressing challenges effectively.

CONCLUSIONS

The study concluded that indigenous knowledge is a valuable resource for addressing environmental and nutritional challenges in Africa. Policymakers are urged to integrate these practices into sustainable development policies while ensuring strong connections between policies and their practical implementation to foster equity and sustainability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 20 - FOOD SCIENCE, GASTRONOMY AND LIFE QUALITY

SOAP20_1

POTENTIAL HEALTH BENEFITS OF A DIET RICH IN ORGANIC FRUIT AND VEGETABLES VERSUS A DIET BASED ON CONVENTIONAL PRODUCE: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES
Over the past decade, there has been growing interest in the production and consumption of organically grown food. Scientific studies have shown that organic fruits and vegetables (FV) are of higher quality in terms of nutrient and pesticide levels, although it is difficult to conclude that these products are potentially better for health than conventional FV. To date, three systematic reviews have been conducted in 2010, 2012, and 2019 to evaluate the effect of consuming organic FV on health, but none have demonstrated a real benefit due to heterogeneity of RESULTS and biases in studies. As the literature has expanded since then, this review was conducted to determine whether current evidence shows that a diet rich in organic FV is healthier than one based on conventional products.
METHODS

A systematic search was conducted using the PubMed and Web of Science databases to identify articles published between January 2003 and December 2022. Articles were analyzed uniformly by two reviewers, using a specific summary sheet template, and scored from 1 to 5. The level of evidence and the quality of studies conducted in humans were assessed using the JADAD score and the Haute Autorité de Santé (HAS) method. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach was followed.

RESULTS
A total of 12 human studies were included. The studies often presented contradictory or contradictory effetcs RESULTS and methodological limitations. Only six of the twelve studies found significant associations between organic food consumption and the health effects.
CONCLUSIONS

Current data do not allow for a firm conclusion to be drawn on a greater health benefit of a diet rich in FV based on organic products compared with a diet based solely on conventional products. Currently available data are insufficient and study designs (participants, exposures, durations, health outcomes, and residual confounding factors) are highly heterogeneous. Well-designed interventional studies are needed.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP20_4

NUTRITIONAL AND HEALTH PROMOTING CONTRIBUTIONS OF INDIGENOUS SPICES, HERBS, CONDIMENTS AND OTHER SEASONING AGENTS IN TROPICAL AFRICA

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BACKGROUND AND OBJECTIVES

In the Sub-Saharan Africa, there exists aboriginal spices, herbs, condiments produced by processing seeds or exudate and other seasoning agents likes local salts, processed insects and fishes as well as wild edible mushrooms. The sahelian part mostly rely on local herbs, processed plant seeds and traditional salts to season meals.The goal is to unveil the diversity of local seasoning agents of tropical Africa, their properties on diseases and opportunities.

METHODS

Field and literature surveys were conducted in local spices consumption areas. Samples collected and mixtures produced were characterized (lipids, protein, carbohydrate, phenolic and volatile compounds, minerals elements, aromatic and volatile compounds, health properties) through physicochemical methods.

RESULTS

Over 30 different less-known spices were reported, herbs, condiments in the form of salts, fermented pulses/seeds, wild mushrooms, insects, fermented/dried fishes. The spices are in the form of dried fruits, bark, roots and sap of trees, bulbs, leaves of plants. They are sources of phenolic compounds (1.05g/100g to 38.8 g/100g), fats (1.95 g/100g to 53.36 g/100g) (ω-3 and ω-6), protein (4.2 g/100g to 13.97 g/100g), hundreds of aromatic/volatile compounds with flavoring properties. They are claimed and used for their health promoting properties and supported by scientific evidences (chronic diseases, enzymes and hormone stimulation antimicrobials). The herbs are aromatic (*Occimum graticimum* African basilic, African thyme…), some acidic (*Hybiscus sabdarifa*, *Adansonia digita…*) used mosltly in Sahel for food seasoning. The fermented seeds/pulses (*Parkia biglobosa*) contain compounds like ammonium, amines, free amino acids, short chain fatty acids, pyrazynes alcohols. Local seasoning salts are sources of minerals (Na: 4%, K: 95%, Mg: 0.1%, Ca: 0.29 %, Zn: 0.0025%, Cr: 0.019%) and impar characteristic taste to meals. About 14 mushrooms impar taste due to octenol, esters, volatile FFA, ketones and are source of proteins 8.1 to 46 %, fat 1.5% to 20, minerals 7.4 to 14.1 % and mycosterol. Wild edible insects (>85) unlike fermented/smoked fishes are consumed for proteins, as seasoning in the various tropical Africa zones.

CONCLUSIONS

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The present work highlights the necessity of promoting the recognition, role played by indigenous spices, herbs, condiments and other seasoning agents on health, nutrition (sodium) and carbon footprint; enhance tastes (spicy/pungent, umami, acid, sour ….).

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP20_10

PROTEIN QUALITY OF SOUTH AFRICAN POTATOES

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BACKGROUND AND OBJECTIVES

To meet the growing need for alternative sources of high quality protein, research on various supplementary crops is encouraged to determine the true and total nutritional value of food protein. Alternative sources of protein can make a significant contribution to protein intake of vulnerable individuals especially in countries where high quality proteins from animal source foods is scarce.

METHODS

For this project the protein quality and quantity of four of the most commonly consumed potato cultivars in South Africa were evaluated. Protein content was determined using both the nitrogen to protein conversion factor as well as by summation of amino acids for four of the potato tubers. Chemical scores of essential amino acids, the essential amino acid index and the protein digestibility corrected amino acid score (PDCAAS) were calculated according to the FAO expert consultation on 'Dietary protein quality evaluation in human nutrition (2013)'. A faecal digestibility value of 90, derived from a calf, was used for potatoes. The digestible indispensable amino acids score (DIAAS) was also calculated according to the 2013 FAO Report using calf true ileal amino acid digestibility coefficients.

RESULTS

Protein content for the tubers varied between 1.65g/100g and 2.14g/100g when using protein conversion (Jones 6.25) and 1.64g/100g and 2.14g/100g when using the sum of amino acids with significant differences found between the amino acid content of the different tubers. All PDCAAS values were truncated to 1 which may mean that valuable information was lost due to truncation. DIAAS values for the different tubers ranged between 99 and 114. When using the essential amino acid index and DIAAS all four potato cultivars that were analysed can be classified as containing protein of good quality. Leucine was found to be the first limiting amino acid in potatoes, which is an amino acid that is commonly limited in plant based products.

CONCLUSIONS

Even though potatoes are not typically considered as a source of protein, due to the its low protein content, the unique amino acid composition allows potatoes to be regarded as a plant based food that contains high quality protein.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP20_11

EXPANDING THE THAI FOOD COMPOSITION DATABASE: VITAMIN D CONTENT IN COMMONLY CONSUMED FISH AND MUSHROOMS

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BACKGROUND AND OBJECTIVES

Vitamin D deficiency is prevalent in Thailand across all age groups. However, a comprehensive database of vitamin D content in Thai food is lacking. This study aimed to address this gap by quantifying various forms of vitamin D in commonly consumed fish and mushrooms.

METHODS

Ten fish and ten mushroom species were selected based on their popularity in Thai cuisine. Samples were homogenized, freeze-dried, and analyzed using liquid chromatography-tandem mass spectrometry (LC-MS/MS) to identify and quantify seven vitamin D forms (vitamin D2, D3, D4, ergosterol, 7-dehydrocholesterol, 25-OH D2, and 25-OH D3).

RESULTS

Vitamin D3 was the predominant form in fish. Common silver barb, red Nile tilapia, and Nile tilapia showed the highest levels (48.5, 31.0, and 19.8 µg/100g fresh weight, respectively), while other fish contained lower amounts (2.4-5.7 µg/100g). In contrast, mushrooms primarily contained vitamin D2. White Shimeji and Lung Oyster mushrooms had the highest content (7.96 and 6.21 µg/100g fresh weight, respectively), while other species displayed lower levels (0.06-2.30 µg/100g). This novel vitamin D data has been incorporated into the publicly accessible Thai Food Composition Database.

CONCLUSIONS

This study provides the first comprehensive data on vitamin D content in commonly consumed fish and mushrooms in Thailand. This information enriches the Thai Food Composition Database, enabling dietary assessments and potentially informing strategies to combat vitamin D deficiency in the population.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP20_13

POSITIVELY CULINARY AS A MODEL FOR ORGANIZATIONAL TRANSFORMATION TOWARDS A FOOD-FIRST, HUMAN-CENTRIC MINDSET THAT ENHANCES CULTURE AND DRIVES SUSTAINABLE BUSINESS GROWTH

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BACKGROUND AND OBJECTIVES

Positively Culinary (PC) at a multinational Food and Drink company is a transformative program to enhance food science, gastronomy and life quality for Global R&D (3000 associates) by proliferating a “food-first” mindset that imparts food system thinking, DE&I and sustainable business growth. PC’s strategic approach includes creating meaningful food experiences that deeply resonate with consumers and drive change towards a food-centric, inclusive culture with diverse human needs at the core. PC can serve as a model for impactful transformation at organizations worldwide.

METHODS

PC utilized a 3-pronged structured change management framework to drive adoption then sustain mindset and behavioral changes over time: 1) skill-focused training, 2) events & engagement, 3) external perspectives. As an example, product developers (PD) enrolled in hands-on cooking instruction by professional chefs to help connect food science and industrial METHODSto at-home cooking techniques. PC events immersed PD in topics such as evidence-based nutrition guidance for incorporating whole grains into food and consumer diets. PC Advisory Board (multidisciplinary external experts from behavioral and nutrition science to anthropology) guided PC curricula and delivered diverse perspectives.

RESULTS

In 2023-24, employees completed 2000 trainings. Over 150 leaders and associates engaged with 7 external experts, resulting in 18 key insights that influenced organizational changes and 11 initiatives with business application. DE&I events surpassed projected attendance; 90% agreed objectives were met. Proprietary Food Culture workshops with 92 PDs influenced mindset and technical output: products developed after PC scored high in consumer evaluations (ex. overall liking 7.7/9 and 89-93% agreed product met expectations).

CONCLUSIONS

The comprehensive, multifaceted PC program revolutionized the work of R&D by instilling a food-first mindset among technical teams. PC trainings enhanced PD innovation processes to include both food science and the context of food in people's lives, with proven impact on the end consumer. PC will serve as a model beyond R&D at its parent Food & Drink company and can for other organizations that seek culture and mindset transformation, and sustainable business growth. This work was funded by PepsiCo, Inc. The views expressed in this abstract are those of the authors and do not necessarily reflect the position or policy of PepsiCo, Inc.

CONFLICTS OF INTERESTS

Rocha has worked at PepsiCo for 15 yearsWilk has worked at PepsiCo for 3 years. Prior, she worked at The Wonderful Company.

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SOAP20_15

FROM KNOWLEDGE TO ACTION: UNDERSTANDING STUDENTS' WASTE DISPOSAL PRACTICES

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BACKGROUND AND OBJECTIVES

Plastic waste is a global environmental issue, with approximately 1 to 2 million tons entering the oceans each year, causing considerable harm to marine life and ecosystems. The country has implemented several key regulations aimed at achieving zero waste and improving waste management. A government regulation in 2012 mandated waste reduction, recycling, and reuse. A presidential regulation in 2017 targets a 30% reduction in waste and processing of at least 70% of the remaining waste by 2025. Schools play a role in educating students on environmentally friendly practices. However, only 10% of the schools in the country received this award. The study aims to provide insights into practices regarding the disposal of packaged wraps by adolescents, and to identify gaps between their environmental knowledge and actual behaviors.

METHODS

Eight focus group discussions were held with 39 students from four junior and senior high schools in November 2024. The schools were purposively selected. Data were gathered and analyzed thematically.

RESULTS

Students primarily dispose of packaged wraps in trash bins available in all schools, though not all schools differentiate between organic and non-organic waste. When recycle bins are full, students often use other bins that are still empty. Some schools have special place to throw plastic bottles. Outside school, finding trash cans can be challenging, leading some students to hold onto wrappers until they find a bin or throw them away at home. However, if the wrap is wet or dirty, some students discard it on the road.

CONCLUSIONS

The study identifies a significant gap between students' knowledge and their actual waste disposal practices. To improve waste management, schools should implement clearly labeled bins for organic, non-organic, and recyclable waste, and ensure they are emptied regularly. Increasing the availability of trash bins along common routes can help reduce littering. Additionally, scaling up the use of organic wrapping and conducting regular educational sessions can foster a deeper understanding and commitment to proper waste disposal among students.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 26 - FOOD SCIENCE, GASTRONOMY AND LIFE QUALITY

SOAP26_01

Is there an association between depression and omega-3 fatty acid status? - RESULTS of a cross-sectional study in children and adolescents

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BACKGROUND AND OBJECTIVES

Omega-3 fatty acids (Ω3-FA) supplementation is discussed as a therapeutic approach for depression. While meta-analyses of randomised controlled trials in adults showed heterogeneous RESULTS, only few studies are available in children and adolescence. The aim of this study was to analyse the relationship between Ω3-FA status and depression in children and adolescents.

METHODS

The analyses were based on data from 327 patients (11-19 years; 66% ♀) admitted to a child and adolescent psychiatry (2016-2020). Eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), as well as the Ω6-FA arachidonic acid (all in % of total fatty acids) were measured in whole blood. The Ω3 index was calculated as the sum of EPA and DHA. Depression severity was assessed using the Beck Depression Inventory II (BDI-II), the Diagnostic System for Mental Disorders using self-assessment (DISYPS-S) and external assessment by parents (DISYPS-P). Linear regression models (BDI-II) and logistic regression models (DISYPS-S and DISYPS-P) were used to analyse the relationship between FA status and depression.

RESULTS

Only one participant had an Ω3 index (median 4.17%) within the recommended range of 8-11%. No association was found between Ω3-FA status and the BDI-II. However, an increase in Ω3 index [OR 1.55 (CI 1.04; 2.30), p=0.03] and DHA status [OR 1.64 (1.06; 2.53), p=0.03] was associated with an increased risk of parent-reported depression (DISYPS-P), but not self-reported depression (DISYPS-S). Similarly, arachidonic acid status was inverse associated only with DISYPS-P [OR 0.76 (CI 0.58; 0.99), p=0.04].

CONCLUSIONS

Our RESULTS indicate that the Ω3-FA status in children and adolescents with mental disorders is generally below the desirable range. It remains unclear whether improving the Ω3-FA status, for example through supplementation, could have a positive longitudinal impact on depression in this stage of life. The findings of this cross-sectional analysis could be an argument against this hypothesis, as we found that a higher Ω3-FA status was rather associated with a greater risk of depression.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP26_02

PERSONALIZED LIFESTYLE ADVICE FOR PEOPLE WITH TYPE 2 DIABETES – USING CONTINUOUS GLUCOSE MONITORING AND CONTEXTUAL DATA

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BACKGROUND AND OBJECTIVES

The effects of lifestyle interventions on metabolism in people with type 2 diabetes (T2D) are usually studied in controlled clinical trials and reported as group average values. However, mounting evidence indicates that the metabolic response to nutrient intake and physical activity is highly personal. Continuous glucose monitoring (CGM) offers an opportunity to gain insight in the direct and personal response of circulating glucose concentrations to lifestyle behaviors. We aimed to investigate the potential of using CGM to train algorithms for use for (real-time) personalized lifestyle recommendations to improve glucose (self)management.

METHODS

In a real-world study, 38 people with T2D used CGM and recorded contextual data for 11 periods of 4 days of which 3 control periods and 8 intervention periods (2x low carbohydrate diet, 2x Mediterranean diet, 2x walking after each meal and 2x ‘active day’ (hourly 5-minute exercise bouts). Oral glucose tolerance tests were performed to quantify insulin resistance and beta-cell functioning. Statistical modelling techniques were used to predict 2h glucose and to investigate interindividual differences in effects of lifestyle on CGM metrics.

RESULTS

On overage, low carbohydrate diet, walking after meal and active day, but not the Mediterranean diet resulted in a lower mean glucose (±SD; respectively, 7.6±1.8, 8.0±2.0, 8.0±2.0 and 8.5±2.3 mmol/L) as compared to control (8.1± 1.9 mmol/l). The magnitude and direction of effects on other CGM metrics varied between interventions as well. For instance, the low carbohydrate diet sorted most beneficial effects for people with both insulin resistance and poor beta-cell function, as compared to individuals with primarily a poor beta-cell function. RESULTS of a linear mixed effect model identified carbohydrate intake (g) in the past 5 minutes as well as in the past 30 minutes, sleep duration during the previous night (h) and physical activity (metabolic equivalents) over the past 12 hours and in the past and future 30 minutes as the most prominent determinants of glucose concentrations in the short run. The magnitude of effects of carbohydrate intake and physical activity on glucose levels differed substantially between individuals.

CONCLUSIONS

Lifestyle interventions affect glucose profiles within 4 days. Lifestyle effects seem to be related to the level of insulin resistance and beta-cell function, underlining the importance of personalized treatment. Pending further validation, predictive models developed in this study could be used for self-management tools for personalized lifestyle treatment of T2D.

CONFLICTS OF INTERESTS

All other others declare no conflict of interest. One of the authors has a paid position at Roche Diagnostics Nederland BV. that markets tools related to diabetes self-management.

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SOAP26_03

DYNAMIC GLYCEMIC ADAPTATIONS FOLLOWING LONG-TERM FASTING: PRELIMINARY INSIGHTS FROM THE FASTFORWARD STUDY

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BACKGROUND AND OBJECTIVES

Fasting has emerged as a promising intervention for metabolic health, with growing evidence that fasting-induced improvements in glycemic control can have therapeutic effects for individuals affected by type 2 diabetes. Although metabolic adaptations during the first days of fasting are well described, little is known about the transition back to normal eating. The FastForward study examines glycemic metrics and metabolic adaptations during long-term fasting and the 14 days following the breaking of the fast.

METHODS

From our ongoing prospective observational study, we analysed preliminary data from 100 participants (65% women, 35% men) who underwent Buchinger fasting for 5 to 28 days, followed by 1–4 days of food reintroduction in a controlled clinical setting. Venous blood samples were collected at three time points: pre-fasting, on the morning of breaking the fast, and 1–4 days post-fasting, measuring HbA1c, insulin and fasting glucose. Continuous glucose monitoring (CGM) was initiated on the morning of breaking the fast.

RESULTS

Participants had a mean age of 55 years (range: 21–75) and a mean BMI of 30 ± 12 kg/m². Twenty percent were prediabetic or had type 2 diabetes. Participants lost 3.75 ± 2.23 kg during fasting. Blood glucose (96.2 ± 23.9 mg/dL), insulin (12.2 ± 16.9 mIU/L) and HbA1c (6.0 ± 3.76%) decreased during fasting by 10.0 ± 2.8 mg/dL, 4.4 ± 1.9 mIU/L and 0.52 ± 0.34%, respectively. This decrease persisted after food reintroduction. The proportion of participants with time below range (range: 70–180 mg/dL) was higher on the day of fasting termination (5.7 ± 0.6%) and the first day post-fasting (4.6 ± 0.6%) compared to the subsequent food reintroduction days (<3.5%). This was accompanied by increased glucose variability, as reflected by the mean coefficient of variation, which rose from 15.5 ± 0.8% on the day of breaking the fast to 21.2% ± 0.9% on the first day of food reintroduction. This heightened variability persisted up to the fourth day of food reintroduction. These data show heightened metabolic sensitivity immediately after fasting, and a persistence of fasting-induced glucose-lowering effects for up to a week after the food is reintroduced.

CONCLUSIONS

Our findings show heightened glycemic variabilit in the initial days of food reintroduction after fasting, followed by stabilization and improved glycemic control. These RESULTS underscore the potential of therapeutic fasting to normalise glycemic regulation and suggests an importance of post-fasting nutritional guidance to optimize outcomes.

CONFLICTS OF INTERESTS

Authors MK, EKS, FWT and RM are employees of the Buchinger Wilhelmi Development and Holding GmbH

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SOAP26_04

SERUM METABOLOMES AND PROTEOMES LINKING CIRCULATING MONOUNSATURATED FATTY ACIDS TO ATHEROSCLEROSIS PROGRESSION AND CARDIOVASCULAR MORTALITY

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BACKGROUND AND OBJECTIVES
Few studies have explored the link between circulating monounsaturated fatty acids (MUFAs) and cardiovascular health, and the RESULTS are mixed. We aim to evaluate the relationship between circulating MUFAs and the progression of carotid intima-media thickness (CIMT), as well as cardiovascular mortality, and whether these associations are mediated by certain metabolomes or proteomes.
METHODS

Circulating MUFAs were measured in erythrocyte membranes within the Guangzhou Nutrition and Health Study (GNHS) (n=2872) and in serum within NHANES (n=6835). Metabolomes and proteomes were analyzed in subsamples of 2618 and 915 GNHS participants at middle-term of the follow-up period, respectively. CIMT progression at the common carotid artery (CCA) and carotid bifurcation (BIF) was monitored via ultrasound over 9.6 years in GNHS, with measurements taken every three years. Mortality data was obtained through follow-up in NHANES.

RESULTS

In GNHS, higher total circulating MUFA levels were linked with increased odds of CCA-CIMT progression, with a multi-adjusted odds ratio (OR) of 1.50(95% CI: 1.18-1.93) for the highest vs. lowest tertile. Specific MUFAs showed varied ORs: 0.73(0.58-0.92) for C16:1n-7, 1.59(1.25-2.03) for C18:1n-9, and 1.61(1.25-2.06) for C20:1n-9. Linear mixed-effect models indicated that mean differences in CCA-CIMT changes increased for total MUFAs, C18:1n-9, and C20:1n-9, but decreased for C16:1n-7, C22:1n-9, and C24:1n-9 over time. Metabolome scores (including Oxoglutaric acid, 3-Hydroxyisovaleric acid, Adipic acid, and Nonanoic acid) mediated 35.07% of the C16:1n-7 association and 17.18% of the C18:1n-9 association, while proteome (including UNC79, ApoC1, FINC, IC1, PGRP2, and ApoE) scores mediated 17.54% and 13.59% of the C18:1n-9 and C20:1n-9 associations. NHANES data indicated higher MUFA levels were associated with increased all-cause mortality, with multi-adjusted hazard ratios (HRs) for quintile 5 vs. 1 of 1.40(1.06-1.85) for total MUFA, 1.69(1.33-2.16) for C16:1n-7, 1.53(1.19-1.95) for C18:1n-7, and 1.30(1.00-1.68) for C18:1n-9.

CONCLUSIONS

Elevated total circulating levels of MUFAs, especially oleic acid (C18:1n-9), were associated with increased atherosclerosis progression and mortality risk, potentially mediated by metabolomes including Adipic acid, Nonanoic acid, and proteomes including UNC79, ApoC1.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP26_07

INVESTIGATING THE BIOLOGICAL EFFECTS OF CONSUMING A MULTI-FIBER DIETARY INTERVENTION IN AT-CARDIOMETABOLIC RISK INDIVIDUALS USING A COMPREHENSIVE MULTI-LEVEL PHENOTYPING APPROACH

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BACKGROUND AND OBJECTIVES

A more deleterious cardiometabolic risk profile has been associated with low gut microbiota richness. A relationship between gut microbiota richness and the diversity of consumed dietary fibers has also been reported. The consumption of a multi-fiber enriched bread for 2 months has been associated with improvements in insulin sensitivity and cholesterol profile, in parallel to modifications of gut microbiota composition and functions; however, the underlying mechanisms are not fully understood. This study aimed at 1) characterizing the effects of the multi-fiber dietary intervention on circulating metabolites using untargeted metabolomics and 2) identify multi-level regulations by combining metabolic, metagenomic and metabolomic data.

METHODS

In a randomized double blinded cross-over design, 39 at-cardiometabolic risk subjects consumed daily for 8 weeks 150g of standard bread vs. 150g of bread enriched with a 7-selected fibers mix (5.6g vs 16.4g of fiber respectively; 4-week washout). Before and after each intervention periods, plasma samples were analyzed using untargeted metabolomics. The identified metabolites were clustered into biological functions related to biological systems to ease data interpretation, completed by an enrichment pathways' analysis of individual metabolites to relate RESULTS to molecular regulations. Also, full data integration aggregating full metagenomic, metabolomic and metabolic datasets was performed.

RESULTS

Allocated from a total of 226 identified metabolites, 16 (over 57) biological functions (including metabolic disorders, inflammation/anti-oxidant, xenobiotics, energy metabolism) clustered in 6 biological systems (aspects of primary metabolism, vascular outcomes, xenobiotics processing, cell defense, microbial metabolic system and host metabolic systems) were differently impacted by the two breads and represented 60 biochemical pathways. Secondly, after the multi-fiber dietary intervention, multi-level co-regulations analysis between metabolomic, metagenomic and metabolic parameters showed a microbiota cluster as the possible starting point of concerted sequential regulations leading to reported improvement in insulin sensitivity and lipid profile.

CONCLUSIONS

Our deep-phenotyping approach revealed a broad and diversified biological effects induced by a multi-fiber bread consumption in at-cardiometabolic risk individuals, among which the microbiota regulation appeared as the starting point providing beneficial changes in cardiometabolic profile.

CONFLICTS OF INTERESTS

The clinical study was partly funded and sponsored by BRIDOR and I Dussous is employee of BRIDOR. The authors have no conflicts of interest to declare in relation to this work.

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SOAP26_09

CLUSTERING AND PREDICTING VERY SHORT-TERM NUTRITIONAL OUTCOMES FOLLOWING INITIAL DIAGNOSIS OF RESTRICTIVE ANOREXIA NERVOSA: A CROSS-DISCIPLINARY APPROACH

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BACKGROUND AND OBJECTIVES

No prior research has investigated the very short-term outcomes of restrictive anorexia nervosa (AN-R) in an outpatient setting. Predictive markers of early BMI progression remain insufficiently explored. The objectives of this study were to characterize BMI progression phenotypes in outpatients during the initial three months follow-up following diagnosis and to identify their biological and psychometric predictors.

METHODS

Data were collected from 130 female patients between 2017-2021. BMI trajectories were segmented into five profiles using K-Means clustering. Psychometric markers included DEBQ (restriction, emotionality, externality), EDI-2, and FRS-Q2 (Figure Rating Scale: subscale “ideal body silhouette”), while biological markers included prealbumin, IGF-1 and vitamin B12. ANOVA and Tukey post hoc tests assessed inter-cluster differences, then logistic regression and ROC analysis identified BMI evolution predictors.

RESULTS

Metric quality analysis of clustering indicated: a good intra-cluster homogeneity (Within-Cluster Sum of Squares (WCSS)=4.3); a balanced trade-off between cluster cohesion and separation, capturing the subtle BMI evolution patterns (Davies-Bouldin Index (DBI)=1.0; Calinski-Harabasz Index (CHI)=53.2). Five different BMI evolution profiles over three months were identified: C1 (Delayed progression), C2 (Continuous decline), C3 (High progression), C4 (Moderate progression), and C5 (Critical stagnation). 64% (n=83) patients demonstrated consistent favorable BMI progression, whereas 36% (n=47) experienced stagnation or decline. Higher IGF-1 level was a strong predictor of a better outcome at 1 month (AUC=0.821). Lower albumin levels (AUC=0.769) and higher FRS-Q2 scores (AUC=0.785) predicted a moderate, but consistent, BMI increase at three months. These two markers combined in a multivariate model showed strong predictive power (AUC=0.897). Lower DEBQ restriction scores (AUC=0.827) and higher FRS-Q2 scores (AUC=0.830) were also strong predictors of a significant and continuous BMI increase at three months. These last two markers combined in a multivariate model were confirmed as strong predictors (AUC=0.897; R^2(N)=62%, $p<0.05$).

CONCLUSIONS

BMI evolution in AN-R can be classified into distinct profiles with specific biological and psychometric predictors. Integrating these into tailored treatments may improve short-term outcomes. Future studies should refine models via interdisciplinary approaches for better individualized care.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP26_10

INFLUENCE OF TYPE 2 DIABETES RISK GENES AND FREE SUGAR INTAKES ON BIOCHEMICAL MARKERS OF GLUCOSE METABOLISM IN HEALTHY ELDERLY INDIVIDUALS

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BACKGROUND AND OBJECTIVES

Type 2 diabetes (T2D) has a strong association with genetic predisposition, involving both individual genes and multiple genetic variants that increase disease risk. This study aimed to investigate the influence of genetic polymorphisms and free sugar intakes in biochemical markers of glucose metabolism in individuals aged 65 and older, without T2D, and not taking oral antidiabetics.

METHODS

One hundred and ten volunteers were genotyped for eight polymorphisms in genes associated with T2D risk (*MCR4, TCF7L2, MTNR1B, GCKR, FTO, CDKAL1, IGF2BP2*) and high sugar intake (*FGF21*). Diet was assessed using 3 day records and blood samples were analyzed for fasting plasma glucose and glycated hemoglobin.

RESULTS

Average age was 69.5 years and 72.5% were women. Free sugar consumption was low (0,0 – 5,0 g/day) and plasma glucose levels and glycated hemoglobin were within normality ranges. Data analysis showed a significant relationship between the rs4402960 *IGF2BP2* genotypes and alterations in glycated hemoglobin (5,8 % GG, 5,7 % GT and 6,0 % TT, p=0.01). Additionally, differences in fasting plasma glucose levels were observed between rs10830963 *MTNR1B* genotypes (90,5 mg/dl (CG+GG) *vs*. 84,0 mg/dl (CC), p=0.04). There were no significant differences in free sugar consumption according to genotypes.

CONCLUSIONS

In healthy individuals aged 65 and older, genotypes for known T2D risk polymorphisms are not associated with higher levels of plasma glucose or glycated hemoglobin, except for rs4402960 *IGF2BP2 and* rs10830963 *MTNR1B*. These genes may serve for early identifiers of individuals at risk of TD2.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP26_11

GLYCEMIC CONTROL FOLLOWING A DIET HIGH IN SLOWLY DIGESTIBLE STARCH IN TYPE 2 DIABETIC PATIENTS

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BACKGROUND AND OBJECTIVES

Carbohydrate quality and its impact on glycaemia has been widely studied and it has been demonstrated that the glycemic response of starchy food can be reduced by selecting starches which are slowly digested. For this reason, we screened the starch digestibility of commercial starchy food products to design diets High in Slowly Digestible Starch (H-SDS diet) or Low in Slowly Digestible Starch (L-SDS). The objective of this work was to validate that consumption of H-SDS diet improves acute glycemic control in patients with type 2 diabetes (T2D).

METHODS

The study is a 12-weeks randomized, controlled, parallel study that evaluated the long-term metabolic impact of H-SDS and L-SDS diets in 51 subjects with T2D. The glycemic profile was monitored using a Continuous Glucose Monitoring System (CGMS). Glycemia peak, delta glycemia, incremental area under the curve (iAUC), total area under the curve (tAUC) for a 120- and 240-minutes interval after each meal were calculated. We analyzed the correlation between SDS or SDS/available carbohydrates and postprandial glycemic parameters applying a quadratic model followed by a linear model if no quadratic effects were observed. The model effects were: SDS and SDS2, or SDS/CHO and $(SDS/CHO)^2$, and subject as random effect.

RESULTS

The RESULTS indicate that the difference in SDS consumption between H-SDS diet and L-SDS diet is statistically significant (mean=63 ± 1 g/day for H-SDS and 17 ± 1 g/day for L-SDS; $p<0.0001$). Statistical analysis shows highly significant linear relationship between glycemia peak and MAGE in the SDS effect model ($p<0.0001$), as well as tAUC0-120. A quadratic effect of SDS was observed on MIME glycemia delta peak, iAUC 0-120 and 0-240.When evaluating ratio SDS/CHO, a linear effect of SDS/CHO is observed on glycemia peak, MIME glycemia delta peak and tAUC 0-120 and 0-240. SDS/CHO^2 effect is seen on MAGE and iAUC 0-240. Further analyses will be performed to better understand these effects.

CONCLUSIONS

A diet high in SDS shows positive effects on postprandial glycemic control in patients with T2D and could be considered as a strategy in dietary prescriptions for this population. In addition, the modulation of starch consumption is inexpensive and practical to employ by subjects with diagnosed T2D.

CONFLICTS OF INTERESTS

Alexandra Meynier is an employee of Mondelez R&DSophie Vinoy is an employee of Mondelez R&D

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SOAP26_12

NUTRITIONAL FACTORS IN PEOPLE WITH NEUROMOTOR DISABILITY UNDERGOING FLAP SURGERY FOR OSTEOMYELITIS ASSOCIATED PRESSURE ULCERS: AN INTERIM ANALYSIS OF A SINGLE-CENTER PROSPECTIVE OBSERVATIONAL STUDY

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BACKGROUND AND OBJECTIVES

People with neuromotor disability, particularly those with spinal cord injuries, are at high risk of osteomyelitis associated pressure ulcers. In our perioperative unity for disabled people, patients are treated by a musculocutaneous flap surgery with the help of a multidisciplinary team made of physical medicine and rehabilitation doctors, surgeons, and allied health professionals, including nutritionists. Although pressure ulcers are often associated with undernutrition, the risks of surgical failure in this context have not been sufficiently explored. The aim of this study is to identify the nutritional factors associated with surgical failure in this specific population.

METHODS

This prospective, single-center, observational study included adult patients with neuromotor disability admitted for flap surgery to treat osteomyelitis-associated pressure ulcers since February 2023. Nutritional data were collected from medical records, including structured data collection for nutritional assessment, anthropometric data and biologic data (at admission before surgery). Endpoints included success at 12 months (primary endpoint) and at 30-45 days (secondary endpoint). Associations between nutritional variables and surgical success were statistically analyzed. Failures are defined by skin breakdown, recurrence of pressure sores or local infection.

RESULTS

One hundred forty-six patients were included, aged 53 (16) years, and the majority of whom were men (116/146, 79%). Eighty-three per cent of patients had a spinal cord injury. Body mass index (BMI) was 25 (6). Albumin level was 32 (5) g/L and 25-(OH)-vitamin D levels was 20 [13; 27] ng/mL, both below the normal reference values. One hundred eleven (76%) were either malnourished (30/146, 21%) or at risk of malnutrition (81/146, 55%). One hundred fifteen (79%) patients were receiving renutrition, with or without nutritional supplements, including 97 (66%) receiving oral nutritional supplements. Only 71/146 (49%) met their protein and energy requirements. The prevalence of false dietary beliefs was 14%. Surgery success rates were 111/135 (82%) at day 30–45 and 45/56 (80%) at month 12. False dietary beliefs were associated with surgery failure at day 30–45 (p-value < 0.03).

CONCLUSIONS

False dietary beliefs appear to be a risk factor for failure in pressure ulcer surgery in this population. Targeted nutritional education and early identification of these beliefs may be strategic in improving therapeutic outcomes.

CONFLICTS OF INTERESTS

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SOAP26_14

CIRCADIAN HUNGER FEELING IN SUBTYPES OF ANOREXIA NERVOSA: HETEROGENEITY OF HUNGER FEELING IN ANOREXIA NERVOSA

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BACKGROUND AND OBJECTIVES

Anorexia Nervosa (AN) is an eating disorder characterized by self-imposed food deprivation, leading to undernutrition. The primary therapeutic goal is to help patients overcome self-starvation and achieve weight gain, with the regulation of hunger being a key factor. However, the knowledge on hunger perception in AN remains limited. Few studies have explored this area, and many conflate the distinct concepts of hunger feeling, wanting, and liking. This study aims to evaluate hunger feeling (HF) perception in patients suffering from AN over the nycthemeron, compared to a control group.

METHODS

HF perception was recorded over three days at eleven time points per 24-hour period using a validated Visual Analogic Scale (VAS) in 570 participants: 336 with restrictive AN (AN-R), 101 with binge-purge AN (AN-BP), 54 weight-recovered patients (AN-Rec), 28 with atypical AN (AAN), and 51 healthy volunteers (CON). Anthropometric, biological, metabolic and psychological parameters were also recorded.

RESULTS

HF perception followed a circadian rhythm, with three peaks before each meals, in all groups. Mean total HF perception was reduced in AN-R (9.2±0.4 vs. 11.7±0.8, p=0.02383) and AN-Rec (8.8±0.9, p=0.0239) compared to Controls. Distribution of HF perception in each AN groups was different from that of CON (AN-R: 10.5% of extremely high HF and 34.5% of extremely low HF, p=0.0001; AN-BP: 4% and 30.5% respectively, p=0.004; AN-Rec: 9% and 37% respectively, p<0.0001; AAN: 11% and 36% respectively, p<0.0001). Despite these differences, the majority of patients with AN accepted meals. Total VAS score was positively correlated with the age of the patients, the duration of the disease, the weight, the resting energy expenditure, B9 vitamins and osteocalcin plasma levels, DEBQ external eating, EDI2 bulimia, and EDI2 body dissatisfaction scores in AN groups. Total VAS score was negatively correlated with albumins, proteins, and B12 vitamin plasma level, DEBQ restrained eating, DEBQ emotional eating, EDI2 drive to thinness, EDI2 ineffectiveness, EDI2 interceptive awareness, EDI2 maturity fears, and BECK score in AN groups.

CONCLUSIONS

HF in AN is heterogeneous and does not seem to improve after weigh recovery. HF seems to be linked to psychological parameters rather than somatic ones. HF does not seem completely linked to meal acceptation. Phenotyping HF could be helpful to choose therapeutic approach.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP26_15

IMPACT OF OLIVE OIL AND MEDIUM- AND LONG-CHAIN TRIGLYCERIDES ON CARDIOMETABOLIC MARKERS, PLASMA METABOLOME, AND GUT MICROBIOME IN METABOLIC SYNDROME

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BACKGROUND AND OBJECTIVES

The type of cooking oil used is a crucial factor influencing dietary quality. In this study, we investigated the effects of medium- and long-chain triglycerides (MLCTs) versus olive oil (25–30 g/day) over six months on cardiometabolic health.

METHODS

In this 6-month double-blind, randomized controlled trial, 240 patients with MetS were randomly assigned to receive olive oil or MLCT oil (25-30g). The primary outcome was the changes of cardiometabolic markers. Secondary outcomes included changes in plasma metabolome and gut microbiome and their mediation effects on MetS indicators.

RESULTS

We report that both olive oil and MLCT significantly improve cardiometabolic markers, including reductions in body weight, waist circumference, BMI, body fat, and serum triglycerides (TG), alongside increases in android and gynoid muscle mass, without a decrease in total calorie intake. Notably, MLCT lowered diastolic blood pressure, while olive oil decreased fasting blood glucose levels. Mediation analyses revealed that the TG-lowering effects of both oils were mediated by distinct plasma lipoprotein profiles. Plasma metabolomics further identified increases in leucine (MLCT), and valine and ethanol (olive oil) as key modulators of improved lipid metabolism. Gut microbiota analysis demonstrated a rise in probiotic *Akkermansia* and *Enterococcus* species associated with reduced TG levels for both oils, with *Akkermansia* linked to increased plasma leucine and improved TG profiles. Moreover, *Ruminococcus*, enriched by MLCT, appeared to mediate lipid metabolism through HDL-4-TG. Baseline microbiome profiles predict weight loss in response to these oils better than plasma metabolome and clinical data.

CONCLUSIONS

Our findings highlight the differential impacts of olive oil and MLCT on the plasma metabolome and gut microbiota in metabolic syndrome, underscoring the role of baseline microbial profiles in determining anti-obesity efficacy.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 38 - FOOD SCIENCE, GASTRONOMY AND LIFE QUALITY

SOAP38_01

DEVELOPING THE GREEK BRANDED FOOD COMPOSITION DATABASE (HELTH): UPDATE AND EXPANSION METHODOLOGY

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BACKGROUND AND OBJECTIVES

Branded Food Composition Databases (BFCDs) are valuable tools to study the modern foodscape. In Greece, the first BFCD, Hellenic Food Thesaurus (HelTH), was developed in 2021 and included data for ~5,000 packaged foods through data collection from online supermarkets. The dynamic nature of the food market requires from BFCDs a constant update and expansion to match changes in the foodscape and, taking advantage of new tools, to meet high quality criteria.

METHODS

The first update of HelTH was carried out through field research in two phases from July 2023 to September 2024. The 'Composition and Labeling Information System' (CLAS) software was used to assist data collection and curation. From July to October 2023 (Phase 1), researchers indexed all branded foods available in four mega supermarkets in Attica from a major retailer. In phase 2, July to September 2024, food supplement data were collected from 16 pharmacies in Attica. Foods are categorized using LanguaL thesaurus to maintain consistency with HelTH's previous version and are described with EFSA's FoodEx2 system to align with international standards for food composition databases. Nutritional composition, ingredient lists, and qualitative information (claims, symbols, allergens, additives) were extracted for all products as shown on pack.

RESULTS

The updated version of HelTH includes data on 10.941 products, consisting of 8.952 packaged foods and 1.989 food supplements sold in the Greek market—44% more products than the previous version. To the existing HelTH's food categories were added new food groups including dietary supplements, baby foods, packaged fresh fruits and vegetables, coffee and tea, water, chewing gums, oils, vinegars, spices, and additives. A small proportion of foods (<25%) were discontinued between the two versions, while preliminary analysis does not provide evidence of extensive product reformulation. Tailored data collection strategies beyond the major supermarket chains are still required for the mapping of organic, traditional and special diet foods.

CONCLUSIONS

Regular data collection is a key element in the update and expansion of BFCDs. The systematic update of HelTH using a dedicated software increased the ease of data collection and curation, allowing for higher volume data and accuracy. In this newer version, HelTH further improves its value and impact as a comprehensive tool for the international research community, clinical and dietetic practice, the food industry and consumer.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP38_03

MODIFIED AMINO ACIDS IN MINIMALLY PROCESSED INFANT FORMULAS: IMPACT ON GUT MICROBIOTA AND METABOLITE PROFILE

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BACKGROUND AND OBJECTIVES

Diet plays a fundamental role in shaping the intestinal microbiota, especially during infancy when lactation or formula feeding is crucial for gut and systemic health. Modified proteins, such as those formed through the Maillard (glycation) reaction, alter the bioavailability of nutrients and impact the gut microbiome. These changes influence infant growth, gut metabolites, and their systemic effects. The production of short-chain fatty acids (SCFAs) by intestinal bacteria, essential for colonic health, depends on the availability of specific substrates like carbohydrates and amino acids. However, protein modifications during infant formula processing, such as the formation of Amadori compounds and dietary advanced glycation end-products (d-AGEs), may reduce nutrient utilization efficiency and potentially contribute to oxidative stress and inflammation. While Amadori compounds can serve as precursors for SCFA production, there is no evidence that d-AGEs can be metabolized into beneficial gut-derived metabolites.

This study aims to investigate how food processing-induced protein modifications, specifically those resulting from the Maillard reaction, influence the gut microbiota's ability to act as a bioremediator. By examining the interaction between modified dietary compounds and the gut microbiome, the research seeks to understand their effects on microbial activity, SCFA production, and overall gut health, with implications for optimizing infant formula composition.

METHODS

After conducting *in vitro* digestibility analysis and proteomic characterization of two minimally heat-treated experimental infant formulas with differing protein glycation levels, we evaluated the effects of their modified amino acids on the intestinal microbiota and related metabolites in weanling rats. These experimental formulas were compared with a commercial infant formula and an extensively hydrolyzed formula.

RESULTS

Statistical analyses revealed significant changes in the bacterial composition after two months of dietary treatment. Beta diversity was influenced by protein hydrolysis levels, resulting in variations of the relative abundances of specific taxa, such as *Intestinimonas*, and relative metabolite patterns.

CONCLUSIONS

These findings suggest distinct intestinal microbiota and metabolomics profiles due to protein hydrolysis and glycated amino acids intake in weanling rats.

CONFLICTS OF INTERESTS

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SOAP38_05

POTENTIAL OF BROWN ALGAE-BASED PRODUCTS AS SAFE ANTIOXIDANT AND PREBIOTIC DIETARY THERAPIES ACROSS THE LIFE CYCLE

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BACKGROUND AND OBJECTIVES

Regulating oxidative stress is crucial for healthy aging, yet aging and inflammation impair nutrient absorption (1). Brown algae, rich in mannitol and phenolic compounds, show promise as a prebiotic and antioxidant raw material for dietary therapy (1). However, they may contain high levels of sodium and heavy metals, which can compromise the safety of algae-based products (2). This study aims to explore the impact of gastrointestinal digestion on the bioaccessibility of minerals, mannitol, polyphenols, phlorotannins, and antioxidant capacity in brown algae products across the life cycle.

METHODS

Three brown algae (*Durvillaea incurvata*) products —sustainable powder extract reconstituted in tap water at sub cytotoxic concentration, micronized capsule, and cooked salad —underwent *in vitro* digestion using the static models for adults and older adults of INFOGEST to evaluate the impact of aging and matrix physicochemical characteristics on the bioaccessibility of minerals, mannitol, polyphenols, phlorotannins, and antioxidant capacity within these food matrices.

RESULTS

The bioaccessibility of mannitol, minerals, and phenolic compounds in brown algae products was significantly higher under adult gastrointestinal conditions, with increases ≥50% compared to older adults. Physiological changes with aging may impair the effective delivery of these compounds. After digestion, mineral levels slightly decreased probably due to a chelating effect from fiber. The extent of bioaccessibility varied by food matrix: mannitol and phenolic compounds increased up to 20-fold for powder extracts compared to cooked salads, while antioxidant capacity ranged from a 4.6% increase for cooked salads to a 29-fold increase for micronized capsules.

CONCLUSIONS

This study highlights the promise of brown algae products as antioxidant and prebiotic dietary therapies due to their high bioaccessibility of mannitol and phenolic compounds. However, the presence of minerals poses safety challenges, underscoring the need for further research to understand and control mineral content. Optimizing these products to enhance bioactive components while minimizing mineral levels will be crucial for their safety and efficacy across different age groups.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP38_06

FROM THE ISOLATION OF A PROBIOTIC STRAIN (LACTICASEIBACILLUS CASEI CNCM-I5663) TO THE CONCEPTION OF NEW FUNCTIONAL FINGER FOODS DEDICATED TO UNDERNOURISHED OLDER PEOPLE

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BACKGROUND AND OBJECTIVES

In 2050, ageing population will reach 35% of European population. The deleterious self-perpetuating vicious circle between undernutrition and sarcopenia precipitates the entry of elderly people into dependence and increases the risk of infection and mortality (1, 2). Based on the existence of a gut-muscle axis and the role of microbiota in supplying energy and defence to host (1, 2), we aim to isolate a probiotic strain that could protect muscle mass and that could be incorporated in protein-rich foods, especially dedicated to old people.

METHODS

The fecal sample of one patient with a short bowel syndrome (SBS) was used as a source of new strains, because we have shown the the gut microbiota of SBS is very rich in *Lactibacillacea* providing energy of host (3,4). The lactic acid strains from the SBS-patient faeces(5) have been screened with different sequential steps of selection, that include safety characteristics and a functional pipeline. The neamatode *Caenorhabditis elegans* model was used to select a strain able to protect muscle integrity. Then, 18 months aged rats (protocol n° 20374-2019060714134169V3) under moderate caloric restriction (75% of ad libitum), mimicking frail individuals were fed (or not) with selected bacterial strains. Body composition, muscle mass, insulin sensitivity (OGTT, HOMA-IR, insulin-signalling pathway in muscle) and signalization were assessed.

RESULTS

Lacticaseibacillus casei CNCM-I5663 strain promotes longevity and maintains the mitochondrial networks of wall muscles in *C. elegans*. The worms fed with strain CNCM-I5663 exhibited a fragmented mitochondrial morphology less rapidly than worms + OP50 (a referent strain) (45.3 % for CNCM-I5663 *versus* 78.5 % for OP50 at day 13, $p < 0.001$) and conserved a tubular mitochondrial morphology for a longer time (31.9 % for CNCM-I5663 *versus* 21.1 % for OP50 at day 4, $p < 0.001$). This strain improves insulin sensitivity (HOMA-IR after 2 months of supplementation with probiotic, ANOVA, $p=0.056$) and preserves the mass of the rats' hindlimb muscles by 12% compared to the restricted controls (ANOVA, $p<0.05$)(5). Given the beneficial properties of the CNCM-I5663 strain in protecting muscle mass, we have incorporated it into small cheese and finger foods rich in proteins.

CONCLUSIONS

Functional finger foods rich in proteins and probiotics are promising strategy to reinforce the nutritional intake of older persons.

CONFLICTS OF INTERESTS

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SOAP38_07

DETERMINATION OF THE NUTRITIONAL AND SENSORY PROPERTIES OF SRI LANKAN TRADITIONAL DIYABATH (FERMENTED COOKED RICE)

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BACKGROUND AND OBJECTIVES

'Diyabath', a traditional meal prepared from fermented cooked rice is commonly prescribed as a dietary therapy for gastro-intestinal track related ailments by indigenous medical practitioners in Sri Lanka. However, neither a complete nutritional analysis nor the specific health benefits of 'diyabath' have been thoroughly explored yet. The aim of this study is to analyze the nutritional composition, antioxidant capacity and sensory properties of 'diyabath' from three rice varieties in Sri Lanka.

METHODS

The cooked rice of three selected rice varieties; red (RR), parboiled (PR) and Ma vee (TR-a traditional local variety) were soaked in water and fermented overnight for 12 hours. A flavor infusion comprising of coconut milk, salt and local spices were added to the above at the end of fermentation. Samples of each 'diyabath' preparation were chemically analyzed for macronutrients, mineral composition, fatty acid profiles and antioxidant activity. Sensory quality evaluation of the three 'diyabath' preparations was performed by a panel of 52 members using a 9-point hedonic scale.

RESULTS

The protein, fat and carbohydrate percentages of 'diyabath' ranged from 1.3 ± 0.01 to 1.7 ± 0.04%, 0.37 ± 0.02% to 1.2 ± 0.00%, and 14.6 ± 0.00 to 14.9 ± 0.00 respectively. The percentage daily value (%DV) of protein per serving of 'diyabath' ranged from 6.1 to 8.8% which is appreciable for a non-dairy fermented food. Substantial amounts of iron and magnesium were reported in all three 'diyabath' recipes ranging from 1.58 ± 0.00 to 5.3 ± 0.1 (mg/kg) and from 57.6 ± 2.00 to 122.14 ± 2.1 (mg/kg) respectively. The %DV per serving of 'diyabath' for iron was in between 2 to 15% and for magnesium 3.15 to 8.78%. The predominant fatty acid present in all three 'diyabath' recipes was C12:0 Lauric acid which is the primary fatty acids found in coconut milk. Furthermore, 'diyabath' made from PR, RR and TR reported a high antioxidant capacity, 16.11 ± 0.54, 20.83 ± 0.42 and 20.68 ± 0.28 (mgTrolox equivalent/1g) respectively, comparable to or even exceeding those found in well-established antioxidant rich foods. In the sensory evaluation, the highest mean rank scores for the tested sensory attributes were observed in the 'diyabath' made from PR.

CONCLUSIONS

The RESULTS show that 'diyabath' is a rich source of important nutrients and antioxidants. Given its vegan-friendly composition and sustainable production from left over rice makes it a promising option for promoting both health and sustainable food practices. Further research is needed to optimize its preparation to maximize its value as a functional food.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP38_08

BEHAVIOR OF PROCESS-INDUCED CONTAMINANTS DURING IN VITRO DIGESTION OF PEA-BASED PRODUCTS

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BACKGROUND AND OBJECTIVES

In the context of more sustainable lifestyles, the use of vegetable instead of animal proteins has raised the question of replacing traditional ingredients, such as milk, meat, or even cereals, with legumes. These ingredients contain higher concentrations of precursors for the Maillard reaction, caramelization, and oxidation which, after high-temperature processing, could generate reactive dicarbonyl compounds and advanced glycation end-products (AGEs), potentially hazardous for human health.The first goal of this study was to investigate the formation, reactivity, and bioaccessibility of these newly formed process-induced compounds (NFCs) after cooking and during the digestion of a pea-based in comparison with a wheat-based cake product. Secondly, the influence of the food matrix structure on the digestion process and therefore on NFCs reactivity is also considered.

METHODS

A cake model based on a reconstituted flour containing pea protein isolate and maize starch was developed and compared with a wheat-based cake reference. Cakes were baked in an instrumented oven and submitted to the in vitro INFOGEST static digestion. Relevant analytes including dicarbonyl compounds, furanic compounds, and AGEs were extracted and quantified in the cakes and after the gastric and intestinal phases of the digestion using UHPLC-DAD, UHPLC-MS-QToF and HPLC-MS/MS. Cake structure and matrix organization was characterised as whole, ground powder and during the digestion.

RESULTS

Before digestion, among the NFCs tested, 3-deoxyglucosone and 5-HMF were most abundant. The pea-based formulation yielded higher concentrations of NFCs than the wheat-based one. During digestion, furanic compounds decreased, glyoxals and AGEs increased, while deoxyglucosones were more stable. Pea-based and wheat-based cake had slightly different structures and different macromolecular organization in the matrix; this had an impact on the release of NFCs precursors and on NFCs reactivity during the digestion.

CONCLUSIONS

At the end of the digestion, although the different NFCs behaved differently, their final amounts remained high. At each digestion step, NFCs concentrations resulted from an equilibrium between formation and consumption reactions determined by the different gastric and intestinal environments, cake composition, digestibility and structure.This line of research could, in future, contribute to the optimisation of industrial processes to limit the generation of NFCs during the production of legume-based processed food.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP38_09

SELECTING THE TYPE OF GRAINS AND PARTICLE SIZE DISTRIBUTION TO MODULATE STARCH DIGESTIBILITY AND GLYCEMIC RESPONSE

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BACKGROUND AND OBJECTIVES

Cereals and pseudo-cereals present a huge variety in term of shape and color but also of nutrition composition and starch structure. Acting on particle size and grain integrity may influence on the availability of nutrients and thus on their metabolic impact. We studied here the impact of different grains with different distributions of particle size on starch digestibility and on glycemic and insulinemic indexes in Humans.

METHODS

Rotary molded biscuits were made with gluten free flours acting both on the types of grains and the ratio between flours and groats. 8 types of biscuits were made: 4 products made with oat and brown rice flours and oat groats with different ratios of flours/groats (55/45, 65/35, 75/25 and 85/15). 4 other biscuits were made with fonio and sorghum used as flour or as grains in biscuits produced with a ratio of flours/grains of 55/45. Starch digestibility was measured in all products with Englyst method. Glycemic and insulinemic indexes (GI; II) and response parameters following consumption of these products were evaluated in humans. Product portions provided 50g of available carbohydrates. The study was performed on 12 healthy normal-weight subjects who tested all the 8 biscuits according to a cross-over design.

RESULTS

Starch digestibility analyses show high Slowly Digestible Starch (SDS) content in all the products (18 to 23 g/100g). In products containing fonio and sorghum, the SDS content was greater win products with grains compared to the one with flour (23 versus 19 g/100g for fonio and 20 versus 23 g/100g for sorghum). The macronutrient composition was overwise similar. GI values for all the products were low ranging from 49 to 36. II were between 45 and 56 keeping low insulin secretion.

CONCLUSIONS

The type of grains and the use of bigger size particle impact strongly starch digestibility and allows to get products with low glycemic and insulinemic indexes. Use of these gluten free grains and the use of bigger size particles would allow to modulate glucose metabolism and potentially lead to long term beneficial health effects.

CONFLICTS OF INTERESTS

Alexandra Meynier, Tiffany Sepanski and Sophie Vinoy are employees of Mondelez International R&D

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SOAP38_11

UNRAVELING THE ROLE OF FOODS AND RECIPES AS MODULATOR OF INFLAMMATORY RESPONSE IN “REAL LIFE” NUTRITION

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BACKGROUND AND OBJECTIVES
Diet may induce or prevent low-degree chronic inflammation, ubiquitous condition for all nutrition-related degenerative diseases. Despite in “real life” conditions, foods are consumed into a meal as recipes and undergo digestive processes, majority of the evidence are limited to single undigested food extracts highlighting a clear bias in understanding the RESULTS to deliver to Consumers. We aim to assess the role of 30 foods and 30 recipes, following digestive process, as modulator of *in vitro* inflammatory response in “real life” condition.
METHODS

A three-culture model was developed by co-culturing human CaCo-2 enterocyte-like and HT29-MTX-E12 mucus-producing goblet-like colon cells, then adding human monocyte THP-1 cells to the basolateral compartment. The inflammatory status was induced using 100 nM of phorbol-12- myristate-13-acetate (PMA) for 20 hours. Foods and recipe, previously processed and in vitro digested (Brodkorb *et al.* (2019) were added at 4 different concentrations to the apical section of the inflamed model for 4 h. Supernatants from the basolateral compartment were collected and analyzed for cytokines production (IL-6, TNF-α, IL-12p70, IL-18 and IL-8) using automated ELISA Simple Plex automated immunoassay. The anti-inflammatory drug Prednisolone was added as positive control.

RESULTS
Four different concentrations (D4, D3, D32, D1) of broccoli (BD), orange (OrD), sausage (SD) and pasta with tomato sauce and basil (PTD) have been analyzed. RESULTS showed the significant reduction induced by BD and OrD concentrations, ($p<0.05$ for BD and OrD on TNF-α and IL-6; $p<0.01$ for BD on IL-8) with respect to the control group. SD and PTD induced a significant reduction on TNF-α and IL-6 ($p<0.05$). Experiments with pasta, vegetarian, meat and fish recipes, processed foods as well as comparison between different procedure of cooking are currently ongoing and RESULTS will be presented at the Conference.
CONCLUSIONS
RESULTS shows the anti-inflammatory role of BD and OrD and suggest a modest activity for SD and PTD. Once all the food and recipes will be analyzed we will increase the knowledge about the association between diet, inflammation and wellbeing. Moreover, we will provide a valuable tool for nutritionists to optimize dietary advices to modulate inflammation as well as increasing consumer's awareness on the importance of anti-inflammatory foods and recipes.Funding:NextGenerationEU. Code: ECS00000041,CUP:C43C22000380007-VITALITY.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP38_13

PEAS IN THE SPOTLIGHT: EXPLORING THEIR ALLERGENIC POTENTIAL THROUGH A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

The increasing adoption of plant-based diets has raised concerns over the potential emergence of new food allergies, including those linked to alternative protein ingredients derived from peas (*Pisum sativum* L.). This study aims to evaluate current knowledge on immune-mediated adverse reactions to peas and to identify the specific proteins responsible for these reactions.

METHODS

The protocol (PROSPERO record: CRD42024612967) employs two complementary frameworks to address the research objectives. First, a Population-Outcome (PO) framework addresses the primary question: “What evidence exists that immune-mediated adverse reactions or allergies are caused by the ingestion of peas and pea-derived ingredients?” Second, a modified Population-Exposure-Comparator-Outcome (PECO) framework focuses on the secondary question: “Which pea protein molecules are recognized by the immune system and cause IgE-mediated allergies to peas and pea-derived ingredients?” Searches were conducted across three databases—MEDLINE (OVID), ISI Web of Science, and Scopus—using validated filters and agreed-upon search terms to identify relevant studies. Studies will be selected based on predefined inclusion and exclusion criteria. Risk of bias will be assessed using standard tools, and the quality of evidence regarding pea allergenicity was graded. Data synthesis involved both quantitative and qualitative methods, as appropriate.

RESULTS

From the three databases, 364 records were exported to the Rayyan platform, and duplicates were removed, retaining 201 papers. These papers are currently under review and are being screened based on the pre-defined inclusion and exclusion criteria. The study is expected to be completed by May 2025.

CONCLUSIONS

The outcomes of this systematic review will provide insights into the allergenic potential of peas and their derived ingredients, contributing to evidence-based decision-making in food production and labelling.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 51 - FOOD SCIENCE, GASTRONOMY AND LIFE QUALITY

SOAP51_01

SCALING UP THE STANDARDIZED PRODUCTION OF A FUNCTIONAL FOOD INGREDIENT FOR TARGETING GESTATIONAL DIABETES MELLITUS (GDM) BASED ON QUINOA PEPTIDES

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BACKGROUND AND OBJECTIVES

The production of potential antidiabetic quinoa peptides has been previously evaluated at a 1L processing volume. However, it is crucial to assess how scaling up the process impacts on both functionality a bioactivity, especially in the context of gestational diabetes mellitus (GDM), a condition with a high worldwide incidence. This research utilizes quinoa seeds, a recognized seed for its nutritional benefits, notably its protein content (~15%) and amino acid profile, as well as its ability to grow in diverse soil conditions, including low water availability. Evidence suggests that quinoa processing can yield bioactive quinoa peptide (BQP) with potential antidiabetic effects. **The objective** of this study was to produce and characterize quinoa peptides at 1L, 5L, and 25L of processing volumes and assess their bioactivity using antidiabetic protocols, including *in vitro* inhibition of dipeptidyl peptidase IV (DPP-IV) and *in-vivo* evaluation in a GDM mouse model (female mice fed a standard chow and high-fat diet (HFD) and treated with doses of 10, 50 and 100 mg/kg/day of quinoa protein hydrolysate.

METHODS

Quinoa peptides were produced by milling and sieving the seeds, followed by protein extraction by alkaline-acid method and hydrolysis with Alcalase 2.4L at three different production volumes (1L, 5L, and 25L). Physiochemically characterization focused on protein content, molecular weight, amino acid profile, surface charge, hydrophobicity, and peptide sequencing. Antidiabetic activity was assessed by *in vitro* DPP-IV inhibition and *in-vivo* oral administration in the GDM mouse model.

RESULTS

The RESULTS indicated that scaling up did not significantly affect the yield (71.4%±0.4% from quinoa seeds, $p>0.05$) of BQP (with a difference <5%). Physiochemically parameters were similar regardless of the processing volume. The protein content ranging from 70-75%, consistent with SDS-PAGE RESULTS showing similar protein bands. Key amino acids, including hydrophobic, cationic, and essential amino acids like leucine, were comparable, and the peptide lengths ranged mostly from 3 to 13 amino acids. In bioactivity, the in vitro inhibition of DPP-IV showed a slight decrease in their inhibition (IC50 1,29 vs 1,61 mg protein/mL, $p<0.05$). In the GDM mouse model, the 50 mg/kg/day dose of quinoa peptides showed a trend toward reduced glucose intolerance (15%) and fasting glucose (13%).

CONCLUSIONS

In conclusion, scaling up quinoa protein processing may serve as an effective modulator of glucose metabolisms, offering promise for the prevention of GDM.

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CONFLICTS OF INTERESTS

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SOAP51_02

IN VITRO DIGESTION OF POLYPHENOL-RICH FOODS: EFFECTS ON HYDROXYMETHYLFURFURAL (HMF) LEVELS

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BACKGROUND AND OBJECTIVES

Hydroxymethylfurfural (HMF) is a chemical compound formed during the thermal processing or storage of carbohydrate-rich foods. While small amounts of HMF are naturally present in foods and beverages, high levels have been associated with potential cytotoxic, genotoxic, and carcinogenic effects in vitro, raising concerns about its impact on health. This study aims to examine the changes in HMF levels before and after the *in vitro* digestion of polyphenol-rich foods and assess the potential role of polyphenols in modulating HMF levels during digestion.

METHODS

An in vitro gastrointestinal digestion model simulating the oral, gastric, small, and large intestine stages was used. Polyphenols (Aronia, Cornelian cherry, green tea, and Turkish coffee were subjected to this digestion process. HMF levels before and after digestion were analyzed using High-Performance Liquid Chromatography (HPLC).

RESULTS

When examining the HMF levels of polyphenols, it was found that Cornelian cherry reduced HMF the most both before and after digestion. Additionally, green tea was found to decrease HMF to the lowest extent compared to other polyphenols, both before and after digestion.

CONCLUSIONS

This study has shown that polyphenol-rich foods reduce HMF levels after in vitro digestion. The findings suggest that polyphenols may preserve their potential antioxidant properties during the digestion process, inhibiting HMF production and thereby supporting the positive health effects of food components.

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SOAP51_03

THE MEDITERRANEAN DIET: ASSESSING KNOWLEDGE AND PERCEPTIONS AMONG STAKEHOLDERS AND YOUNG ADULTS

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BACKGROUND AND OBJECTIVES

The Mediterranean Diet (MD) is widely regarded as one of the most beneficial dietary patterns for health and one of the most sustainable, emphasizing local and seasonal food production, environmental preservation, and the cultural heritage of Mediterranean communities. It is characterized by a high consumption of plant-based ingredients, olive oil as the primary fat source, moderate intake of fish and white meat, and limited consumption of red meats and sweets. Despite its documented benefits—including improved cardiovascular health, reduced disease risk, and positive effects on mental well-being—adherence to the MD is declining, particularly among younger generations. This study aimed to assess the perceptions and understanding of the MD among two key groups: stakeholders in food and agriculture-related sectors and young adults aged 17-25 across four Mediterranean countries (Portugal, Spain, Italy, and Turkey).

METHODS

A total of 40 co-creation (CC) group sessions were held: 20 with stakeholders from the fisheries and agriculture, food production, catering, nutrition and retail sectors and 20 with consumers, young adults (YA). The sessions, organised in each country's mother tongue, followed a standardised script to ensure consistency. Each session lasted 60 min and, in the first part, participants discussed key questions such as: What does the Mediterranean diet mean?; What ingredients and recipes are associated with the Mediterranean diet?; What flavours are most appealing within this dietary framework?

RESULTS

The YA participants highlighted MD as a diet based mostly on *Mediterranean Products* (77 times) and *Healthy facts* (67 times), but also referred to it as *Plant-Based*, *Varied* and *Balanced*. Stakeholders added to these topics that it is associated with *Culture*, *Lifestyle* and *Seasonal and local products*. In terms of ingredients, the 10 most mentioned foods included vegetables, olive oil, fruit, pulses and fish in all four countries. The recipes and flavours associated with DM varied from country to country, reflecting the cultural and culinary differences in food preparation. Despite this, the recipes indicated reflect the principles of DM.

CONCLUSIONS

The RESULTS show that although MD is well known, some concepts need to be better publicised, especially among YA, and recipes need to be adapted to current lifestyles, particularly in terms of ease of cooking. The importance of adapting this diet to the present day is related to the fact that it is a diet that promotes health and sustainability.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP51_04

NUTRA-COCO: CONSUMER PERCEPTIONS AND BEHAVIORS TOWARD MATURE COCONUT WATER AS A HEALTHFUL BEVERAGE

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BACKGROUND AND OBJECTIVES

Mature coconut water (MCW), often discarded as a by-product of the copra industry, is a significant underutilized resource, with an estimated 9.3 billion liters discarded annually in the Philippines. Consumers customarily prefer young coconut water (YCW) to MCW since the latter is bland and saltier. Past studies reported that MCW have bioactive properties, including flavonoids and abscisic acid, which exhibit anti-inflammatory effects. Also, MCW demonstrated potential in reducing blood glucose levels, improving insulin sensitivity, and enhancing liver function in diabetic animal models. Furthermore, Philippine MCW varieties contain potassium levels exceeding those of WHO-recommended oral rehydration solutions, underscoring their nutritional value.

METHODS

Given these health benefits from MCW, this study determined consumer perceptions and attitudes toward MCW as a viable health-promoting natural beverage. A survey involving 330 respondents (50 % male and 50 % female) from Metro Manila, Philippines, was administered online and in person.

RESULTS

Of the respondents aged 19 to 49, most were well-educated, with 81% holding college degrees, and more than half earned a monthly family income of PhP 19,040 to 66,640. Multiple correspondence analyses ($p < 0.05$) revealed that thirst, refreshment, enjoyment, taste, vitality, and energy were the primary motivators for natural beverage consumption. Respondents also preferred glass packaging and were willing to spend PhP 80–110 for a 250 mL MCW beverage, prioritizing availability and affordability as key purchasing factors. Moreover, participants ranked fresh fruit and vegetable juices as top choices based on the RESULTS of the point-biserial correlation analysis. RESULTS of the Wilcoxon Signed Rank Test ($p < 0.05$) showed that MCW was recognized primarily for its health benefits and nutritional and rehydration properties.

CONCLUSIONS

The study recommends incorporating natural flavorings and herbs to enhance sensory appeal and expand marketability. These findings highlight the demand for accessible, health-focused beverages and support the valorization of MCW to reduce food waste. With strategic product development and marketing, MCW can emerge as a competitive player in the natural beverage market.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP51_05

COMPARISON OF DAIRY AND PLANT-BASED LIQUIDS FOR ENHANCING LUTEIN ABSORPTION IN HUMANS: A CROSSOVER INTERVENTION STUDY

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BACKGROUND AND OBJECTIVES
Lutein, a carotenoid with anti-inflammatory properties, is abundant in spinach. However, lutein is highly susceptible to degradation, and most domestic cooking METHODSfor spinach significantly reduce its content. In contrast, preparing spinach as a smoothie enhances lutein release in an in vitro digestion model. The same model also indicated that the type of liquid used in smoothies significantly influences lutein dissolution. It remains unclear whether these effects on lutein dissolution also impact lutein absorption.
METHODS

This study aimed to determine whether different liquids affect lutein absorption in humans using a crossover design. Sixteen participants (50% female), aged 50–75, were recruited via advertisement. Exclusion criteria included chronic gastrointestinal diseases, regular supplement use, lactose intolerance, veganism, and allergies to intervention materials. Participants were randomly assigned to consume either dairy- or plant-based spinach smoothies over three visits, which were spaced at least one month apart. All participants abstained from carotenoid intake for 24 hours and fasted for 12 hours before each visit. During the first visit, participants consumed a control spinach smoothie (i.e., 85 g spinach blended with water). In the second and third visits, they consumed smoothies prepared with one of the experimental dairy- or plant-based liquids in randomized order. In the dairy group, high-fat cow's milk and high-fat yogurt were consumed, while soymilk and coconut milk were tested in the plant-based group. Plasma samples were collected every 2 hours for 8 hours post-consumption. Chylomicron lutein was isolated via ultracentrifugation (24,000×g, 120 min, 10°C), extracted using a 95% ethanol:hexane mixture (3:4), and quantified using high-performance liquid chromatography. Total absorption of individual carotenoids over 8 hours was compared between beverages within each participant. The study was approved by the national ethical authority.

RESULTS

Preliminary data showed that the plant-based and dairy-based smoothies resulted in 2.41- and 1.4-fold higher levels of absorbed lutein, respectively, compared to spinach juice (n=3 per category, both $p<0.0001$). Analyses are ongoing.

CONCLUSIONS
These perliminary RESULTS suggest that the consumption of smoothies may be a more efficient method to increase lutein availability.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP51_08

FISH OIL MITIGATES GLYCOLIPID METABOLISM DISORDERS INDUCED BY CHRONIC POTATO CHIP CONSUMPTION VIA THE GUT-LIVER AXIS

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BACKGROUND AND OBJECTIVES

Fried potato is associated with a global rise in metabolic diseases and raises substantial health concerns. However, limited studies have addressed adverse effects of fried potato diet and their prevention strategies. This study aims to uncover detrimental effects of long-term potato chip consumption on glycolipid metabolism and evaluate the protective role of fish oil supplementation.

METHODS

A 13-week feeding experiment was conducted using male C57BL/6J mice to evaluate the effects of long-term potato chip consumption and the effect of fish oil supplementation. The levels of fasting glucose, insulin resistance (HOMA-IR), and lipid profiles were measured. Histological analysis was conducted on liver, pancreas, and adipose tissues. Transcriptomic profiling of liver tissues was performed using RNA sequencing, while metagenomic analysis of gut microbiota and untargeted metabolomics of plasma and liver were carried out to investigate microbial and metabolic alterations.

RESULTS

RESULTS revealed that potato chip consumption significantly increases body weight, cholesterol, blood glucose, and insulin resistance, alongside liver, pancreas, and adipose tissue damage, which was ameliorated by fish oil intervention. Transcriptional analysis revealed that fish oil supplementation could ameliorate inflammation, gluconeogenesis, and lipid synthesis. Moreover, metagenomics and metabolomics uncovered that fish oil treatment improved gut health by evaluating the abundances of probiotics *Bifidobacterium pseudolongum*, *Lactobacillus reuteri*, and *Lactobacillus johnsonii* and raising hepatic docosahexaenoic acid, while reducing hypoxanthine and xanthine. The beneficial effect are attributed to the modulative role of fish oil supplementation in microbiota-derived enzymes, including L-lactate dehydrogenase (EC:1.1.1.27) and acetate kinase (EC:2.7.2.1), involved in gluconeogenesis and lipid synthesis. The benefit of the regulation of the role of the enzyme in the microorganism derivatives，which are included in L-Hydroxygenase（EC：2.7.2.1） and Ethylacetate enzyme（EC： 1.1.1.27），which are involved in fatty generation and fatty synthesis.

CONCLUSIONS

In conclusion, fish oil attenuates glycolipid metabolism disorders due to long-term potato chip diet, which could be mediated by the alterations in gut microbiome and hub metabolites linking gut to liver.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP51_10

TOFU TYPE "VEGETABLE MEAT" FROM LOCAL LEGUMES AS VALUABLE SOURCES OF PROTEINS AND MICRONUTRIENTS FOR SCHOOL CANTEENS

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BACKGROUND AND OBJECTIVES

In Côte d'Ivoire, one of the purpose of the school feeding policy is to fight against child malnutrition which prevalence was estimated at 23% according to data from demographic and health survey (DHS) in 2021. This school food policy is mainly based on using local agricultural production, in particular vegetables, cereals and legumes for the preparation of school meals. The aim of this study was to process two common local legumes (Vigna unguiculata or niébé and Vigna subterranea or voandzou) into tofu type vegetable meat and to assess their nutritional value for school-age children.

METHODS

For this study, one kilogram of each legume seeds were cleaned, washed in potable water and soaked overnight. The soaked seeds were mixed with water (1:2;w/v) and ground to obtain milk after filtration. The milk was then subjected to pasteurisation (80°C/3min) and citric acidic coagulation. Afterwards, the coagulum was extracted and pressed into solid blocks to obtain fresh tofu type vegetable meat. Proteins content and amino acid profile of vegetable meat from niébé and voandzou were determined by Kjeldahl and High Performance Liquid Chromatography methods, respectively. As for mineral composition, it was assessed by Atomic Absorption Spectrometry method. Oxalates and tanins content of vegetable meat were determined using standard method for antinutritional factors evaluation.

RESULTS

The production yield of fresh tofu type vegetable meat were 69.54±2.53 and 57.53±1.57% for niébé and voandzou, respectively. The proteins content varied from 14.06 to 15.09% and the amino acid profile highlighted predominance of isoleucine (0.75-0.80%), leucine (0.66-0.76%) and tryptophan (0.80-0.86%). The mineral content of tofu type vegetable meat were as follow: calcium (320-345 mg/100g), magnesium (53-55 mg/100g), iron (2.4-2.7 mg/100g) and zinc (1.6-1.8 mg/100g). Antinutritional factors of tofu type vegetable meat from niébé and voandzou showed low values of oxalates (0.10-0.12%) and tanins (0.11-0.14%) contents.

CONCLUSIONS

Tofu type vegetable meat produced from niébé and voandzou are considered as good sources of proteins and minerals and may be used in school canteens as fish substitute after processing in baked, smoked, roasted of fried form.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP51_11

CRACKING THE CODE OF AIR-FRIED POTATO CHIPS: THE EFFECT OF FISH OIL TREATMENT ON ADVANCING SAFETY, NUTRITION, AND FLAVOR ATTRIBUTES BY FOODOMICS-BASED PROFILING

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BACKGROUND AND OBJECTIVES

Potato chips are popular snacks known for their flavor and crispiness, but the thermal frying process can generate harmful contaminants and reduce essential nutrients. This study examines the potential of fish oil treatment to mitigate thermal processing contaminants and improve nutritional and sensory quality of potato chips, focusing on how thermal processing duration and fish oil treatment affect contaminants, bioactive compounds, and flavor attributes.

METHODS

Chemical profiling was conducted using UHPLC-Q-Exactive-HRMS to identify and quantify compounds, while ChemRICH analysis was used to evaluate chemical enrichment and highlight bioactive compound categories.

RESULTS

RESULTS showed that thermal processing significantly altered chemical profiles, including notable increase in indoles, pyridines, and pyrazines versus a significant decrease in cyclic amino acids and butyrates. Especially, the process induced the formation of harmful Maillard reaction products (hMRPs), such as acrylamide and furan, and reduced beneficial bioactive compounds, including γ-aminobutyric acid (GABA). Notably, fish oil treatment reduced the formation of hMRPs, preserved GABA, and enriched the chips with n-3 polyunsaturated fatty acids. Additionally, fish oil treatment decreased the levels of indoles and indoleacetic acids, thus reducing bitterness of chips and enhancing characteristic aroma of fish oil.

CONCLUSIONS

These findings suggest that fish oil use during air-based thermal processing may improve both safety and nutritional quality of potato chips and potentially enhance their sensory attributes. However, the oxidation risk of fish oil during frying should be considered. Future research should focus on how fish oil affects hMRPs, prevents oxidation, and optimizes thermal processing conditions to reduce the health risk of fried foods.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP51_14

DEVELOPMENT OF MICROBIOTA-DIRECTED FINGER MILLET (MDFM) PRODUCT FOR UNDERNOURISHED PRESCHOOL CHILDREN

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BACKGROUND AND OBJECTIVES

Background: Undernutrition remains a critical global health issue, contributing to nearly half of deaths in children under five. Beyond dietary insufficiency, the gut microbiota plays a pivotal role in modulating nutritional and metabolic health. Addressing undernutrition through microbiota-directed therapeutic approaches can be a promising strategy to enhance nutrient assimilation and metabolism. Finger millet, being a perfect blend of phenolics, dietary fibers, and micronutrients, holds potential to restore dysbiotic gut microbiota in undernourished children. This study aimed to develop a microbiota-directed finger millet (MDFM) premix and assess the sensory evaluations and acceptability of the same compared to existing wheat and rice-based diet (Balamrutham).

METHODS

Germinated finger millet (GPU-28 variety) and dates powder were used to reformulate the premix(F1) by replacing the existing Balamrutham blend(F2). Sensory analyses of various recipes (premix, laddu, idly, porridge, dosa) were conducted using a 5-point hedonic scale with untrained panelists, including mothers, teachers, and caretakers, at Anganwadi centers. Statistical analysis was performed using a t-test. Feeding trials were carried out for 2 weeks to assess acceptance and consumption rates among children.

RESULTS

The premix F1 achieved a superior mean sensory score of 4.8 ($p < 0.05$), with panelists strongly favoring its flavor, texture, and aroma. Among recipes, idly prepared with F2 demonstrated the highest overall acceptability ($p < 0.05$) due to its texture. In feeding trials, children consumed > 75% of each product, indicating high acceptability. Despite the control product receiving marginally higher scores in some attributes, both F1 and F2 formulations were well-accepted.

CONCLUSIONS

MDFM product has shown good acceptability supporting the feasibility of implementing this intervention. This premix is expected to exert promising gut-modulatory effects, contributing to improved gut health which will eventually support sustainable growth of these children. Randomised control trial on this product is warranted to know the efficacy.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP51_15

EFFECT OF AQUEOUS LEAVES EXTRACT OF MORINGA OLEIFERA ON SOME HEMATOLOGICAL PARAMETERS

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BACKGROUND AND OBJECTIVES

Despite advancements in modern medicine, rural communities in Nigeria continue to rely on *Moringa oleifera* for managing diseases such as diabetes and anaemia due to its therapeutic properties. This study aimed to find the effect of oral administration of aqueous leaves extract of *Moringa Oleifera* on hematological parameters in adult male Wistar rats.

METHODS
The experiment involved 20 male Wistar rats (180–200g), divided into four groups of five rats each. Group 1 (control) received water and standard rat feed. Groups 2, 3, and 4 were administered 150 mg/kg, 300 mg/kg, and 450 mg/kg of the extract, respectively, for 30 days. Data were analyzed using SPSS 20.0,Student's t-test and ANOVA. RESULTS were presented as Mean ± Standard Deviation (SD), with statistical significance set at $P < 0.05$.
RESULTS

The mean and SD of the effect of *Moringa Oleifera* on hematological parameters are presented in Table 1. For **PCV**, a non-significant decrease ($P > 0.05$) was observed in the low and medium dose groups, while the high dose group showed a non-significant increase ($P > 0.05$) compared to the control. **WBC** levels significantly decreased ($P < 0.05$) in all dose groups compared to the control. **Hb** and **RBC** showed a non-significant decrease ($P > 0.05$) across all dose groups relative to the control.

Table 1: Effect of *Moringa Oleifera* on Hematological Parameters (PVC, WBC, Hb, RBC)

Parameter	Group 1 (Control)	Group 2 (Low dose)	Group 3 (Medium dose)	Group 4 (High dose)
PCV	40.60±0.89%	38.00±2.12%	38.60±2.70%	41.20±3.19%
WBC	7970.00±97.47 × 103 / mm3	7100.00±158.11 × 103 / mm3	6560.00±610.74 × 103 / mm3	6760.00±270.19 × 103 / mm3
Hb	13.36±0.21 mg/dl	12.84±0.52 mg/dl	13.16±0.64 mg/dl	13.18±0.55 mg/dl
RBC	7.08±0.13 × 106 / mm3	6.48±0.50 × 106 / mm3	6.48±0.61 × 106 / mm3	6.50±0.58 × 106 / mm3

CONCLUSIONS

In conclusion, *Moringa oleifera* may decrease hematological parameters with consistent intake, suggesting it should be consumed in low quantities. This study provides a basis for determining safe dosage ranges for developing herbal products

Keywords: *Moringa Oleifera*, Hematological Parameters, Male Wistar rats.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 25 - GLOBAL HEALTH AND PLANETARY NUTRITION

SOAP25_01

Validation of two portion size estimation METHODSfor use with the Global Diet Quality Score application

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BACKGROUND AND OBJECTIVES

Measuring diet quality is crucial for policies and programs aimed at delivering better nutrition. The Global Diet Quality Score (GDQS) app collects data on diet quality by assessing portion size at the group level with ten 3D cubes of pre-defined size. Playdough (PD) was proposed as a possible alternative method. Unlike the other 24 food groups, the portion size categorization for the liquid oils food group is estimated by an algorithm in the GDQS app, based on the types of foods and dishes reported as consumed. The objective of this study was to assess whether the GDQS app using cubes or PD as the portion size estimation method with the GDQS app provided equivalent data to the GDQS metric estimated by participant-weighed records (WFR) for the same 24-hour reference period.

METHODS

The study was carried out with 170 participants 18 years or older. Each participant estimated foods consumed and portion sizes using: 1) WFR; 2) GDQS app interview with estimation by 2 methods, cubes and PD. The order of cubes vs playdough was randomized by respondent. The two one-sided paired t-test for equivalence (TOST) was used to assess equivalence between the GDQS-WFR and GDQS-cubes or GDQS-PD. *A priori*, the acceptable equivalence margin was defined as 2.5 GDQS points. The Kappa coefficient of agreement was used to quantify agreement between WFR and GDQS risk of poor diet quality outcomes (low, moderate, high) and food group consumption (low, medium, high, or very high) using the cubes or PD

RESULTS

The TOST showed that the GDQS-WFR and the GDQS-cubes or GDQS-PD were equivalent within the pre-specified bound of 2.5 points ($p=0.006$ for cubes and $p<0.001$ for PD). Both the cubes ($\kappa = 0.5685$, $p < 0.0001$) and the PD ($\kappa = 0.5843$, $p < 0.0001$) METHODSshowed moderate agreement with WFR when classifying individuals at risk of poor diet quality outcomes. Kappa coefficients showed substantial to almost-perfect agreement for the cubes and PD METHODSin comparison to WFR for 22 of the 25 GDQS food groups. Liquid oils showed much lower agreement ($\kappa = 0.059$, 27.7% agreement, $p=0.009$).

CONCLUSIONS

The GDQS app using the cubes or PD was equivalent to WFR in assessing diet quality as measured by the GDQS metric. These findings contribute to the growing body of research validating simplified tools for dietary assessment and pave the way for more frequent and accessible evaluations of diet quality to better inform policies and programs globally.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP25_02

METADATA DRIVEN DISCOVERY: A GLOBAL EFFORT OF DATA INTEROPERABILITY FOR HUMAN AND PLANETARY HEALTH

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BACKGROUND AND OBJECTIVES

The Periodic Table of Food Initiative (PTFI) is a pioneering global effort to create an open, publicly accessible database cataloging the world's edible biodiversity through multi-omics data, uncovering the vast and largely uncharted "dark matter" of food. A significant challenge with existing food composition datasets is the lack of interoperability, particularly for PTFI which integrates multi-omics data via a decentralized ecosystem of global partners. Standardized and structured metadata are critical to enhancing the power and usability of these datasets, ensuring they can be accurately aggregated, analyzed, and reused to generate meaningful insights into the intricate connections between food composition, health, and sustainability

METHODS

We developed the PTFI Core Metadata module, comprising 45 mandatory metadata elements1 designed to capture essential information about the food collection event (e.g., when and where the food was collected), the food specimen (a specific collected entity), and derived samples (from a parent specimen). The core metadata incorporate two widely recognized ontologies: the Food Ontology (FoodOn) and the National Center for Biotechnology Information (NCBI) taxonomy

RESULTS

The PTFI Core Metadata has been implemented and released in the PTFI database MarkerLab2, alongside multiomics data from 500 foundational foods analyzed to date. The collected metadata enable comparison of variation in food composition between 182 biological species across 65 food families. Additionally, metadata enable comparison between different treatments, such as processing method (e.g., raw, processed, cooked) from 36 species; comparison of varying production systems (e.g., conventional, organic, wild, farmed, grain-fed, grass-fed) from 34 species; and comparison of diverse sources (e.g., field, fresh market, supermarket) across 32 species. For finer resolution metadata of field-harvested foods, we are developing an expansion module to capture agricultural practices linked to variations in food composition, ensuring scalability across food systems and applications

CONCLUSIONS

Our standardized metadata framework bolstered by the power of community-maintained ontologies not only facilitates data sharing and interoperability but adds context to the PTFI multiomic food data, promoting a more dynamic global platform for diverse users seeking to elucidate the nutritional "dark matter" of food

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

1. 2. Periodic Table of Food Database on MarkerLab®. https://ptfi.markerlab.com/ [Accessed December 12, 2024]

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2. 1. Laporte M-A. marieALaporte/PTFI_application_profiles. (2023) https://github.com/marieALaporte/PTFI_application_profiles [Accessed January 24, 2025]

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SOAP25_03

UNEQUAL PLATES, UNEVEN HEALTH: EXAMINING NUTRITION DISPARITIES IN RURAL AND URBAN INDIA

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BACKGROUND AND OBJECTIVES

Nutrition status and health are the ultimate outcomes of dietary diversity that determine human capital quality. With changing dietary patterns in rural-urban India, the present study examines the effect of dietary diversity on nutrition status and health outcomes, followed by prioritizing regions for improvement.

METHODS

Data marshaled from the National Sample Survey Office and the National Family Health Survey was used to construct the dietary diversity index (DDI) using Simpson's approach, the nutrition status index (NSI) using per-capita nutrients intake, and the health outcome index (HOI). NSI and HOI were estimated using the principal components approach. Multivariate regression was executed to capture the causal effect of DDI on NSI and HOI. Finally, biplot analysis was done to prioritize regions for better nutritional status and health outcomes.

RESULTS

Dietary diversity indicated that most Indian states consume less/moderately diversified foods. Calorie intake witnessed significant reductions over time, corroborating its linkage with dietary diversity. Per-capita protein-intake remained steady, whereas fat-intake increased and was higher in urban-India. Concerning children's health outcomes, stunting increased in coastal states during 2019-20 relative to 2015-16. Wasting increased in Andhra Pradesh, Assam, and Bihar. Underweight increased in Kerala, Andhra Pradesh, Assam, West Bengal, and Gujarat. Overall, malnutrition (HOI) increased across regions. Men whose body mass index (BMI) is below normal decreased across regions, and obesity increased in all. Women whose BMI is below normal decreased, and obesity increased in the majority. Anemic pregnant women increased majorly in southern states. Regression indicated a significant causal relationship between DDI and NSI/HOI. Regional prioritization registered a strong linkage between DDI, NSI, and HOI.

CONCLUSIONS

The dietary diversity level is low in most regions, which is reflected in the nutritional status and health outcome level, especially in children and women. It is suggested to reduce the inequality and variation accompanied by increasing the composition of fooditems in the consumption basket, especially by spending more on nutrient-dense commodities.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP25_04

USING MID-UPPER ARM CIRCUMFERENCE (MUAC) Z-SCORE TAPE FOR COMMUNITY PEDIATRIC NUTRITION RISK ASSESSMENT AND MONITORING: EXPERIENCES AND LESSONS FROM SOUTHWESTERN KENYA

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BACKGROUND AND OBJECTIVES

In 2023, Community Health Volunteers (CHVs) and the Ministry of Health (MoH) staff were trained to use the novel MUAC z-score tape for household anthropometric measurements in southwestern Kenya as part of a randomized controlled trial titled ALIMUS-We are Feeding! In this qualitative sub-study, we aimed to understand the experiences and lessons learned from using the MUAC z-score tape for screening and monitoring.

METHODS

Focus Group Discussions (FGDs) were used to explore the experiences of CHVs and MoH staff, who used the MUAC z-score tape for the nutrition screening of 617 children aged between 23 and 59 months. Two FGDs were conducted with CHVs (n=14) and one with MoH staff (n=7). Trained facilitators led discussions using a semi-structured interview guide in Luo and Swahili. FGDs were recorded, transcribed, translated, and analyzed using thematic analysis.

RESULTS

Broad emerging themes included the acceptability of the MUAC z-score tape, perceived areas of improvement, and barriers to using the new tool for household nutrition screening. Participants had a positive opinion of using the MUAC z-score tapes emphasizing the expanded age categories, the inclusion of the age-specific z-scores, and additional color-coding for nutritional status. Barriers to using the MUAC z-score tape included the tape's durability and the font size of the markings on the tape. Acceptability for use at health posts by MoH staff was impacted by a lack of awareness and understanding of the novel information provided by the tape. Buy-in from community members proved essential to the screening process.

CONCLUSIONS

The findings highlight how enhancements to the MUAC z-score tape could facilitate community-based nutrition screening and monitoring. They also underscore the critical role of frontline community health workers in shaping the implementation of public health programs and the importance of providing proper training to such staff before community-level program implementation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP25_06

PREVALENCE OF STUNTING IN CHILDREN UNDER FIVE YEARS IN INDONESIA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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BACKGROUND AND OBJECTIVES

Stunting, a growth disorder defined as a height-for-age below two standard deviations of WHO reference standards, is mainly caused by inadequate nutrition and recurrent infections during the first 1,000 days of life. Indonesia has the second-highest rate of stunting among children under five in ASEAN countries, yet the exact prevalence across its provinces has not been comprehensively reported, which is crucial for evaluating the success of national and provincial programs.

METHODS

Four electronic databases (PubMed, CINAHL, EMBASE, and the GARUDA database) were searched without any language or year restriction for relevant articles from their inception to October 2024. Studies investigating the prevalence and associated factors for stunting in children under five in Indonesia were included

RESULTS

A total of 67 studies were included. The findings revealed that the included studies covered 22 of 34 provinces in Indonesia and the overall pooled prevalence of stunting in children under 5 years was determined to be 38.7% (95% CI: 35.4%–42.1%.) Publication bias was not detected while the sample size influenced the heterogeneity between the studies. Multiple related factors, including the child's sex, visits to community health centers, carbohydrate and protein intake, immunization status, vitamin A supplementation, and birth weight, demonstrated significant variation in the pooled prevalence.

CONCLUSIONS

The findings of this study address stunting in children under five by adopting a multifactorial approach, emphasising the importance of diet and micronutrient supplementation, healthcare access, and immunisation, alongside ongoing monitoring and interventions tailored to the specific needs of children.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP25_07

PHYSICAL ACTIVITY LEVEL, NON-AEROBIC FITNESS AND BODY COMPOSITION IN VEGETARIAN AND OMNIVOROUS ADULTS: A COMPARATIVE ANALYSIS OF A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

Despite the numerous health benefits of a plant-based diet, poor health outcomes can arise from an unbalanced diet. Although plant-based diets and vegetarianism are becoming increasingly popular, relatively little data remains on the link between vegetarians and omnivorous counterparts between diet type, physical activity, fitness and body composition.

METHODS

A total of one hundred and ninety-three Malaysian adults participated, with a mean age of 41.9 ± 13.4 years. The participants were categorised as vegetarians (V) (n=106) and omnivores (O) (n=87). Self-administered questionnaires were distributed to all participants, and their physical activity level data were assessed using the Global Physical Activity Questionnaire (GPAQ). Body composition measures [BMI, body fat mass, fat-free mass, visceral fat level, and body fat percentages] were calculated using a bioelectrical impedance analyser (BIA). The hand grip test was used to assess muscular and hand strength using a hand dynamometer. The non-aerobic aspects of physical fitness (muscle strength/power, flexibility, balance, and body composition) were assessed using the sitting-rising test (SRT).

RESULTS

Four categories of vegetarian diets have been identified: vegan (23.5%), lacto-ovo (53%), ovo (4.9%), and lacto (18.6%). There were no differences by ethnicity (Chinese: V: 57.5%; O: 59.8%; Indian: V: 42.4%; O: 40.2%) or sex (male vs female: V: 34.9%, 65.1%; O: 44.8%, 55.2%). Vegetarianism was practised for an average of 15.8 ± 13.6 years. Physical activity, handgrip strength, and SRT did not significantly differ between vegetarians and omnivores ($p > 0.05$). There was a significant correlation ($p < 0.05$) between the body composition variables (body fat mass, fat-free mass, visceral fat level, and BMI). Nonetheless, there was no discernible difference in body fat percentages between vegetarians and non-vegetarians ($p > 0.05$).

CONCLUSIONS

Although dietary patterns varied significantly between groups, with vegetarians consuming fewer animal-derived products and more plant-based foods, linear regression analysis revealed no differences or associations between dietary patterns, body composition, physical activity levels, and non-aerobic fitness. These findings emphasise the need for further research to elucidate the specific impact of dietary patterns on body composition, physical activity, and fitness levels. An appropriate health education programme on healthy eating is required based on preferences from the five major food groups.

CONFLICTS OF INTERESTS

working with industry research projects and consultation

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SOAP25_08

STRENGTHENING SALT REDUCTION POLICY FOR MALAYSIA THROUGH MAXIMUM SALT TARGETS OF SELECTED FOOD GROUPS: ENGAGEMENT WITH INDUSTRY STAKEHOLDERS

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BACKGROUND AND OBJECTIVES

In 2013, the WHO recommended that all member states aim to reduce population salt intake by 30% by 2025. Since then, more countries, including Malaysia, opted for structural or regulatory approaches. Setting maximum salt targets for food industries to adhere to is one of the strategies. Thus, this study has been conducted to set a maximum salt targets for specific food categories and evaluate the stakeholder, ie. food industry responses.

METHODS

Following a stepwise approach by Dawns et al. (2015) for setting national salt targets, this study systematically proposed maximum salt targets for 14 food categories under the Food Regulation 1985. The steps involved: (1) identifying major contributors to dietary salt; (2) selecting target food categories; (3) establishing target levels, and (4) engagement with food industry stakeholders.

RESULTS

In Step 1, secondary data from the 2019 Malaysian Community Salt Survey revealed a mean salt intake of 7.9 g/day in adults, with the major contributor to salt intake being cooked food (meals prepared outside home). Salt levels in foods were also obtained from previous market surveys on sauces, instant noodles and street foods conducted between 2017 to 2021. A total of 14 food categories identified under the Food Regulation 1985 were selected for salt target setting, based on their contribution to dietary salt intake and their inclusion in the ongoing revision of the Malaysia Food Act 1983 (Step 2). Literature reviews and discussions led to proposing the 75th percentile of sodium levels as the maximum salt target, which was then revised based on consumption data (Step 3). An engagement with 40 representatives from food industries indicated mixed opinions and emphasised the needs for supports on technology and training for reformulation.

CONCLUSIONS

This study has established maximum salt targets for 14 food categories, through a step wise approach, paving the way for mandatory or voluntary policy interventions. Nevertheless, the acceptance among food industries was a concern; of which continuous supports is detrimental. There is a need to further evaluate the success of the implementation through periodically monitoring and engagement with the stakeholders.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP25_11

LOW TRANSFERRIN LEVELS ARE ASSOCIATED WITH MORTALITY IN KENYAN CHILDREN WITH SEVERE ACUTE MALNUTRITION

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BACKGROUND AND OBJECTIVES

Severe acute malnutrition (SAM), characterized by severe wasting (marasmus) or nutritional oedema (kwashiorkor), is associated with high mortality, even with management according to WHO guidelines. We hypothesized that disruption of iron status, leading to increased risk of bacteraemia, may underlie high mortality in children with SAM.

METHODS

We analysed integrated clinical and laboratory data from 111,703 paediatric admissions between August 1998 and June 2024. Transferrin and other biomarkers of iron status were longitudinally assessed in Kenyan children with SAM at admission (n=362), and 7 (n=210) and 14 (n=149) days post- admission, and among underweight (n=437) and nourished (n=2,280) community children from Kenya, Uganda, Burkina Faso and The Gambia.

RESULTS

Children with SAM had a two-fold increased risk of bacteraemia and mortality compared to those without SAM (adjusted odds ratio (aOR) 2.1 [95% CI 1.9, 2.2]; P<0.0001). Admissions with kwashiorkor had a 54% increased risk of bacteraemia (aOR 1.5 [1.4, 1.7]), and a 45% increased risk of mortality (aOR 1.4 [1.3, 1.6]) compared to those with marasmus. Specifically, children with kwashiorkor had a 2.5-fold or more increased risk of *Escherichia coli* and *Klebsiella pneumoniae* bacteraemia, and had lower transferrin levels (0.8 g/L [95% CI 0.7, 0.9]) than those with marasmus (1.9 g/L [1.7, 2.1]; P<0.0001) or community children (2.7 g/L [2.6, 2.7]; P<0.0001). Each 1 g/L decrease in transferrin levels was associated with an 87% increased risk of mortality (aOR 1.87 [1.32, 2.64, 2.86], P=0.0003) and mortality increased exponentially as transferrin levels decreased below 1.5 g/L. Kwashiorkor was also associated with higher transferrin saturation and lower hepcidin, albumin, and soluble transferrin receptor levels compared to marasmus or community-based children.

CONCLUSIONS

Low transferrin may be a risk factor for bacteraemia and mortality in SAM patients, and the risk increases along a continuum of decreasing transferrin levels. Further studies are needed to elucidate the underlying biological mechanisms linking low transferrin levels to poor outcomes, and potential interventions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP25_12

IMPACT OF HOUSEHOLD USE OF MULTIPLE MICRONUTRIENT-FORTIFIED BOUILLON CUBES ON CHILD DEVELOPMENT OUTCOMES AMONG CHILDREN 2 TO 5 YEARS OF AGE IN NORTHERN GHANA

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BACKGROUND AND OBJECTIVES

Many children in low- and middle-income countries are at risk of not reaching their developmental potential, in part due to malnutrition. Micronutrients are required for brain development; interventions to improve micronutrient status may improve developmental outcomes among children. This study examined the impacts of household use of multiple micronutrient-fortified bouillon cubes, compared to a control bouillon cube, on selected child development outcomes.

METHODS

Children 2-5 y (n=689) were recruited from 14 rural and 14 urban/semi-urban clusters in northern Ghana for the CoMIT Project (NCT05178407), a double-blind household-randomized controlled trial. The intervention cube intervention cube was formulated to provide 200 ug vitamin A, 80 ug folic acid, 1.2 ug B12, 4mg iron, 3 mg zinc per day; both intervention and control cubes contained 30 ug/g iodine. Study cubes were delivered to households every two weeks for 9 months. Child development was assessed prior to randomization (baseline) and at the end of the intervention. We used the Malawi Developmental Assessment Tool (MDAT) to assess gross motor, fine motor, personal social and language development, and the Early Years Toolbox Go/No-Go Task (EYT GNGT) to assess inhibition. For each outcome, minimally-adjusted (controlling for baseline values, recruitment site, and child age and sex) and fully-adjusted (controlling for additional pre-specified covariates significantly associated with the outcome) ANCOVA models were used to estimate endline mean differences between the intervention and control groups.

RESULTS

Of 670 children randomized, 637 completed the endline MDAT and 633 completed the endline EYT GNGT. Children enrolled in the intervention group had greater endline age adjusted z-scores for language development (1.11 vs. 0.95 mean; p = 0.004) and gross motor development (0.75 vs. 0.69; p = 0.015). However, personal social, fine motor and inhibition scores did not differ between groups at endline.

CONCLUSIONS

The intervention of household use of multiple micronutrient fortified bouillon cubes had a small positive effect on language and gross motor development outcomes. The magnitude of the impact was analogous to ~1 IQ point, which is similar to the impacts of other nutrition interventions on child development outcomes. This indicates the potential for bouillon fortification to improve some child development outcomes among pre-school age children. Further research is necessary to understand potential pathways of impact.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP25_13

EFFECTIVENESS OF CONTEXT-ADAPTED IMPROVED DIET AND COUNSELING ON RECOVERY OF CHILDREN FROM MODERATE ACUTE MALNUTRITION (MAM) IN BANGLADESH: A CLUSTER RANDOMIZED CONTROL TRIAL

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BACKGROUND AND OBJECTIVES

Supplementary feeding programs with standardized nutritional supplements are routinely implemented for the management of MAM in humanitarian contexts. In its latest guideline on acute malnutrition, the WHO however called to revisit the role of nutritious home food as an integral part of the prevention and management of MAM, and to assess the efficacy of different approaches to dietary management of moderate wasting, including the use of available home foods in different contexts (1). Accordingly, we sought to evaluate the effectiveness of an approach based on improved nutritional counseling (INC) and home food fortification in the management of MAM children aged 6-59 months, in rural Bangladesh.

METHODS

We conducted a two-arm cluster RCT in 20 community clinics in Teknaf sub-district. In the intervention arm, 280 child-caretaker dyads received INC, cooking demonstration of traditional recipes and 15-micronutrient powder sachets, every two weeks. In the control arm, they received a nutritional supplement (WSB++). The duration of MAM management was set at 4 months, followed by a 6 months follow-up period. Anthropometry, morbidity and adherence were recorded at each visit. Primary outcomes were recovery rate, time to recovery, rate of weight gain and nutritional status after 4 months. We studied the effect of intervention using regression models adjusted for clustering and baseline characteristics.

RESULTS

Of the 560 children enrolled in the study, 3.8% (21/560) defaulted or were lost to follow-up before the end of the treatment period. At the end of the 4-month period, 57.0% (307/539) were no longer acutely malnourished, and 2.8% (15/539) deteriorated to severe acute malnutrition. We found no statistically significant difference between treatment groups in recovery rates, nor in nutritional status achieved after 4 months. Adjusted analyses showed that rates of weight gain, of 1.53 g/kg/day in the control group and 1.34 g/kg/day in the intervention group, were unaffected by the type of treatment received (p=0.326). Post-treatment RESULTS were also similar between treatment groups.

CONCLUSIONS

Our study shows that an alternative approach to MAM management can be as effective as a classical program using a standardized nutritional supplement. In future analyses, we will assess the levers and barriers to the effectiveness of the different approaches, as well as their cost-effectiveness. Further studies in other contexts are required to investigate the promising prospect of managing MAM by improving access to nutritious foods at home, or by fortifying foods at home, rather than by administering nutritional supplements.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP25_14

LESS IS MORE: THE SENTINEL FOOD APPROACH FOR MEASURING FOOD GROUP CONSUMPTION

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BACKGROUND AND OBJECTIVES

Food group-based questionnaires collect data on consumption of food groups to construct proxy indicators of quantitative intakes, such as the minimum dietary diversity for women (MDD-W). How to collect valid food group data requires careful inquiry. The objective of this study was to test whether a short list of commonly-consumed "sentinel" foods can accurately capture consumption of each food group at population level.

METHODS

Quantitative dietary intake survey data from an initial 10 countries (Bangladesh, Brazil, China, Colombia, Ethiopia, Mexico, Netherlands, Switzerland, United Kingdom, United States) were analyzed, supplemented with 27 additional countries from Europe that had national dietary intake surveys. Each food item was classified into the 29 food groups of the Diet Quality Questionnaire (DQQ), and assigned a generic item name; e.g. short-grain rice and long-grain rice are both called "rice". For each country, items were ranked by number of unique people consuming each item. The cumulative percentage of people consuming the food group was tabulated to identify the number of items needed to capture 90%, 95%, 99%, and 100% of people who consumed each food group.

RESULTS

Across countries, a mean of 3 food items per food group were required to capture ≥95% of people consuming the food group, ranging from an average of 1 item (eggs) to 9 items (other fruits). The number of items varied by country; for example, 12 "other fruits" captured 95% of consumers in Colombia, while only 4 were required to capture 95% in Ethiopia. Summing the number of sentinel foods required for all 29 food groups of the DQQ, an average of 79 food items captured ≥90% of people consuming each food group; 100 items captured ≥95% of people; 143 items captured ≥99% of people, and 239 items captured 100% of people.

CONCLUSIONS

Food group consumption can be measured accurately at population level using short lists of sentinel foods, and does not require an exhaustive food list. Careful identification of the most commonly-consumed items is important for the validity of the sentinel food method. A global collective effort of >1,000 people has identified an average of 126 sentinel foods per country in 140 countries, which have been used in collecting dietary data in the Gallup World Poll and the Demographic and Health Surveys since 2020.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP25_15

PLANETARY HEALTH DIET AND MICRONUTRIENT INTAKE ADEQUACY IN AN ADULT COHORT

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BACKGROUND AND OBJECTIVES

The Planetary Health Diet (PHD) is a novel dietary pattern and presents similitudes to the Mediterranean Diet (MedDiet). Our study aimed to investigate and compare the association between adherence to a priori PHD index and two well-known Mediterranean indexes, and micronutrient intake adequacy.

METHODS

We assessed 18259 participants at baseline with a validated semi-quantitative food frequency questionnaire. Inadequate intake of 19 micronutrients was evaluated using the estimated average requirement (EAR) cut-point approach and the probabilistic approach. Logistic regression analyses were conducted to estimate the probability of failing to meet EAR for ≥ 3 micronutrients.

RESULTS

Overall, subjects in the higher adherence quartile of the PHD and MedDiet had a lower risk of overall inadequacy. The adjusted OR for failing to meet ≥ 3 EAR was 0·24 (95% CI 0·21-0·27) for the PHDI, 0·12 (95% CI 0·11-0·13) for Mediterranean Diet Adherence Screener, and 0·09 (95% CI 0·08-0·10) for Mediterranean Diet Score (fourth v. first quartile) using the probabilistic approach method. Our findings showed that greater adherence to the PHD was associated with a lower risk of micronutrient inadequacy, although the MedDiet proved to have better nutritional adequacy by far.

CONCLUSIONS

It would be best when recommending the PHD to prioritize nutritionally dense foods, such as those that conform the MedDiet pattern.

CONFLICTS OF INTERESTS
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SOAP25_16

THE WORLD FOOD MAP: A TOOL FOR UNDERSTANDING BIOCULTURAL FOOD DIVERSITY FOR RESILIENT AND SUSTAINABLE FOOD SYSTEMS

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BACKGROUND AND OBJECTIVES

Diets worldwide often lack the diversity needed to meet nutrient needs and protect against disease. Investing in sustainable food systems is crucial to ensure access to diverse foods that support health, culture, and biodiversity. Neglected and underutilized species (NUS) have been overlooked despite their nutrient density, climate resilience, and cultural significance, offering solutions to challenges in nutrition, sustainability, and food equity. This research aims to map common and NUS globally in an accessible online format to support investment in sustainable food systems and biocultural diversity.

METHODS

Commonly consumed foods from over 100 countries, identified from over 1,000 key informant interviews done by the Global Diet Quality Project in 2021-2024, were mapped onto each country, organized by food groups. A scoping review, landscape analysis, and expert consultations were conducted in collaboration with leading botanical research institutions to identify and classify additional edible species and NUS. These species were mapped across global biomes. New food composition analysis on NUS is carried out by the Periodic Table of Food Initiative (PTFI). Geospatial mapping tools and global datasets are used to map these pieces of information.

RESULTS

The World Food Map includes over 1,500 commonly consumed foods. These are mapped by country, showing regional patterns of common food consumption. Based on consultation with botanical researchers, biomes and primary and secondary crop centers of origin were identified as the key layers onto which each NUS are mapped. Food composition data for these priority species reveals an array of health-related compounds, in addition to nutrients. Priority NUS in 10 focus countries were selected as strong candidates for investment in sustainable food systems to support diverse, healthy diets. Web-based development is ongoing to include these RESULTS on the map interface, to be completed by 2026.

CONCLUSIONS

The World Food Map currently is the first systematic catalogue of the most commonly-consumed foods in each country. Furthermore, NUS have been identified for integration into the platform, linked to new food composition data. Future work can enrich sustainability and cultural metadata around each species. Integrating NUS into the World Food Map offers actionable insights to enhance dietary diversity, climate resilience, and cultural heritage, supporting evidence-based policies, research, education, and market strategies.

CONFLICTS OF INTERESTS

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SOAP 41 - GLOBAL HEALTH AND PLANETARY NUTRITION

SOAP41_01

ADHERENCE TO THE PLANETARY HEALTH DIET VS. THE MEDITERRANEAN DIET: CARDIOMETABOLIC IMPLICATIONS IN SPANISH CHILDREN WITH OBESITY

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BACKGROUND AND OBJECTIVES

Addressing the global burden of childhood obesity requires dietary solutions that prioritize both individual health and environmental sustainability. The Planetary Health Diet (PHD) proposes a novel dietary pattern designed to meet individual nutritional needs while minimizing environmental impact, however, its effects on cardiometabolic (CM) health remain broadly unstudied, especially in pediatric populations. In contrast, the Mediterranean Diet (MD) is widely supported for its cardiometabolic benefits. This study aims to evaluate the adherence to the PHD and MD in a cohort of Spanish children with overweight/obesity, and to assess cross-sectional associations with cardiometabolic biomarkers and body composition measures.

METHODS

A total sample of n=612 children with overweight/obesity were studied. Dietary data was derived from at least two 24-h recalls and child-specific indexes of adherence to the MD and the PHD were calculated. CM biomarkers included lipid profile and glycemic status. Body composition was evaluated via Tanita scales. The associations between the adherence to both dietary patterns and the CM health and body composition were studied using multivariable lineal models adjusted for age, sex, Tanner stage, origin, physical activity and sociodemographic status.

RESULTS

Children showed a moderate-to-low adherence to the MD, with a mean score of 6 points out of 11, and a low adherence to the PHD, with a mean score of 41 points out of 140. Statistical analyses did not show significant associations between MD or PHD adherence scores and CM biomarkers. For the PHD, a higher adherence was associated with a significantly higher amount of total lean mass (LM, kg): low adherence PHD: LM 39.6 (38.6-40.5); medium adherence PHD: LM 41.6 (40.7-42.5); high adherence PHD: LM 41.1 (40.1-42.0).

CONCLUSIONS

The overall adherence of a Spanish pediatric cohort to the MD and the PHD is moderate to low. PHD adherence showed a significant cross-sectional association with lean mass. The broader implications of MD and PHD adherence on cardiometabolic health and longer-term health outcomes needs to be further explored in longitudinal cohort studies.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP41_02

THE ASSOCIATION OF PLANT-BASED DIET INDEX WITH DIET QUALITY, ANTHROPOMETRIC MEASUREMENTS, AND BLOOD MARKERS IN ADOLESCENTS

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BACKGROUND AND OBJECTIVES

Plant-based diets have gained significant attention in recent years due to their ability to reduce carbon and water footprints and greenhouse gas emissions. Plant-based foods are classified into healthy and unhealthy categories, and their consumption is used to calculate healthy (hPDI), unhealthy (uPDI), and overall PDI (oPDI) scores. This study aims to investigate the relationship between plant-based diet index scores and adolescents' anthropometric measurements, blood markers, and diet quality.

METHODS

A total of 205 adolescents (59.0% female) were included in the study. Participants completed a food frequency questionnaire that included healthy and unhealthy plant-based foods as well as animal-based foods. Anthropometric measurements, including height, waist circumference, body weight, body fat percentage, lean body mass percentage, and triceps skinfold thickness, were recorded. Participants' dietary habits were also assessed through a questionnaire. The diet quality of adolescents was evaluated using the KIDMED index. Statistical analyses included chi-square tests, One-way ANOVA, and logistic regression.

RESULTS

When PDI scores were divided into tertiles, no significant differences were found in anthropometric measurements and biochemical markers for any PDI score. However, diet quality scores were significantly different between the tertiles of hPDI and uPDI. uPDI was inversely associated with diet quality, with lower odds for medium (OR = 0.89, 95% CI: 0.86–0.94) and high diet quality (OR = 0.78, 95% CI: 0.72–0.85). Conversely, hPDI showed a positive association, with higher odds for medium (OR = 1.05, 95% CI: 1.00–1.10) and high diet quality (OR = 1.15, 95% CI: 1.05–1.25). oPDI was not significant in Model 1 but became significant with adjustments for covariates ($p < 0.001$).

CONCLUSIONS

This study highlights the significant association between plant-based diet indices and diet quality in adolescents. While PDI scores did not show any notable differences in anthropometric and biochemical measures, both hPDI and uPDI tertiles demonstrated significant differences in diet quality. These findings emphasize the importance of considering both healthy and unhealthy plant-based food consumption in promoting overall diet quality. Further research is needed to explore the broader health implications of these diet indices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP41_03

"THOUGHT FOR FOOD": A SYSTEMATIC REVIEW OF HOW PSYCHOLOGICAL FACTORS AFFECT SUSTAINABLE FOOD CHOICES

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BACKGROUND AND OBJECTIVES

Shifting consumers' food choices towards a more sustainable dietary pattern is necessary to transition to a food system that benefits society on an environmental, social and economic level. Given the critical role of consumers in the food system, this review aims to summarize the evidence on consumers' psychological state variables -e.g. attitudes, values, emotions- and their influence on a range of sustainable food outcomes (i.e., food perceptions, attitudes, intentions, purchase and consumption).

METHODS

Three online databases (i.e., Web of Science, PubMed, Scopus) were searched for quantitative and qualitative studies (2014-2024), evaluating this relationship between psychological variables and sustainable food outcomes. After various rounds of screening, we identified 290 articles for full-text analysis.

RESULTS

The majority of studies (*n*=201; 69.3%) focused on organic foods as a primary outcome, while socially and economically sustainable food products (e.g., fair trade, local food etc.) were fairly neglected (*n*=15; 5.0%). The analysis identified several key psychological state categories in relation to sustainable food outcomes. Relevant for intervention communications, we found strong evidence for the positive effect of specific attitudes (e.g., attitude towards meat alternatives) but not for more general pro-environmental attitudes. There was also strong evidence for an association between knowledge and sustainable food outcomes. Given the limited food knowledge among consumers (Palumbo et al., 2019; Skeaff et al., 2017), furthering this knowledge or literacy could foster more sustainable food consumption. Additionally, perceptions and beliefs about plant-based eating need further investigation as findings indicate that some consumers hold beliefs about the healthfulness of plant-based diets that actually discourage their adoption of these foods.

CONCLUSIONS

Certain variables (e.g. attitudes, self-identity, knowledge, etc.) demonstrated strong evidence of association with sustainable food outcomes, highlighting their potential importance for stakeholders aiming to improve sustainable food consumption among the population. However, the current lack of experimental research limits the ability to determine causality, making this an essential area for future investigation.

CONFLICTS OF INTERESTS

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SOAP41_04

ADHERENCE TO THE EAT-LANCET DIET IS ASSOCIATED WITH HIGHER MICRONUTRIENT INTAKE: FINDINGS FROM A CROSS-SECTIONAL STUDY OF COMMUNITY-DWELLING OLDER ADULTS IN GASABO DISTRICT, CITY OF KIGALI, RWANDA

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BACKGROUND AND OBJECTIVES

Dietary patterns around the world have adverse effects on health and the environment, with Sub-Saharan Africa facing a challenge of undernutrition alongside rising rates of non-communicable diseases. Adopting the reference diet proposed by the EAT-Lancet Commission can reduce the environmental burden and improve health outcomes. However, potential impact of this diet on micronutrient adequacy, particularly in older adults in low-income settings, has not been investigated. This study examines adherence to the EAT-Lancet diet and its association with micronutrient intake among older adults in the Gasabo district, Kigali, Rwanda.

METHODS

This cross-sectional study involved 334 older adults aged 55 to 93 years from the Gasabo district. Dietary intake was assessed using two non-consecutive 24-hour recalls, and socio-demographic data were collected through interviews. Adherence to the EAT-Lancet diet was evaluated using a 42-point index based on food group consumption where a higher score indicated better adherence. Micronutrient intake was analysed in relation to adherence tertiles. Multivariable regression models, adjusted for age, sex, and energy intake, were used to assess associations between diet adherence and micronutrient intake.

RESULTS

The EAT-Lancet adherence score ranged from 13 to 36, with a mean of 24.2. Higher adherence was associated with increased consumption of whole grains, vegetables, fish, and nuts, while red meat, dairy, and poultry intake declined. Adherence was positively associated with energy intake and intake of several micronutrients, including retinol-equivalents, thiamine, folate, vitamin B12, and iron. However, the association with riboflavin intake was negligible, and zinc and potassium intake showed no significant association after adjusting for energy intake.

CONCLUSIONS

Higher adherence to the EAT-Lancet diet improves the intake of several micronutrients important for healthy aging in this population of predominantly older, poor adults in Kigali. However, the potential for nutrient gaps, particularly in riboflavin, highlights the need for context-specific dietary adaptations to ensure nutritional adequacy in older populations in Rwanda.

CONFLICTS OF INTERESTS

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SOAP41_05

THE NOVA SCREENER: AN EASY-TO-OPERATE AND LOW-COST TOOL FOR ASSESSING AND MONITORING HEALTHY AND SUSTAINABLE DIETS

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BACKGROUND AND OBJECTIVES

The Nova screener is an easy-to-operate and low-cost instrument designed to assess food consumption according to the degree of food processing. It allows for the generation of two diet quality scores: the Nova score for ultra-processed foods (Nova-UPF) and the Nova score for minimally processed plant-based foods (Nova-WPF). This study aims to evaluate whether the scores generated by the screener can predict adherence to a healthy and sustainable diet measured by a comprehensive method

METHODS

Data were obtained from the NutriNet-Brasil study, an ongoing, fully online multicentric cohort. A subsample (n=812) completed the Nova screener and a 24-hour dietary recall (24h-DR) on the same day, enabling a comparison between the Nova scores and health and sustainable diet indicators (nutrient inadequacy score, adherence to the EAT-Lancet diet and environmental impact indicators) derived from the 24h-DR. Nova-WPF and Nova-UPF scores were calculated based on the reported consumption frequency (yes/no) of 33 WPF items and 23 UPF items, respectively, and categorized into tertiles. The number of nutrients with inadequate consumption were determined using WHO cutoffs for added sugars, saturated fat, trans fat, fiber, sodium, and potassium (range 0-6). Adherence to the EAT-Lancet sustainable diet was assessed using the Planetary Health Diet Index (PHDI, range: 0–150 points). Environmental impact was evaluated through carbon and water footprints. Linear regression models were built and all analyses were adjusted for sex, age, education, and region of the country.

RESULTS

Participants in the highest Nova-WPF tertile ($\geq$9 points) had, on average, higher PHDI scores (+14.4 points), lower inadequacies in the consumption of critical nutrients (-1.12 points), and reduced mean carbon (-0.43 kg CO2eq/1000 kcal) and water footprints (-0.21 L/1000 kcal). Conversely, those with high Nova-UPF scores ($\geq$3) had lower PHDI scores (-4.08 points) and higher inadequate consumption of critical nutrients (+0.72 points), with no significant association observed for environmental footprints.

CONCLUSIONS

The Nova diet quality scores derived from the Nova screener demonstrate significant associations with indicators of healthy and sustainable diets, particularly through the Nova-WPF score. These findings highlight the screener's potential as a tool for monitoring comprehensive dietary quality.

CONFLICTS OF INTERESTS
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SOAP41_06

RISK RANKING OF MYCOTOXINS AND TOXIC METAL ELEMENTS IN PLANT-BASED MEAT AND DAIRY ALTERNATIVES UNDER PROTEIN TRANSITION SCENARIOS

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BACKGROUND AND OBJECTIVES

Food safety risks associated with an increased consumption of plant-based meat (PBMA) and dairy alternatives (PBDA) remain unexplored. Here, we assessed mycotoxins and toxic metal elements exposure and the associated health risks related to the consumption of PBMA and PBDA.

METHODS

We simulated diets by replacing animal-source proteins (i.e. milk and meat) with their plant-based alternatives in the diet of European children, adolescents and adults. A risk ratio method, based on the hazard quotient (HQ), was applied to rank contaminant-related food safety risks. A systematic review was organised to collect and aggregate PBMA and PBDA contamination data in Europe. Occurrence data for toxic metals (e.g. inorganic arsenic (iAs), lead (Pb), cadmium (Cd) and nickel (Ni)) in milk and meat from the European Food Safety Authority (EFSA) were used to allow for a more fair comparison of exposure when substituting animal-source foods with plant-based alternatives.

RESULTS

The highest risks were identified for mycotoxins in PBMA, in particular for the sum of aflatoxins (sum AF), alternariol monomethyl ether (AME), aflatoxin B1 (AFB1) and alternariol (AOH), with HQs for adults of 62.7, 34.6, 12.4 and 2.2 in the lower bound scenario (LB), respectively. In the milk substitution model (LB), HQs exceeding one were calculated for children, with HQs of 4.9 (sum AF) and 1.4 (AFB1), indicating a potential food safety risk. With regards to toxic metals, much lower HQs were found when substituting milk and meat consumption with PBDA and PBMA, however the exposure to most toxic metals would clearly increase. A potential food safety risk, based on the replacement of meat consumption with PBMA, was identified for the nephrotoxic effects of Pb (HQ of 1.0 in LB scenario) in adults. The highest risks for PBDA were identified for iAs (HQ of 0.3 in LB scenario).

CONCLUSIONS

These preliminary outcomes show that the exposure to chemical contaminants, should not be neglected in the transition to more sustainable dietary patterns in Europe.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP41_08

TOWARDS UNDERSTANDING THE BIOCHEMICAL DIVERSITY OF NATIVE AND UNDERUTILIZED PACIFIC ISLAND FOODS

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BACKGROUND AND OBJECTIVES

There are over 11 million people living in small islands scattered across the vast ocean of the Pacific Island Region. The region consists of three island groups: Micronesia, the Melanesia and the Polynesia. The region has a notable increase in population moving from rural to urban areas in the Pacific Islands. Over time such rural to urban drift has led to wide ranging dietary changes from the more traditional or indigenous root crop-based cuisines to a higher reliance on imported food. It is also noteworthy that across most of the Pacific Islands, incidence non-communicable disease is also on the rise and the region has among the highest per capital of diabetes in the world. One of the reasons for high NCDs may be a result of individuals' not consuming sufficiently diverse or nutritious food. The objective of this paper is to present the food compostion research in Pacific Islands over the last 84 years as well as new Global initiatives such as the Periodic Table of the Food Initiative (PTFI) and new food composition data related to native Pacific Island Foods.

METHODS

A review of literaure of Pacific food composition was conducted using desktop analysis. Additionally, over 900 Pacific Island Foods and recipes were analysed as part of an FAO project on Pacific Island Food Composition Tables. Food samples were gathered across Fiji and some Pacific Island Countries and analysed at the Analytical Laboratory at the University of the South Pacific using AOAC and Food Analysis methods. Recently, 35 native and underutilised foods from the Pacific Islands (i.e. Fiji, Solomon Islands, Vanuatu and Samoa) have been collected and analysed for their nutritional value, including fatty acids and mineral content. Fatty acids and mineral content were analysed using AOAC and PTFI platforms.

RESULTS

Food composition initiatives in the Pacific Islands began in the late 1940s and early 1950s by the South Pacific Commission (now Pacific Community) with a focus on commonly consumed Pacific Island Foods. In the 1970s much of the food composition work focused on the issues relating to the rise of non-communicable diseases. Subsequent work has focussed on food composition data, including new data on fatty acids and mineral content in Pacific Island Foods.

CONCLUSIONS

An overview of influential developments and stakeholders within the food composition program of the Pacific Islands as the current and future direction are presented in this talk. Also first data on food composition of select native and underutlised Pacific foods is presented.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP41_09

SCOPING REVIEW OF INTERVENTIONS ADDRESSING FRUIT AND VEGETABLE AVAILABILITY, AFFORDABILITY, ACCESS, OR ACCEPTABILITY

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BACKGROUND AND OBJECTIVES

Globally, fruit and vegetable (FV) consumption falls far below the World Health Organization recommendation of 400 g/person/day, putting millions of people at risk of diet-related diseases. Increasing FV consumption requires simultaneous improvements in the availability, affordability, access to, and acceptance of FV. In addition, it necessitates an approach of inclusion towards socially, economically, or physically marginalized groups. We investigated the state of the literature on fruit and vegetable interventions at all levels of the food system (e.g., production, distribution, marketing, consumption) to understand which have been implemented to improve FV availability, affordability, access, acceptability, and equity, and to what extent interventions have covered multiple areas simultaneously.

METHODS

We searched PubMed, Web of Science, Scopus, CAB abstract, Google Scholar, and several grey literature databases to identify literature with a clear objective of addressing fruit and/or vegetable availability, affordability, access, or acceptability. We restricted dates from 2000 until the date of the search (March 2024). English and French language studies were included, and no restrictions were set on study design or location. After screening by two reviewers, data from included studies were extracted, and studies were assessed for methodological quality and risk of bias. Descriptive analyses were done to identify common themes in FV interventions, populations studied, study locations, and outcomes assessed.

RESULTS

We identified 14,700 articles, 881 of which were ultimately included. Only 16.9% of studies were conducted in low- and middle- income settings (LMICs). Populations were mainly school children (31.8%), general adults (20.5%), infants and young children (12.6%) or adult women (10.1%). The most common intervention type was nutrition education (56.9%), followed by school meals (7.8%) and market information systems (7.4%). Outcomes assessed were mainly fruit and vegetable intake (83%), adoption of healthy practices (29.9%), diet diversity (24.2%), and FV preferences and attitudes (22.3%). About half of the studies assessed a single outcome area (e.g., availability, accessibility, etc.) (49.7%), and only 3% assessed all five areas. Acceptability was the most frequently evaluated (89.1%), and only 10.3% assessed social inclusion.

CONCLUSIONS

Few FV interventions were conducted in LMICs, where there is the highest prevalence of malnutrition and FV underconsumption. More interventions are needed that cut across the spectrum of all areas of the food system and target vulnerable populations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP41_10

ASSESSING THE RELEVANCE OF THE FOOD INSUFFICIENCY INDICATOR IN FRANCE

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BACKGROUND AND OBJECTIVES

In the absence of a legal definition in France, the concept and measure of food insecurity is debated. There is no standardized method for tracking it, and food insecurity is not regularly monitored by public authorities. The current consensus in international literature relies on two approaches to study food insecurity. First, household-centered tools such as the U.S. Household Food Security Survey Module or the reduced Coping Strategy Index (rCSI) consist in several questions which can be aggregated to obtain a synthetic score. Second, food insufficiency is based on a simple question and assesses whether individuals sometimes or often declare that they have not enough to eat. Already used in the French INCA3 survey, this simple and inexpensive approach is suitable for large-scale surveys and could become a practical tool for field workers in identifying vulnerability situations. The aim of this study is to evaluate the relevance of food insufficiency as an approach to food insecurity in France and to assess its comparability with more complex measures. It aims at providing insights to improve the assessment of food insecurity in developed countries.

METHODS

An online survey was conducted among a representative sample of the general population, with questions on dietary status and behaviors, as well as several measures of financial constraints, food insecurity and food insufficiency. The survey was conducted in two waves of about 1,500 individuals. To ensure sufficient statistical power, individuals declaring having not enough to eat were oversampled, adding about 350 individuals. Survey RESULTS were weighted to ensure representativity. Correlations (using Cramer's V) between the food insufficiency indicator and other indicators approaching food insecurity were calculated.

RESULTS

Preliminary findings from the first wave revealed that 14% of the population reported sometimes or often not having enough food. These people were more likely to report being unable to eat meat or fish every other day for financial reasons, restricting their diet, worrying about running out of food or adopting coping strategies identified in the rCSI. A strong correlation (Cramer's $V > 0.3$) was observed between food insufficiency's indicator and these other ones. Further analyses will be conducted to determine whether individuals who self-identified as food insecure by different indicators share similar profiles.

CONCLUSIONS

Despite its simplicity, the food insufficiency indicator is a robust and reliable tool for assessing individuals' food situations. Its simplicity could support its inclusion in regularly conducted surveys and in social workers' assessment of potential beneficiaries' situations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP41_11

‘IT STRENGTHENS FAMILY TIES’: THE ROLE OF COMMUNAL-PLATE EATING AND COMMUNAL-BOWL HAND-RINSING AS RISK FACTORS FOR INFANT DIARRHOEA AND MALNUTRITION

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BACKGROUND AND OBJECTIVES
Diarrhoea, a major cause of death in children under 5, prevalent across sub-Saharan Africa (SSA). Further, across SSA, communal eating from a shared bowl, CB-E, is a cherished practice, often preceded by Communal Bowl Hand Rinsing (CB-HR) with 2 or more washing hands in a shared bowl without soap. CB-HR increases the risk of pathogen transmission by acting as a reservoir. Our systematic review evidenced CB-HR as a risk factor for diarrhoea and other hand-transmitted pathogen outbreaks. No qualitative or intervention studies were found. Through a mixed-METHODSstudy with water, sanitation and hygiene (WASH) experts at 2 key NGOs across SSA and in-depth qualitative research in Mali, we explored the perspectives on pre-meal CB-E and CB-HR (including beliefs and barriers to improved hand hygiene for better infant health outcomes) and its spread across 16 SSA countries.
METHODS

Online survey invitations were sent from WaterAid and Save the Children to all 19 countries with WASH experts. Follow-up semi-structured interviews (SSI) were held with a sample of consenting experts in English, French, or Portuguese. The extent and details of CB-E and CB-HR were summarised. Further, we recorded 59 SSI and 26 focus group discussions (FGDs) across rural and urban Mali with mothers, grandmothers, fathers and elders.

RESULTS
51 experts from 15 countries across SSA responded to the survey. Experts reported CB-E and CB-HR were practiced in all 15 countries, widespread and among various groups and situations including schools and gatherings like funerals or religious events. 20 interviewed experts discussed drivers, including culture (e.g. strengthening family bonds), poor WASH facilities and awareness of health risks. Experts were unaware of targeted interventions by any agency, but stressed the unmet need across SSA. In Mali, FGDs confirmed CB-E and CB-HR were commonplace, rooted in tradition for the purposes of social cohesion and family unity with practices varying slightly in households. There was some awareness of the infection risks. Detailed RESULTS on the systematic review, expert survey interviews and qualitative data from Mali will be presented.
CONCLUSIONS

CB-E and CB-HR are practiced widely across SSA and persist throughout decades of food safety, improvements in WASH facilities and outbreaks or epidemic-related education. Despite knowledge of associated risks, cultural influences mean the practices continue.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP41_12

BENCHMARKING THE NUTRITION-RELATED COMMITMENTS OF FOOD COMPANIES IN SENEGAL

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BACKGROUND AND OBJECTIVES

Unhealthy food environment contributes to the adoption of unhealthy diets, a major risk factor for Non-Communicable Diseases (NCDs). It is recognized that food companies have a crucial role to play in shaping the food environment. The aim of this study was to assess the transparency, comprehensiveness and specificity of food companies' (FCs) policies and commitments towards population nutrition, obesity and prevention of NCDs.

METHODS

The main 37 FCs, including food and non-alcoholic beverage manufacturers [FBMs] (n=25), supermarkets (n=5) and quick service restaurants [QSRs] (n=7) operating in Senegal, were included in the evaluation. FBMs were selected based on their market share, represented by their product portfolio's diversity. Supermarkets and QSRs were identified based on their popularity and the number of stores they own. Policies and commitments were collected through a review of the relevant documentation in the six key domains of the Business Impact Assessment on Obesity and Population-level Nutrition (BIA-Obesity) tool i.e. "Corporate strategy", "Product formulation", "Nutrition labelling", "Product and brand promotion", "Product accessibility" and "Relationship with other organizations". They were then scored by an expert panel according to the criteria of transparency, specificity and comprehensiveness.

RESULTS

Ten out of thirty-seven companies made no commitment to population nutrition. The overall performance of FCs ranged from 0% to 65.4% (median score 14.2%) with FBMs leading (median score: 22.9) and QSRs at the lowest (median score 0). The best performing domain was "Corporate strategy" (median score: 25%), led by FBMs, while the lowest performing domains were "Product promotion", "Product accessibility" and "Nutritional labelling", with median scores of 0%, 4.2% and 5.5%, respectively. Within the supermarket sector, the best performance was in the domain of "Product formulation". Median scores for all domains were zero percent (0%) for QSRs. Foreign companies performed better than local companies, but policies/commitments related to "Product formulation" and "Product accessibility" were scarce for both, in the supermarket sector.

CONCLUSIONS

This study highlights that corporate commitment to population nutrition is relatively low, especially for local companies across key domains of the BIA-Obesity tool. The government must therefore introduce incentive policies for greater transparency in food companies reporting to strengthen accountability for improving population nutrition.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP41_13

DRIVERS OF OVERWEIGHT AND OBESITY AMONG GHANAIAN WOMEN: A MULTIVARIATE DECOMPOSITION ANALYSIS

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BACKGROUND AND OBJECTIVES

Overweight and obesity are increasing globally, with Ghana experiencing a consistent rise. Among Ghanaian women, the prevalence has significantly increased over the past two decades, raising public health and socioeconomic concerns. This study aims to identify and quantify the key drivers of overweight and obesity among women of reproductive age in Ghana, analysing how these factors have contributed to prevalence changes over time.

METHODS

Data from the Ghana Demographic and Health Surveys (GDHS) for 2003, 2008, 2014, and 2022 were utilised. Multiple binary logistic regression models assessed associations between overweight and obesity and various covariates, including age, wealth, and education. A multivariate decomposition analysis quantified the contributions of these factors to the observed trends in overweight and obesity prevalence.

RESULTS

The prevalence of overweight and obesity among Ghanaian women increased significantly, reaching 50% in 2022. Socioeconomic factors, such as wealth and education, alongside urban residence, age, and region, were the most significant drivers. Women in the wealthiest quintile had approximately three times the likelihood of being overweight and over six times the risk of obesity compared to women in the poorest quintile. Decomposition analysis revealed that 22.5% of the increase in overweight and obesity prevalence was attributable to changes in population characteristics.

CONCLUSIONS

The growing prevalence of overweight and obesity among Ghanaian women is not only driven by population characteristics such as wealth and educational status, but primarily the evolving influence of these drivers. These RESULTS suggest that shifts in how drivers like age, marital status, and wealth affect obesity are crucial in understanding the changes in obesity prevalence. This study highlights the complexity of obesity trends and the need for tailored interventions that account for the diverse and evolving factors influencing weight outcomes in Ghana.

CONFLICTS OF INTERESTS

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SOAP41_14

INVESTIGATING LINKAGES BETWEEN SOIL HEALTH, FOOD COMPOSITION AND HUMAN HEALTH

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BACKGROUND AND OBJECTIVES

Globally, but especially in Sub-Saharan Africa, the impact of human practices on soil health, food composition and human health is understudied. The objective of this project is to track nutrients from soils to food to humans from samples obtained in Ethiopia and Ghana, to understand the determinants of food quality and linkages to human and planetary health.

METHODS

A cross-sectional sample of farms (n=120) were purposively selected in Ethiopia (n=60) and Ghana (n=60) to represent diverse regions within the countries and to take into account areas where gold mining is practiced. Soil samples, food samples, human serum and stool samples of farming households and dietary assessment, were collected. Soil, food and serum samples will be analyzed for mineral and hazardous metal content. Soil samples will be analyzed for soil quality parameters and soil microbiome. Food samples will be analyzed for proximates and fatty acid content. Serum samples will be analyzed for complete blood count and inflammatory markers. Stool samples will be analyzed for gut microbiota. Data analysis will include independent group t-tests or Mann-Whitney test. Correlation coefficients with statistical significance will be used to determine the association between soil health parameters and food composition parameters. Chi-square analysis will be used to determine the status of soil health, food composition, and human health. Regression analysis will be conducted to determine the odds/risk of inflammation, heavy metal contamination, and poor nutritional status associated with the quality of food consumed.

RESULTS

Preliminary RESULTS show some variations in soil physicochemical characteristics, between the gold mining and non-mining farms in Ghana. Anaemia prevalence in Ghana is almost twice among the mining households (46%) compared to the non-mining households (28%). In Ethiopia prevalence of anaemia is 16% for women and 24% for men. Anthropometric measurements in study sites of Ethiopia show that 41% of adolescent girls, 34% of men, and 27% of women are underweight (BMI<18.5 kg/m²). Additional RESULTS on soil, food composition and biochemical parameters are forthcoming.

CONCLUSIONS

This study of soil, food composition, dietary intake, human serum and gut microbiome allows a unique and much needed exploration connecting the health of our soil, to the quality of our food, to human health and nutrition outcomes. Aided by advancements in omics techniques, afforded by the Periodic Table of Food Initiative, we can obtain robust assessments of food quality and link these to rich metadata on agricultural practices.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP41_15

COMPARISON OF THE ASSOCIATION BETWEEN THE EAT-LANCET SUSTAINABLE DIET OR THE TRADITIONAL MEDITERRANEAN DIET WITH ALL-CAUSE AND CARDIOVASCULAR MORTALITY IN THE MOLI-SANI STUDY COHORT

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BACKGROUND AND OBJECTIVES

The Planetary Health Diet Index (PHDI) was recently introduced to assess adherence to the EAT-Lancet reference diet, which aims to promote human health while ensuring environmental sustainability. This dietary pattern prioritizes plant-based foods and recommends limiting the consumption of animal-based foods, such as red meat, dairy products, and fish. While the traditional Mediterranean diet (MD) also focuses on plant-based foods, it is not strictly vegetarian, permitting moderate consumption of fish and white meat. Additionally, the MD features olive oil as the main fat source, and includes moderate wine consumption during meals. However, it is unclear whether following a planetary health diet leads to better survival outcomes than adhering to the traditional MD. Therefore, we investigated the association between the PHDI, MD, and all-cause and cardiovascular (CV) mortality in a Mediterranean population.

METHODS

Longitudinal analyses were run on 22,893 men and women (mean age 55.4±11.7 years) recruited in the Moli-sani Study, established in Italy in 2005-2010. Food intake was assessed at baseline through a 188-item food frequency questionnaire. The PHDI was calculated as described by Bui et al., which addresses some limitations of previous scores by evaluating 15 food groups, resulting in an index that can range from 0 to 140. The Mediterranean Diet Score (MDS; range 0-9) was used to assess adherence to the MD.

RESULTS

The mean values of the PHDI and the MDS were 79.4 (SD=80.0) and 4.4 (SD=1.6), respectively, with a weak correlation between the two indices (Spearman correlation coefficient = 0.26). Over a median follow-up of 13.1 years, a total of 2,565 deaths were recorded, including 909 from CV diseases. Multivariable-adjusted hazard ratios (HRs) for total mortality associated with the PHDI or MDS were 0.93 (95% CI 0.82-1.06 for Q5 vs. Q1) and 0.79 (95% CI 0.69-0.91 for Q5 vs. Q1), respectively. For CV mortality, HRs were 1.09 (95% CI 0.88-1.36 for Q5 vs. Q1) for the PHDI and 0.79 (95% CI 0.63-1.00 for Q5 vs. Q1) for the MDS.

CONCLUSIONS

In this large Mediterranean cohort, adherence to the traditional MD was associated with significantly lower all-cause and CV mortality rates, whereas adherence to a planetary health diet was not. These RESULTS, if validated by future longitudinal studies, would question, at public health level, the effectiveness of promoting a planetary health diet over the traditional MD, especially in Mediterranean populations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 48 - GLOBAL HEALTH AND PLANETARY NUTRITION

SOAP48_01

KNOWLEDGE, ATTITUDE, AND PRACTICE ON SUSTAINABLE DIET AMONG NUTRITION AND DIETETIC STUDENTS AND PROFESSIONALS: A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES

Nutrition and climate challenges are increasingly interconnected, highlighting the urgent need for a transition to more sustainable dietary patterns. Nutritionists and dietitians are the key health professionals who promote changes in individuals and society's dietary habits and consumption behaviors. This review aimed to examine the knowledge, attitudes, and practices of sustainable diets among nutrition and dietetic students and professionals.

METHODS
A systematic search was performed in two databases (Ovid and PubMed) from inception to November 2024. The included studies were articles in English, studies assessing knowledge, attitude, and practice about sustainable diet, studies involving nutrition and dietetic students or professionals, and studies other than review and commentary articles. Two authors screened the articles independently, and the narrative summary was presented to synthesize RESULTS. Mixed METHODSAppraisal Tool was used to evaluate the quality of included studies.
RESULTS
Out of 3,214 articles, eight studies met the inclusion criteria, with a total of 3,757 participants ranging from nutrition and dietetic students, dietitians, and other health science students and professionals. The studies were conducted in Spain (n=3), Canada (n=2), Australia, the United Kingdom, and Europe. Study designs included cross-sectional (n=4), qualitative (n=2), and mixed-METHODS(n=2) with various survey instruments. Overall, participants had moderate to high knowledge and a multidimensional understanding of sustainable diets. There was also a positive attitude regarding sustainable diet, such as confidence in defining sustainable dietary patterns and expression of interest in having related training. However, practice incorporating sustainable diet principles was relatively low, with a small proportion of dietitians moderately practicing (38%) and receiving training on a sustainable diet (25%). Although a sustainable food system has been introduced in education curricula, there is a need to improve the module comprehensively and strengthen literacy through continuous professional development. Some studies identified barriers related to implementation of a sustainable diet, such as structural and behavioral factors, lack of education, inadequate regulation, and differing ideological views.
CONCLUSIONS

While most participants recognize the environmental impact of diet and express a strong interest in sustainable diet, the practical application remains limited. Educational program improvement and professional development are crucial to bridging these gaps. Further research is warranted to expand the investigation, particularly in Asian and African contexts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP48_02

INCIDENCE AND PERSISTENCE OF MODERATE ACUTE MALNUTRITION (MAM) IN A LONGITUDINAL COHORT OF REFUGEE CHILDREN: WHICH CHILDREN ARE AT HIGHEST RISK AND IN NEED OF ACTIVE MANAGEMENT?

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BACKGROUND AND OBJECTIVES

Screening and intervention approaches for MAM are unclear, but increasingly, Mid-Upper-Arm-Circumference (MUAC) alone is used. A large longitudinal case series from refugee camps in Cox's Bazaar, Bangladesh, identifying MAM using both MUAC and Weight-For-Height-Z scores (WHZ) provides the opportunity to examine how each performed, the relation to growth and survival, and which children might benefit from active management.

METHODS

Monthly MUAC, weight and height routinely collected to age 24m were retrieved on all children born between 2012-2017, as well as information on mortality. Children with any WHZ and or MUAC in MAM range (MUAC 115-125cm; WHZ -2 to -3) between age 6-24m were defined as Screen Positive (spMAM) and treated with counselling and food supplements. Mean MUAC, WHZ, Weight-For-Age-Z scores (WAZ) and Height-For-Age-Z scores (HAZ) were calculated for 3-monthly age bands. Children who had one measurement reaching spMAM but a 3-monthly average above the MAM range were defined as transient.

RESULTS

Of the 4131 eligible, 1587 (38%) children had spMAM; 40.3% were first diagnosed using MUAC, 41.3% with WHZ and 18.5% with BOTH; 42% were transient and only 1.3 % progressed to severe malnutrition (MUAC < 115cm or WHZ < -3). Transience was most common for those identified by WHZ only (68%) compared to MUAC only 25%, BOTH 21%. There was more prior decline in WAZ (suggesting acute malnutrition) in WHZ (mean [SD] -0.59 [0.4]) and BOTH (-0.61 [0.5]) compared to MUAC only (-0.25 [0.5] $p<0.001$), while a WAZ increase was seen in 14.4% with low MUAC, but only 1.1% WHZ. At screen severe stunting (HAZ <-3SD) was already commoner in low MUAC (22%) compared to WHZ 9.3% or BOTH 8.9% ($p<0.001$). At 24m severe stunting was present in 40% of MUAC, 22% WHZ and 28% BOTH, compared to 12% of non-MAM. Transient cases showed the least mean decline in HAZ to age 24m (-0.47; persisting MUAC -0.55, WHZ -0.66, BOTH -0.61; $p<0.001$). Of 44 deaths after age 6m, 21 occurred in MAM children. Only children with BOTH were more likely to die than never MAM (relative risk = 3.2 95% CI 1.5 -6.8).

CONCLUSIONS

Screening via MUAC identified more stunting, but tended to miss acute malnutrition. WHZ identified more acute short term weight loss. These data suggest that recent WHO recommendations permitting MUAC only screening and restricting therapeutic foods to children with persistent or relapsing MAM (1) would greatly reduce the number of children actively treated, but the safety of this approach needs to be formally tested.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP48_03

POLICY COHERENCE FOR HEALTHY DIETS: A MULTI-COUNTRY ANALYSIS

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BACKGROUND AND OBJECTIVES

Good nutrition depends critically on the adoption of healthy diets by all. This goal, however, is influenced not only by sector-specific health and nutrition policies, but also by policies in other sectors (e.g., agriculture, trade) that shape food systems. Improving diet quality thus requires for policies across sectors to be aligned as opposed to working against one another. This is the essence of food systems policy coherence (FSPC): The alignment of policies that affect the food system with the aim of achieving health, environmental, social, and economic goals, to ensure that policies designed to improve one food system outcome do not undermine others. However, while FSPC is an appealing concept, its assessment in practice is not straightforward, and there has been limited analysis of how policy coherence manifests for promoting healthy diets, specifically. We thus sought to analyse how policies across sectors contribute to or detract from achieving the goal of healthy diets for all.

METHODS

We developed and applied a new diagnostic tool that allows users to identify areas of coherence/non-coherence among food system policies and suggest ways to improve coherence. This tool identifies potential ways in which policies in each of six areas (health, agriculture, environment, social, industrial/economic, trade) could affect 10 food systems outcomes, including the goal of healthy diets for all, and translates these into multiple-choice questions. The tool is implemented using an approach combining document review of food-related policies and key-informant interviews with local policy experts. We applied it in 9 low- and middle-income countries in Africa and Asia.

RESULTS

We identified concrete ways in which policies in all six sectors could positively or negatively affect the goal of healthy diets. For example, agricultural research or extension services may be incoherent with healthy diets by favouring staples, oilseeds, or sugar crops to the detriment of more nutrient-dense foods, or be coherent with them by providing support for biofortification. RESULTS from the 9 countries suggest that, in general, health and social policies tend to be highly coherent with nutrition goals, whereas policies related to trade, environment, and agriculture are less so. However, there are opportunities for improvement in all sectors. RESULTS were also highly varied, suggesting that there are lessons to be learned across countries in terms of formulating coherent nutrition-related policies.

CONCLUSIONS

The new tool allows diagnosing area of coherence and non-coherence in terms of how policies support the adoption of healthy diets, highlighting area for future intervention.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP48_05

UNHEALTHY FOOD CONSUMPTION IS NOT ASSOCIATED WITH WEIGHT-FOR-LENGTH Z SCORE AMONG JORDANIAN CHILDREN 6-23 MONTHS

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BACKGROUND AND OBJECTIVES

The dietary quality of Jordanian children 6-23 months has deteriorated over the last three decades. Foods high in fat, sodium, and calories, but low in micronutrients have been linked to excessive weight gain. We investigate the relationship between unhealthy food consumption (UFC) and weight-for-length z-score (WLZ) among Jordanian children 6-23 months.

METHODS

We analyzed secondary data from the 2023 Jordan Population and Family Health survey (N=1,241). Data were cleaned and analyzed in STATA 18.5. The outcome was WLZ (2006 WHO). The key exposure was UFC (WHO/UNICEF 2021 IYCF indicator). A binary indicator for UFC was used to denote whether a child consumed candies, fried carbohydrates, or sweet pastries. The number of these food groups a child consumed was represented by a continuous UFC score (0-3). Covariates were child's sex, governorate, wealth quintile, and mother's education. We conducted bivariate tests of association for the outcome and covariates using Pearson's correlation, pairwise mean comparisons, and Student's t-test. We used a multivariate ordinary least squares (OLS) model to assess the relationship between UFC and WLZ. Sensitivity analyses involved interaction terms (ufc*governorate/wealth quintile, governorate*wealth quintile/mother's education) and examining marginal differences between subcategories of all covariates. All statistical analyses were adjusted for survey design and sample weights.

RESULTS

The mean WLZ was 0.71 and median 0.69. Seven percent of children were classified as overweight (WLZ>2) and 65% of all children consumed at least one UFC. UFC (binary or continuous) was not statistically significantly associated with WLZ. All else equal, on average, WLZ varied significantly by geographic location with children living in northern Jordan (governorate of Jerash) exhibiting higher WLZ than those in central Jordan (governorate of Amman) (β=0.318, 95% CI=0.061-0.619, p=0.039). Compared to children whose mother had none to 5 years of education, children whose mother completed 6 years of education had higher WLZ (β=0.725, 95% CI=0.086-1.36, p=0.026).

CONCLUSIONS

UFC was not but geographic location, maternal education, and household wealth were associated with WLZ among Jordanian children 6-23 months in 2023. Future research should look at other METHODSof defining unhealthy food, such as using the updated NOVA ultra-processed food index, and consider including sugar-sweetened beverages into the definition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP48_06

HEALTHY PUBLIC FOOD PROCUREMENT IS POSSIBLE! AN IMPACT EVALUATION OF ULTRA-PROCESSED FOOD RESTRICTIONS IN A LARGE NATIONAL SCHOOL PROGRAM

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BACKGROUND AND OBJECTIVES

In 2020, Brazil's School Feeding Program (PNAE) innovated by mandating that no more than 20% of national funds be spent on processed and ultra-processed foods (P&UPF). An analysis of procurement data from all Brazilian municipalities examined the policy's immediate impact on such expenditures.

METHODS

This study utilizes national food procurement data from all 5,570 municipalities in Brazil, covering the periods before (2015–2019) and after (2021–2022) the implementation of restrictions on purchasing P&UPF. A difference-in-differences model was applied to assess whether these restrictions led to significant reductions in P&UPF procurement. Given the nationwide implementation of the restrictions, municipalities were identified as controls if their P&UPF procurement expenditures had consistently remained below the policy threshold (20% of the national transfers for PNAE food procurement) before 2020—that is, municipalities that already complied with the restrictions. These control municipalities were then compared with municipalities whose P&UPF procurement expenditure levels had exceeded the 20% threshold in the years leading up to the policy enactment. We then checked for regional heterogeneity and whether further adjustment for municipality per capita gross domestic product (GDP), number of students served in each school system, percentage of schools with kitchen and cafeteria, and the percentage of transfers that municipalities used to procure foods directly from family farmers.

RESULTS

Municipalities with prior P&UPF procurement expenditure levels exceeding the 20% threshold exhibited a 10.9 percentage point greater reduction in the proportion of federal transfers allocated for P&UPF procurement. After adjusting for potential confounders, this reduction increased to 12.0 percentage points. On average, 80% of the total P&UPF expenditure was allocated specifically to UPF. Similar RESULTS emerged when examining expenditures solely for UPF. Notably, substantial regional heterogeneity was observed, with significant reductions across all Brazilian macro-regions except for the South.

CONCLUSIONS

Our findings indicate that implementing restrictions on P&UPF procurement for school meals is feasible, effectively reduces Brazilian students' exposure to UPF, and serves as an innovative model for operationalizing healthy food procurement policies on a national scale.

CONFLICTS OF INTERESTS

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SOAP48_07

FACTORS ASSOCIATED WITH MICRONUTRIENT-RICH FOOD, BREASTMILK SUBSTITUTE, AND UNHEALTHY FOOD CONSUMPTIONS AMONG JORDANIAN CHILDREN 6-23 MONTHS

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BACKGROUND AND OBJECTIVES

Complementary feeding practices in Jordan have worsened in the last three decades. The prevalence of consuming micronutrient-rich food groups (MNRF) has declined over time. We investigate the factors associated with MNRF, breastmilk substitutes (BMS), and unhealthy food consumption (UFC) among Jordanian children 6-23 months.

METHODS

We analyzed secondary data from the 2023 Jordan Population and Family Health survey (N=2,061). Data were cleaned and analyzed in STATA 18.5. We assessed whether children consumed each of the following food groups: dark green leafy vegetables (DGLV), Vitamin-A rich fruits and vegetables (VAFV), eggs, legumes or nuts (L/N), meat (fish/poultry/organ meat), animal-source foods (ASF), yogurt or cheese, animal milk, formula or animal milk, candies, fried carbohydrates, and sweet pastries. We also assessed UFC, which was defined as the consumption of candies, fried carbohydrates, or sweet pastries. Covariates included governorate, wealth quintile, mother's education, child's age, and child's age squared. We used a multivariate logistic regression model to assess the relationship between food group consumption and covariates. All statistical analyses were adjusted for survey design and sample weight.

RESULTS

Only 20% of children consumed a plant-based MNRF (DGLV, VAFV, L/N), 40% of children consumed an animal-source MNRF (eggs, meat, yogurt/cheese), while 50% consumed a UFC. As children age, the odds of being introduced to MNRF and UFC increase (OR>1 and $p<0.05$ in all models). Higher maternal education attainment was associated with higher odds of consuming candies and fried carbohydrates (OR>2 and $p<0.05$ in all models). Higher wealth status was associated with higher odds of consuming DGLV, eggs, and formula or animal milk (OR>1 and $p<0.05$ in all models).

Differences in consumption of MNRF existed by geographic location. Compared to central Jordan (governorate of Amman), children living in southern Jordan (governorate of Aqaba) had around 60% lower odds of consuming DGLV (OR=0.36, 95% CI=0.14, 0.93) and VAFV (OR=0.43, 95% CI=0.19, 0.93); children living in northwest Jordan (governorate of Mafraq) had 40% lower odds of consuming meat (OR=0.54, 95% CI=0.32, 0.90).

CONCLUSIONS

Consumption of MNRF differs by geographic location, maternal education, and child's age. Nutrition interventions should focus on increasing the consumption of plant-based MNRF.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP48_09

MULTIDISCIPLINARY APPROACHES INCORPORATING "MOTTAINAI" AND JAPANESE CULINARY TRADITION CONCEPTS, FOOD LITERACY AND ART TO PROMOTE PLANETARY HEALTH IN FAMILIES OF SCHOOL-AGED CHILDREN: A PRE- AND POST-INTERVENTION STUDY

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BACKGROUND AND OBJECTIVES

Tackling food waste and unhealthy food choices requires a multidisciplinary approach. We piloted an adult workshop (1) combining concepts of mindful eating, food literacy, diet sustainability, Japanese culture, culinary traditions and the principle of "Mottainai (What a Waste!)"; Mottainai is rooted in ethical and religious principles which call for more sustainable lifestyles (2, 3). We aimed to 1) adapt the workshop to families with school-aged children and incorporate art to facilitate engagement, and 2) evaluate its effectiveness.

METHODS

The study design was a pre-post evaluation of an intervention (2x2h participatory workshops) with children and parents. Workshop 1 consisted of 1) Food consciousness and Mottainai talk with "Eating using the 5 senses" activity; 2) Talk on food choices and production systems; 3) Plate painting based on Charles Rennie Mackintosh and Willow Patterns. Workshop 2 consisted of 1) Eating for Health and the Environment, talk with activity to plan a meal considering food miles and CO2 production, 2) Traditional Japanese cuisine and home cooking, and the importance of eating slowly and food presentation. 3) Sushi making and eating nutrient-rich foods. The impact of the workshops was evaluated using pre-post questionnaires and 5-point Likert items that assessed changes in intention to practice different principles of Mottainai and sustainable food practices. Sociodemographic data and qualitative feedback were also collected.

RESULTS

A total of 15 parent-child dyads attended both workshops. Following the workshops, children's knowledge of food production systems and food waste increased from 7 (IQR 4-8) to 9 (IQR 9-10) (maximum possible score 10, $p<0.001$), and they indicated an increased willingness to engage with food mindfulness, e.g. chewing slowly (increase from 3, IQR 3-4 to 4, IQR 4-5, $p=0.003$) and appreciating special/traditional foods (pre-median score 4, IQR 3-5, post-median 4, IQR 4-5, $p=0.026$). Additionally, the parents who attended reported a greater intention to consider human and planetary health in their food choices (pre-median score 38, IQR 33-40, post-median score 41, IQR 38-42, $p=0.007$), such as engaging with aspects of Mottainai, food consciousness and sustainability.

CONCLUSIONS

Multidisciplinary participatory workshops can effectively engage participants with Mottainai and food consciousness concepts and promote planetary health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP48_10

DIETARY PATTERNS IN TRANSITIONING RURAL AND URBAN AREAS

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BACKGROUND AND OBJECTIVES

Like other Sub-Saharan Africa (SSA) countries, Tanzania is undergoing socio-economic changes that impact lifestyles and dietary choices. Traditionally, differences in dietary habits between rural and urban areas in Tanzania and other SSA countries were prominent. However, recent research indicates converging lifestyles and dietary choices associated with increased risk of cardiometabolic diseases. The objective of the current study was hence to investigate differences and similarities in dietary patterns, energy, and food groups intake in urban and rural Tanzania

METHODS

Dietary habits were assessed by use of a Food Frequency Questionnaire (FFQ) for 442 respondents aged 44-65 years in urban (Ubungo -Dar es Salaam) and rural (Kilindi- Tanga) districts of Tanzania. Dietary patterns were determined using Principal Components Analysis (PCA). Bivariate analyses identified determinants of dietary patterns in urban and rural Tanzania.

RESULTS

Two dietary patterns, a “mixed pattern” characterized by whole grains, potatoes, fruits, vegetables, meat, fried potatoes and tubers, alcohol, sugar-sweetened beverages (SSB), sugar and sweets, and added oils and a “plant-rich pattern” characterized by whole grains, fruits, pulses and peas, seasoning vegetables and salads, SSB, sugar and sweets, and added oils were identified. Urban residents contributed more to the mixed pattern, while rural residents had a higher contribution to the plant-rich pattern. Overall, dietary diversity was greater in urban than rural Tanzania. The estimated median daily energy intake was 2,902 kcal (IQR: 1449.2) with a lower energy intake in rural (2,817 kcal, IQR: 1,274) as compared to urban residents (3,052 kcal, IQR: 1558) (p=0.021). The percent contribution to the median average daily energy intake for grains, fruits, and milk was higher in rural than urban participants. No differences were observed for meat, poultry and eggs.

CONCLUSIONS

We identified two distinct dietary patterns: a “mixed pattern” prominent in urban and a “plant-rich pattern” more common in rural. Urban diets were more diverse with slightly higher energy intake. These findings underscore the effects of urbanization on diets and the need for targeted nutritional intervention for both rural and urban populations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP48_13

CHARACTERIZATION, DETERMINANTS, AND HEALTHINESS OF DIETARY PATTERNS OF ADOLESCENTS ALONG THE RURAL-URBAN CONTINUUM IN VIETNAM

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BACKGROUND AND OBJECTIVES

Urbanization is driving changes in food environments and dietary patterns, especially in low- and middle-income countries. Understanding determinants of dietary patterns can inform food systems transformation and support consumers in achieving sustainable, healthy diets. Adolescence is a crucial period for establishing healthy food consumption habits. This study aims to characterize dietary patterns and their drivers in Vietnamese adolescents.

METHODS

As part of the CGIAR initiative Sustainable Healthy Diets Through Food System Transformation (SHiFT), we conducted a quantitative 24-hour recall involving adolescents aged 11-19 years in low- to middle-income areas (one small-town, peri-urban, urban) of North Vietnam (n=2861; 15% second recall). We identified dietary patterns using Latent Class Analysis, which creates mutually exclusive groups of consumers with similar dietary patterns. We explored determinants and healthiness of diets among adolescents mapped to these different patterns. Determinants were age, sex, area, food insecurity, and wealth status. Healthiness of diets was assessed as Global Diet Quality Score (GDQS)—healthy and unhealthy, higher scores is higher diet quality—and mean probability of adequacy (MPA).

RESULTS

The five dietary patterns identified were consumed by 26%, 24%, 20%, 15%, and 15% of adolescents, respectively. Pattern 5 was the least healthy, in terms of MPA (0.2 out of 1) and GDQS-Healthy (5 out of 32). Energy intake in this group was low, at 1750 kcal/day, with the main food groups consumed being rice and poultry. Individuals in this pattern were mostly living in the small town, food insecure, and belonged to the lowest wealth tertile households. Pattern 4 was the healthiest (MPA: 0.4; GDQS-Healthy: 11; GDQS-Unhealthy: 12 out of 17). Energy intake was higher (2004 kcal/day,) and adolescents in this group had higher intakes of fish, eggs, and liquid oil. They were more likely to reside in urban areas and from highest wealth tertile households. Other patterns had average intakes of all foods (Pattern 1), high consumption of meat and bread (Pattern 2) or consumption of unhealthy foods and mostly comprising girls (Pattern 3).

CONCLUSIONS

The least healthy dietary pattern was consumed mostly by small-town adolescents from low wealth and food insecure households, with low consumption of both healthy and unhealthy foods. They may be most at risk of undernutrition, and efforts to increase healthy food consumption are needed. For adolescent girls in Pattern 3, education and behavior change programs are necessary to shift their diets away from unhealthy foods.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP48_15

UNDERSTANDING THE DRIVERS OF FOOD CHOICE IN ETHIOPIA: A LITERATURE REVIEW

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BACKGROUND AND OBJECTIVES

Food choice is shaped by a complex interplay of sociocultural, economic, and environmental factors. In Ethiopia, a lower-middle-income country, traditional and cultural practices have long influenced dietary patterns. However, rapid urbanization and lifestyle changes are shifting eating habits, leading to greater consumption of processed foods. This literature review provides a comprehensive synthesis of the research on the drivers of food choice in Ethiopia.

METHODS

Literature searches were performed in the Web of Science and Scopus electronic databases, and Google Scholar was used to find additional publications not listed in these databases. During data extraction, the reference lists of the selected literature were reviewed to identify any studies potentially missed in the electronic searches. Data were categorized and analysed based on two main elements: (i) individual-based motives and (ii) dimensions of the food environment. A total of 23 studies conducted between 2018 and 2023 were synthesized, covering diverse population groups such as children, adolescents, pregnant and lactating women, adults, and households. The studies cover urban, rural, and peri-urban settings, offering insights into region-specific and population-specific drivers of food choice

RESULTS

A total of 41 individual-level motives were identified and categorized into seven clusters: 1) health and nutrition perceptions, 2) psychological factors, 3) sociocultural influences, 4) sensory appeal, 5) social interactions, 6) socio-demographic factors, and 7) ethical concerns. Our review found key regional differences in food choice determinants, with affordability, availability, and accessibility being the most studied dimensions. Urban areas showed a stronger focus on health and nutrition, while rural areas emphasized socio-demographic factors. Peri-urban areas, however, were significantly understudied. Population analysis highlighted that accessibility and promotional efforts were frequently studied motives of food choice among young children and adolescents, while motives of pregnant and lactating women were more into availability and health benefits. Notably, adolescents received the least research attention, indicating a gap in the literature

CONCLUSIONS

Our review highlights regional differences in food choice determinants, with urban areas focusing on health, rural areas on socio-demographic factors, and peri-urban areas understudied. The lack of research on adolescents and in peri-urban areas highlights the need for further study to inform targeted interventions for improving diet quality in Ethiopia.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 03 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP03_01

EFFICACY OF A FAMILY-BASED WHATSAPP INTERVENTION IN PROMOTING ADEQUATE GROWTH IN AMAZONIAN CHILDREN

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BACKGROUND AND OBJECTIVES

The Brazilian Amazon faces a dual burden of malnutrition, with stunting and micronutrient deficiencies persisting alongside rising rates of overweight and obesity in children. Despite the promise of digital interventions to address malnutrition, their application in this region remains limited. This study evaluated the efficacy of a family-based WhatsApp intervention in promoting adequate growth among school-aged children.

METHODS

A randomized controlled trial was conducted with 266 parents or caregivers of children aged 7–8 years from a birth cohort. Participants were recruited via phone and social media in June 2023. The intervention group received persuasive multimedia messages via WhatsApp for 19 weeks, while the waitlist control group received usual care. Anthropometric measurements, including weight, height, and waist circumference (WC), were collected at baseline and post-intervention. Dietary intake and biochemical markers were also assessed, with data analyses ongoing. Statistical evaluations followed an intent-to-treat approach using paired/unpaired t-tests, Mann-Whitney U, and Wilcoxon Signed Rank tests (Stata 18.0; significance level $P<0.05$).

RESULTS

Baseline characteristics were balanced between groups. Post-intervention analysis revealed significant increases in weight, height, and height-for-age z-scores for boys and girls in both groups ($p<0.05$). The difference among boys' post-intervention was significant ($p<0.05$), with boys in the intervention group showing an increase in BMI-for-age z-scores, while those in the control group experienced a decrease.

CONCLUSIONS

This intervention highlights the potential of digital health strategies to address malnutrition in vulnerable populations. The increase of BMI-for-age z-scores among boys in the intervention group suggest a positive influence on growth patterns. These findings demonstrate the intervention's promise as a scalable solution for improving child health in underserved regions.

CONFLICTS OF INTERESTS
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SOAP03_02

ENHANCING CHILD NUTRITION IN TIMOR LESTE: FEASIBILITY STUDY FINDINGS ON KEY FACTORS AND OPPORTUNITIES TO IMPROVE DIET QUALITY FOR CHILDREN 6-23 MONTHS

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BACKGROUND AND OBJECTIVES

Child under-nutrition remains a critical public health issue in Timor-Leste. Despite efforts in food and nutrition interventions, inadequate complementary feeding practices contribute significantly to poor nutrition in early childhood, with 47% children <5 years stunted. This study explores caregivers' complementary feeding practices, identifying key drivers and opportunities to improve child feeding in Timor-Leste.

METHODS

We conducted in-depth interviews; with mothers (n=38), fathers (n=16), and grandparents (n=15) of children aged 6-23 months, and key informants (n=14) including health workers, village chiefs and NGO workers. Interviews were conducted in four purposively selected districts, identified based on suboptimal complementary feeding indicators and recommendations from UNICEF. Locally recruited, trained data collectors conducted the interviews. Respondents were purposively selected based on child age and socioeconomic status, with fathers and grandmothers. Interviews were translated into English and reviewed for quality assurance. We used deductive and inductive approaches and thematically analysed the data.

RESULTS

Health providers were the most trusted sources of information on complementary feeding, though family members, particularly grandmothers, also played an important role in providing guidance. Complementary feeding practices were influenced by cultural and practical factors, with porridge commonly introduced at six months, followed by vegetables, fruits, and occasionally animal-source foods. Barriers to optimal feeding practices included economic constraints, poor nutrition knowledge, and challenges in accessing diverse, nutritious foods. Opportunities for improving child nutrition include addressing household income poverty, access to nutrition counselling and support, promoting locally available nutritious foods, strengthening local food production, and fostering community engagement through health workers, NGOs, and mothers' support groups.

CONCLUSIONS

Improving children's dietary practices in Timor-Leste requires a comprehensive approach that combines culturally appropriate interpersonal counselling, increased access to nutritious foods, and support from trusted sources (health providers/family members). Collaboration between health workers, NGOs, community groups, and local leaders is essential to overcome financial barriers and enhance the nutritional status of children. This situational analysis will guide government programming to improve the diet of children 6-23 months.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP03_05

WOMEN'S EXPERIENCES IN THE FOOD ENVIRONMENT AND ITS PERCEIVED EFFECT ON THEIR FRUIT AND VEGETABLE INTAKE: INSIGHTS FROM NORTHERN TANZANIA

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BACKGROUND AND OBJECTIVES

There is limited information about the linkages between consumer behaviours for healthy diets and related food environment drivers in low-income and rural contexts. We examined how women living in rural Tanzania experience the food environment by assessing their buying patterns, perceptions, and accessibility, for fruit and vegetables (F&V), and the association of these factors with women's reported F&V intake.

METHODS

We used cross-sectional data for 2597 women living in 33 villages across five districts in Arusha and Kilimanjaro regions in Tanzania. Self-reported buying patterns and perceptions included F&V buying frequency, sources, year-round availability, and convenience. Accessibility was assessed using geospatial analysis as distance and time between home and F&V selling centres. We administered a 30-day recall non-quantitative food frequency questionnaire to assess F&V intake. We conducted a descriptive analysis of women's experience indicators and tested their association with an F&V intake score using multivariate linear and two-part regression models controlling for covariates (women: education, occupation, marital status; household: size, wealth, food insecurity).

RESULTS

The mean age (SD) for women was 38.2 (6.2) years. 81% and 89% of women reported buying fruits and vegetables for home consumption respectively. Relative to fruit, more women reported buying vegetables daily (F:5%; V:35%). Fruits were perceived as slightly more available year-round (F:65%; V:60%) but less convenient to buy (F:65%; V:80%) and distance (km) and time (mins) to fruit sources were greater compared to vegetable sources (median distance (SD)- F: 4.7 (6.1); V: 1.5 (4.9); median time (SD)- F: 20 (46.5); V: 16(43)). 24% and 94% of women reported daily intake of F&V respectively. Lower intake of F&V was associated with buying weekly compared to daily (adjusted mean difference or average marginal effects (95% CI), F:-0.92 (-1.36, -0.47, $p<0.01$); V: -0.47 (-0.85, -0.09, $p<0.05$)), and the perception that F&V were sometimes versus mostly available (F: -0.31 (-0.44, -0.18 $p<0.01$); V: -0.61 (-1.1, -0.13, $p<0.05$)). Longer distance (> median) was negatively associated with vegetable intake but not fruit intake (V:-0.54 (-0.93, -0.16, $p<0.01$). Time was not associated with the intake of F&V.

CONCLUSIONS

Buying frequency, year-round availability and distance to the source were associated with women's reported F&V intake in northern Tanzania. These findings indicate that increasing availability and accessibility in the food environment may improve the intake of fresh foods.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP03_06

ASSOCIATION BETWEEN NUTRITIONAL STATUS, DIARRHOEA INFECTIONS AND FEEDING PRACTICES IN CHILDREN AGED 6-59 MONTHS IN URBAN AREAS IN CAMEROON

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BACKGROUND AND OBJECTIVES

Childhood malnutrition and diarrhoea with their severity are closely linked to poor feeding practices. Most children under 59 months have had at least one diarrhoea infection. Knowledge of good nutritional practices appropriate to children's age and environment is key to preventing these childhood diseases. This study aimed to evaluate the association between nutritional status, diarrhoea infections and feeding habits in children aged 6-59 months in urban areas in Cameroon.

METHODS

A cross-sectional study was carried out in three Health Districts. A total of 217 mother-child pairs were included. A structured questionnaire was used to collect data on socio-demographic factors and feeding practices. Anthropometric measurements were taken according to the standardised method of the World Health Organization (WHO). Z-scores were used to assess nutritional indices. A sub-sample of 50 children with diarrhoea was used to assess biochemical and microbiological parameters, including stool cultures Logistic regression was used to investigate the determinants of malnutrition and diarrhoea infections.

RESULTS

The prevalence of stunting, underweight, and diarrhoea were 23.96% (18.28-29.64), 15.66% (10.82-20.49) and 23.04% (17.04-28.59) respectively. The highest proportion of diarrhoea (13%) was observed among children aged 6-11 months whose mothers started diversifying their diet early. Microbiological analysis revealed that 23% of diarrhoea was caused by yeasts (18.3%), followed by *Entamoeba histolytica* (2.7%). Among the mothers, the age group that reported a significantly higher prevalence of undernutrition was 18-24 years [odds ratio (95% CI): 0.464 (0.233-0.915), P <0.027]. The person who frequently feeds the child (neighbours, community members) was the factor associated with the high prevalence of diarrhoea [odds ratio (95% CI): 0.285 (0.126-0.626), P <0.01].

CONCLUSIONS

The RESULTS suggest that there is a need for a community-based intervention that focuses more on good hygiene practices in infant and young child feeding for community members responsible for the feeding and nutrition of the child in the absence of the parents.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP03_09

SUGAR AND SWEETENER CONSUMPTION AMONG ADULTS AND 11-18 YEAR OLD YOUNGS IN HUNGARY

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BACKGROUND AND OBJECTIVES

The TET Platform conducted representative surveys in 2022 and 2024 on adults' sugar and sweetener consumption habits and attitudes towards sweetness. A survey of 11-18 year olds was carried out in 2017 and will be repeated in 2025 in collaboration with the Department of Family Medicine at Semmelweis University.

Aim: The aim of the research was to find out the taste preferences of Hungarian adults and young people aged 11-18 years, and to investigate which products they prefer sweet tastes. The aim was also to investigate attitudes towards and knowledge of sugar, alternative sugars, intense sweeteners.

METHODS

Adults were surveyed by a self-administered questionnaire in 2022 and repeated in 2024. An online panel survey of 1,000 consumers was conducted. The sample is representative of the national population aged 18+ by age, gender, region and municipality type. Statistical analysis was performed using SPSS 25.0. Three types of research have been or are being carried out in the context of the survey of 11-18 year olds: 1. prospective diet diary-based research, 2. questionnaire-based survey, 3. anthropometric studies.

RESULTS

The survey of adults found that more than 60% of respondents prefer sweet flavours and that the preference for sweet flavours is mainly related to gender and age. The sweet tooth of older people stands out among the age groups. Health consciousness also seems to have an important influence. The survey of 11-18 year olds showed that the average energy from carbohydrates (52 E%) was close to the lower limit of 55 energy percent of the recommendation, but within this, energy from added sugars exceeded the maximum recommended 10 energy percent (12%). By nutrient profile analysis, the primary sources of intake of added sugars were also monitored, with sugar and honey being the first (41% of intake), followed by sugared soft drinks and fruit juices with 10% or less fruit content (14%), fruit products with added sugar (9%), milk and milk products (6%) and cereal products with added sugar (6%).

CONCLUSIONS

Family doctors and health professionals have a major role to play in education, including the reduction of anomalies in sugar and sweetener consumption habits.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP03_10

Beyond ingredients, METHODSand dinners: feasibility of expanding the role of recipes in child feeding

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BACKGROUND AND OBJECTIVES

Parents need supports to achieve healthy food provision for young children. Despite the proliferation of recipes, minimal evidence exists regarding their use and role. Recipes typically target food provision and main meals, but have potential to influence other aspects of the home food environment impacting child food intakes, such as parental feeding practices and between-meal snacks, through their design and embedded messaging. This research aimed to explore parents' views of such tailored recipes.

METHODS

Recipes for families with young children were designed in various formats, such as ideas for basic combinations of 2-3 foods/ingredients, "5 ways with" various fruits and vegetables, and a focus on snacks. Messaging to promote healthy home food environments was embedded within recipes as "Feeding Kids Tips", for example, promoting modelling and family meals. These were incorporated in an app intervention supporting parents managing toddler fussy eating. Australian parents of 1- to 3-year-old children were recruited via Facebook, given 2-6 weeks' access to the app, and invited to participate in semi-structured interviews about their recipe use, preferences and views on the app recipes and "Feeding Kids Tips". A Pragmatic Approach to thematic analysis was applied.

RESULTS

Most of the 27 parents interviewed already used recipes regularly, but more commonly for main meals than snacks. Parents had variable interest in recipes for snacks, with some feeling they didn't need snack recipes, at least while their child was young, or that snacks were "whatever you can grab". Despite this, the basic combinations of 2-3 foods/ingredients and "5 ways with [vegetable/fruit]" were generally viewed positively by parents, which they suggested labelling as "quick/easy snack ideas". Most parents viewed the "Feeding Kids Tips" favourably, considering them "good reminders" and "a really good idea combining information in one spot". Though whether and how parents thought they would use the information was variable.

CONCLUSIONS

Recipes likely offer untapped opportunities within health promotion. In supporting parents with practical ideas of nutritious snacks, presenting "quick/easy snack ideas" may appeal to parents more than "recipes". Embedding messages about healthy home food environments within recipes for families shows feasibility, and future research should test efficacy.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP03_12

VEGETARIAN DIET AND LIKELIHOOD OF BECOMING CENTENARIANS: A PROSPECTIVE STUDY

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BACKGROUND AND OBJECTIVES

Inverse associations between vegetarian diet and health-realted outcomes have been observed among middle-aged and older adults (≥60 years); however, the role of vegetarian diet on exceptional longevity, especially in adults aged ≥80 years, remained unexplored.

METHODS

Included in this prospective nested case-control study were 6,181 participants aged 80+ years from the Chinese Longitudinal Healthy Longevity Survey (CLHLS), a nationally representative cohort established in 1998. The participants were classified as omnivores and vegetarians according to the dietary intake data collected by a simplified food frequency questionnaire. The primary outcome was living to 100 years old by 2018 (the end of follow-up). Multivariable conditional logistic regression models were used to evaluate the associations between vegetarian dietary patterns and the likelihood of becoming centenarians, and adjusted odds ratios (ORs) and 95% confidence intervals (CIs) were estimated. Subgroup analysis stratified by the body mass index (BMI) of participants was further conducted.

RESULTS

A total of 1,721 centenarians (cases) were identified and 4,460 non-centenarians who deceased before reaching 100 years (controls) were matched them with by age, sex, and year of entry. Compared with omnivores (n=5,007), vegetarians (n=1,174) had a lower likelihood of becoming centenarians, with an OR (95%CI) of 0.81 (0.69-0.95). Similar patterns were observed across vegetarian subgroups: pesco-vegetarians (OR: 0.78, 95%CI: 0.61-0.99), ovo-lacto-vegetarians (OR: 0.91, 95%CI: 0.72-1.14), and vegans (OR: 0.73, 95%CI: 0.54-0.98). The observed association was stronger in underweight individuals (BMI <18.5 kg/m2, *P*- interaction = 0.039), with an OR (95%CI) of 0.73 (0.58-0.91) for vegetarian diet and becoming centenarians, but no significant association was detected in those with BMI ≥18.5 kg/m2 (OR: 0.92, 95%CI: 0.74-1.15).

CONCLUSIONS

Among individuals aged 80 years and older, we observed that adherence to vegetarian diet was associated with lower likelihood of becoming centenarians. Our findings underscored the importance of maintaining a balanced diet with a suitable mix of animal- and plant-derived foods for exceptional longevity, particularly in the underweight oldest-old.

CONFLICTS OF INTERESTS

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SOAP03_13

THE IMPACT OF HIGH-QUALITY DIETARY PATTERNS ON THE PREVENTION OF CHRONIC LIVER DISEASES: A META-ANALYSIS OF OBSERVATIONAL STUDIES

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BACKGROUND AND OBJECTIVES

While conventional research primarily focuses on the impact of individual nutrients or specific foods on chronic liver diseases, the cumulative influence of various dietary patterns on the risk of these diseases remains underexplored. The objective of this study was to assess the most current evidence on the relationship between dietary patterns and chronic liver disease risk through a meta-analysis of observational studies.

METHODS

A systematic literature search was conducted using PubMed and Web of Science databases up to November 2024 to identify studies on the effects of five widely recommended dietary patterns—AHEI, HEI, AMED, DASH, and HPDI—on chronic liver diseases. We applied predefined inclusion and exclusion criteria to screen, quality-assess, and extract data from the studies.

RESULTS

A total of 44 articles encompassing included 32 cross-sectional studies, 56 cohort studies, and 11 case-control studies involving over 65,000 participants were included in the analysis. A random effects model was used to evaluate the associations between dietary patterns and chronic liver disease outcomes. The analysis revealed significant negative associations between the following dietary patterns and chronic liver diseases: AMED (OR=0.64, 95% CI: 0.54–0.75), AHEI (OR=0.69, 95% CI: 0.59–0.87), DASH (OR=0.80, 95% CI: 0.74–0.86), HEI (OR=0.68, 95% CI: 0.61–0.76), and HPDI (OR=0.75, 95% CI: 0.71–0.78). Subgroup analysis showed that AMED had a significant protective effect against chronic liver disease in North America (OR=0.65, 95% CI: 0.51–0.84) and Europe (OR=0.54, 95% CI: 0.44–0.66). AHEI showed a significant association in the case-control studies (OR=0.34, 95% CI: 0.13–0.89).

CONCLUSIONS

The findings suggest that adherence to healthy dietary patterns may reduce the risk of developing chronic liver diseases. These RESULTS underscore the potential of dietary modifications in liver disease prevention and management.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP03_15

THE ROLE OF FOOD BUSINESS OPERATORS IN EFFECTIVELY MONITORING AND REPORTING ADVERSE REACTIONS TO (NOVEL) FOOD PRODUCTS

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BACKGROUND AND OBJECTIVES
The global food system is under pressure from population growth, urbanization, and shifting consumer preferences. Novel plant-based proteins are emerging as potential solutions, but could also lead to a rise in food allergies due to changes in protein intake. Even though novel food authorisations require allergenicity assessment, current METHODSare inadequate, and communication pathways between risk regulators, risk assessors and the food industry as well as consumers about potential (development of) allergenicity seem undefined. Hence, we study the role of food business operators (FBOs) in effectively monitoring and reporting adverse reactions to (novel) food products. These findings will feed into the development of a Post-Market Monitoring (PMM) system to monitor and analyse the adverse reactions.
METHODS

Firstly, a variety of FBOs was invited to complete an online questionnaire to assess their current reporting processes, communication methods, and handling of allergy-related adverse events. Based on their questionnaire responses, selected FBOs participated in (online) interviews for gaining deeper insights into their reporting systems, challenges they encounter, and communication strategies within their supply chain. To conclude, a focus group with FBOs was held to actively discuss the interview findings and explore improvements and preferences regarding the - to be developed - PMM system.

RESULTS
Preliminary RESULTS show that FBOs face several challenges in monitoring adverse reactions to (novel) foods, particularly regarding food allergies. Amongst others, distinguishing between a food allergic reaction, intolerance or poisoning seems challenging. Most FBOs had established consumer care lines to receive complaints, but systematic procedures for analyzing and reporting the events were inconsistent. Small and medium-sized manufacturers often relied on manual tracking systems, while larger manufacturers integrated automated databases to categorize and prioritize reports. The FBOs recognize the importance of monitoring and reporting adverse reactions to novel foods.
CONCLUSIONS

Current approaches to dealing with suspected reported allergies are fragmented and lack consistency. A harmonized PMM system is essential to address these challenges. This system should provide standardized reporting templates, clear guidelines on managing allergy-related events, and structured pathways for data exchange among stakeholders in- and outside the supply chain. This underscores the need for collaborative efforts across the food chain to ensure the safe introduction and acceptance of novel foods.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 06 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP06_01

CREATIVE LOCAL SOLUTIONS: INNOVATIVE ALTERNATIVE PRODUCTS FOR PREVENTION AND TREATMENT OF MALNUTRITION IN LOW-RESOURCE SETTINGS IN AFRICA

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BACKGROUND AND OBJECTIVES

Globally, more than 3.1 billion people were unable to afford a healthy diet in 2021, with at least 735 million people facing hunger in 2022. During the same period, 2.4 billion people globally were food insecure (FAO et al., 2023). In Kenya, malnutrition of all forms has continued to be a concern among women, children, and other vulnerable groups, particularly in urban slums and arid and semi-arid regions. Approximately 18% of children under age five years of age are stunted, 5% are wasted, 3% are overweight, while 10% are underweight (KDHS, 2022). All these are pointers to the health burden caused by food and nutrition insecurity, unhealthy diets, and lifestyle changes.

The ongoing nutrition and gender equality project called REACTS-IN funded by Global Affairs Canada, is working closely with the county government and Jomo Kenyatta University of Agriculture and Technology (JKUAT) to develop local nutrition products called PAMSAD and PAMSAD+ for prevention and treatment of malnutrition among children 6 months to 5 years of age in a sustainable manner.

METHODS

Local and biofortified crops promoted by the project such Orange Fleshed Sweet Potato, High Iron Beans, pearl millet, ground nut, and omena (fish) were used to develop the products. Two recipes were made through proportionate blending of the flours to give optimal nutrient density and acceptability (PAMSAD). An enriched sample was also made by adding omena flour (PAMSAD+). Laboratory testing for macronutrients, vitamins, and minerals was done at JKUAT food fortification laboratory.

RESULTS

The two flour blends PAMSAD and PAMSAD+ provided the recommended daily calorie and protein amount for catch-up growth. Case 1. Blend of pearl millet(50%)+ groundnut flour (20%)+ sweet potato (15%)+ bean flour (15%) PAMSAD, Kcal=827 and Proteine =26gm Case 2. Blend of 50% pearl millet, 15% ground nut flour, Sweet potato flour, 15% bean flour, 20% omena: PAMSAD+ Kcal=810, and Protein =41gm. The recipes recommended were supposed to be close to the PD/HEARTH recommendation.

CONCLUSIONS

Sensory analysis of the samples revealed that the omena blend (PAMSAD+) was rated low in aroma, taste and general acceptability than PAMSAD. PAMSAD will be promoted by care group volunteers targeting 25,000 children between the age of 6 months to 5 years in Elegeyo Marakawit county.

CONFLICTS OF INTERESTS

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SOAP06_02

EFFECT OF MEAT CONSUMPTION ON COPD: A SYSTEMATIC REVIEW AND META-ANALYSIS

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BACKGROUND AND OBJECTIVES

Chronic obstructive pulmonary disease (COPD) is a global public health issue and a major cause of morbidity and mortality in both developed and developing countries. Meat consumption is considered one of the factors influencing the risk of COPD. The current studies have not conducted a comprehensive analysis that includes various types of meat consumption such as fish, cured meat, red meat, processed meat, and unprocessed meat. There is a need for systematic and comprehensive research to clarify the relationship between meat consumption and the risk of COPD. The aim of the study is to conduct a comprehensive systematic review and meta-analysis to summarize the existing data on the association between meat consumption and the risk of COPD.

METHODS

This meta-analysis searched the literature published in PubMed and Web of Science before October 2024 on the effects of meat on COPD, and included a total of 15 articles through manual selection, quality assessment, and data extraction of search RESULTS strictly following inclusion and exclusion criteria.

RESULTS

The RESULTS showed that the odds ratio (OR) for total meat consumption and the risk of COPD was 1.15 (95% confidence interval (CI): 1.01 to 1.31; $p < 0.001$), indicating that total meat consumption is associated with an increased risk of COPD. Our analysis revealed that fish consumption (OR: 0.84; 95% CI: 0.72–0.97) and unprocessed meat consumption (OR: 0.93; 95% CI: 0.81–1.07) had protective effects on COPD risk. However, processed meat consumption (OR: 1.18; 95% CI: 1.02–1.37) and cured meat consumption (OR: 1.64; 95% CI: 1.41–1.90) was significantly associated with an increased risk of COPD. In addition, subgroup analysis of the effects of gender and country on the risk of COPD illustrated that meat consumption increased the risk of COPD in all individuals (OR: 1.23; 95% CI: 0.91–1.67) and was more significant in Asian (OR: 1.30; 95% CI: 0.87–1.97) and American countries(OR: 1.24; 95% CI: 0.87–1.78).

CONCLUSIONS

Our study comprehensively investigated the relationship between meat consumption and COPD risk and found that meat consumption was associated with an increased risk of COPD.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP06_03

ASSOCIATIONS BETWEEN MATERNAL NUTRITIONAL STATUS AND BREASTMILK COMPOSITION

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BACKGROUND AND OBJECTIVES

Maternal nutrition influences infant health by affecting breastmilk (BM) composition. In Bangladeshi slums, high child malnutrition rates suggest a link between maternal nutritional status and BM quality. This study examined the association between maternal nutritional status and BM macronutrient and micronutrient composition in a Bangladeshi slum.

METHODS

A descriptive study was conducted over six months among lactating mothers of infants under six months. Participants were grouped by body mass index (BMI): 34 normal-weight (BMI $\geq$ 18.5 kg/m^2) and 23 underweight (BMI < 18.5 kg/m^2). BM samples were analyzed for energy, macronutrients, total fat, major fatty acids, amino acids, human milk oligosaccharides (HMOs), and micronutrients. Linear regression models adjusted for maternal age, dietary diversity, and lactation period. Statistical significance was set at $p < 0.05$.

RESULTS

BM from underweight mothers had significantly lower levels of carnitine (β: -1.49, 95% CI: -2.51, -0.49), vitamin B3 (β: -329.6, 95% CI: -601.14, -58.16), vitamin B7 (β: -2.7, 95% CI: -4.79, -0.61), and iodine (β: -5.36, 95% CI: -9.46, -1.25) compared to normal-weight mothers. Other macro and micronutrients (energy, carbohydrate, protein, fat, vitamins A, E, and other B vitamins, minerals) were lower in underweight than normal-weight mothers' BM, these differences were not statistically significant. No significant differences were found for major fatty acids or HMO groups between two groups of mothers.

CONCLUSIONS

Maternal undernutrition is associated with poorer BM macronutrient and micronutrient composition. Addressing maternal malnutrition in urban slums is critical to improving BM quality and supporting infant growth and development.

CONFLICTS OF INTERESTS

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SOAP06_04

THE EFFECTS OF DAILY CONSUMPTION OF RUMINANT MILK ON DIGESTIVE COMFORT IN OLDER WOMEN

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BACKGROUND AND OBJECTIVES

Digestive discomfort can deter bovine milk consumption and has led to increasing interest in ovine and caprine milks due to perceived digestive and nutritional benefits. However, studies examining their effects on gastrointestinal comfort in the older population are limited. The main objective of the YUMMI study was to investigate how consumption of bovine, ovine or caprine milk affects digestive comfort in older women.

METHODS

In this 12-week multi-arm, parallel, multi-centre, single blinded randomised controlled trial, healthy women (n = 165; 68.1 ± 5.4 y) with low habitual milk intake were randomised to one of four intervention groups: habitual diet supplemented with 500 mL of either bovine, caprine, or ovine milk daily; or a habitual diet with no additional milk (control). Digestive comfort (reflux, abdominal pain, indigestion, diarrhoea, constipation) was assessed via the Gastrointestinal Symptom Rating Scale (GSRS), administered weekly, and a daily bowel habit diary for number of complete spontaneous bowel movements (CBSM) and stool form using the Bristol Stool Form Scale (BSFS).

RESULTS

Mean (SD) changes in GSRS abdominal pain scores from baseline to week 12 (primary outcome) were -0.03 (0.65), -0.05 (0.49), 0.02 (0.47), and 0.02 (0.35) for the caprine, ovine, bovine and control groups, respectively. Similar mean changes at week 12 were observed for all GSRS domains, and for CBSM and BSFS scores, with no significant differences between the groups (all p values > 0.05). However, some early differences were observed between groups. From baseline to week one, mean abdominal pain scores increased more in the caprine group than control group, by 0.2 points (95% CI 0.0, 0.4). At week two, mean constipation scores increased more in the caprine group (by 0.3 points (95% CI 0.0, 0.6)), and in the ovine group (by 0.4 points (95% CI 0.1, 0.7)) compared to control. A greater increase in mean indigestion scores was observed in the caprine group, by 0.3 points (95% CI 0.0, 0.6). From baseline to week two and three, mean BSFS scores significantly decreased in the ovine group compared to the control group, by -0.5 points (95% CI -0.8, -0.2) and -0.4 points (95% CI -0.8, -0.1), respectively. No significant differences were observed after the second and third weeks.

CONCLUSIONS

The inclusion of two cups of bovine, caprine and ovine milk is well tolerated by older women after an initial acclimatisation period. These findings could inform dietary recommendations and interventions for this growing population group.

CONFLICTS OF INTERESTS

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SOAP06_05

CONSUMPTION OF ULTRA-PROCESSED FOODS AND PREVALENCE OF DYSLIPIDEMIA: THE FILIPINO WOMEN'S DIET AND HEALTH STUDY

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BACKGROUND AND OBJECTIVES

Ultra-processed food (UPF) consumption has been linked to an increased cardiovascular disease (CVD), but evidence regarding their association with dyslipidemias remains scarce in Southeast Asian populations. The aim of the study was to examine the cross-sectional associations of consumption of UPF with the prevalence of dyslipidemias in Filipino immigrant women in Korea.

METHODS

A total of 581 Filipino women married to Koreans in the Filipino Women's Diet and Health Study (FiLWHEL) were included in the study. UPF was identified from NOVA classification of food using 24-hours recalls. Blood samples were collected from participants who fasted at least eight hours before blood collection. The primary outcomes of this study were circulating levels of serum fasting lipid profiles: triglycerides, high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and total cholesterol (TC). Impaired blood lipid profiles were defined as hypercholesterolemia (≥ 200mg/dL), Hypertriglyceridemia (≥ 150mg/dL), high LDL-C (≥ 130mg/dL), or low HDL-C (< 40mg/dL). The odds ratios (ORs) and 95% confidence intervals (CIs) were calcuated using logistic regression. Least square means (LS-means) and 95% CIs were calculated using generalized linear models (GLM).

RESULTS

Mean ± SD of UPF consumption (% energy) was 29.05 ± 18.72. Although the association was not statistically significant, UPF consumption and the prevalence of dyslipidemia showed a suggestive association across tertiles; ORs (95% CIs) for subsequent tertiles compared to the first tertiles were 1.21 (0.75-1.95), and 1.44 (0.76-2.76), respectively. In the subgroup analysis, individuals younger than the median age of 35 years with high UPF consumption had a potentially higher prevalence of dyslipidemia; ORs (95% CIs) were 2.82 (1.19-6.68), and 3.24 (1.10-9.57) for subsequent tertiles, compared to the 1st tertile (p for trend = 0.05). No significant associations were observed in individuals older than 35 years (p for trend = 0.91, p for interaction = 0.14) or in the body mass index (BMI) strata (p for interaction = 0.28). In GLM analysis, UPF consumption showed possible association with LDL-C (p for trend = 0.08) but was not significantly associated with other lipid profiles.

CONCLUSIONS

High UPF consumption was associated with a suggestively higher prevalence of dyslipidemia among individuals under 35 years old and showed a potential link to elevated LDL-C levels. No significant associations were observed for other lipid profiles or in BMI-stratified analyses.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP06_06

FOOD INTAKES AS PREDICTORS OF THE DEVELOPMENT OF OBESITY AMONG 5- TO 9-YEAR-OLD SOUTH AFRICAN CHILDREN: A COHORT STUDY

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BACKGROUND AND OBJECTIVES

Obesity is a public health problem among children in low-income countries. The aim of this study was to investigate factors linked to the development of obesity over four years in a cohort of South African children, aged 5-9y at baseline.

METHODS

In 2017, 1202 healthy children were recruited from Potchefstroom, South Africa to track early health related changes over 4 years. Parents completed sociodemographic and validated food group questionnaires on household income and their children's selection from healthy and unhealthy food groups. Weight and height of the children were measured, and WHO BMI z-score (BAZ) was calculated. Physical activity (PA) was determined by accelerometry in a subgroup of children. Measurements were repeated in 2021-2022 in 672 participants, when children returned to school full-time after the COVID-19 pandemic. Changes in frequency of food selection, PA and BAZ from baseline to end were assessed. Longitudinal associations between frequency of food selection, PA and BAZ from baseline and end, and the association with age and household income with 4-year change in BAZ were determined by mixed models.

RESULTS

Weekly intakes from the fast food group, sedentary time and BAZ increased significantly, whereas weekly intakes of sugar-sweetened beverages (SSBs), as well as moderate and vigorous PA (MVPA) decreased from baseline to end. At baseline and end household income was positively associated with BAZ. Despite a decrease in frequency of SSBs intake for the total group, daily intake of SSBs (7 times/week) versus no SSB intake was associated with an increase in BAZ ($p=0.04$). On the contrary, regular tea intake was associated with a decrease in BAZ. Having vegetables daily vs. never was also associated with a BAZ reduction ($p= 0.03$). After adjustment for age, sex and household income there were trends of similar associations between SSBs intake and BAZ, and vegetable intakes and BAZ (both $p=0.07$). Daily intake of milk vs. no milk ($p=0.01$), and unexpectedly, daily biscuits vs. none ($p=0.02$) were associated with a decrease in BAZ. In the subsample with PA data an increase in MVPA predicted a decrease in BAZ ($p<0.001$).

CONCLUSIONS

The prevalence of obesity increased markedly among young school-age children over four years, following the COVID-19 lockdown period. Strategies to increase vegetable and milk intakes, and to increase physical activity among primary school age children to prevent adiposity gains should be prioritised.

CONFLICTS OF INTERESTS

Salome Kruger is a member of the Research Grants Review Panel of the South African Sugar Association. The other authors declare no conflict of interest in relation to this work.

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SOAP06_07

A PILOT PRODUCE PRESCRIPTION PROGRAM TO PROMOTE FOOD ACCESS AND FOOD LITERACY

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BACKGROUND AND OBJECTIVES

Household food insecurity remains a public health challenge in Canada. Produce prescription (PRx) programs have emerged as a strength-based intervention that leverages healthcare settings to improve food security and diet-related health outcomes. While the potential benefits of PRx interventions are becoming established in Canada, program utilization and integration within healthcare settings remain a challenge. Unison Health and Community Services (Unison), a non-profit organization, developed a pilot PRx program serving adults in two locations within Northwest Toronto, Canada. To improve program delivery, reach, and impact, we aimed to assess program implementation and utilization and their impact on food access, food literacy, and health outcomes.

METHODS

Unison's primary care team will refer individuals meeting the inclusion criteria (living on low income, experiencing challenges to food security, and having at least one chronic disease risk factor) to participate in the PRx program. Free access to fresh fruits and vegetables over 16 weeks, nutrition education, and personalized follow-up care will be provided. A pre-and-post-intervention survey will be used to evaluate the program. Semi-structured focus groups and key informant interviews with staff and program participants will be conducted in person and online over MS Teams. Interview transcripts will be analyzed thematically using a hybrid inductive-deductive approach. The Consolidated Framework for Implementation Research will guide an analysis of barriers and facilitators to program implementation.

RESULTS

This is an ongoing initiative, and the intervention is expected to be completed by March 2025. Data analysis will unfold throughout the coming months, with RESULTS expected in the spring of 2025.

CONCLUSIONS

PRx programs hold promise as an innovative approach for responding to participants' food-health-related needs and preferences. Findings will provide insights into program benefits and inform decisions on scaling the initiative across Unison’s five operating sites. As food prescribing models gain traction in Canada and globally, it will be critical for program planners and implementers to consider diverse food preferences and health needs of participants to improve program uptake and impact.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP06_08

THE BOLSILLO SALUDABLE PILOT LESSONS AND SCALING TOWARDS A NATIONAL PROGRAM FOR CHILE

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BACKGROUND AND OBJECTIVES

We will share lessons learned from designing and piloting a new smartphone app-based healthy incentive benefit program, Bolsillo Saludable, for low-income families to use on fruits and vegetables in ferias (open markets) and implications for scaling the program nationally.

METHODS

In formative work, we took a community-based approach by observation and informational interviews with key stakeholders (feria trade associations, feria vendors, feria users and non-users) in 3 geographic regions of Chile. Additionally, we used past social support programs and other auxiliary data to estimate benefit amounts, eligibility, cycle and allowed use, as well as programmatic cost implications to the government if scaled nationally. Importantly, we engaged various ministries (Social Development, Health, Finance, Agriculture) and a benefit distribution software company by sharing proposed program design components and options. Finally, in June-Aug 2024, we ran an 8-week feasibility pilot and conducted surveys (pre-post) and focus groups discussions among 30 participants (3) and 8 vendors in 1 feria (1).

RESULTS

Based on the formative work, families from the 40% most socially vulnerable segments of the country received an electronic monthly transfer of 16,000 CLP (approximately 17 USD) for each eligible household member, including children under 18 years old, students under 25 years old, and individuals with disabilities. While the feasibility pilot was not powered, the surveys showed increases in quantities of fruits and vegetables purchased and increases of likelihood of consuming various fruits and vegetables. In focus groups, beneficiaries reported substituting unhealthy snacks with fruit, the importance of limiting the benefit use to only healthy items and their willingness to navigate some of the limitations of the programs such as the limited availability of vendors. Vendors reported increases in their sales and social capital by more interactions with customers but a few reported concerns about cash-flow given the electronic payments and tax payments. Several beneficiaries and vendors noted some technical difficulties initially that were resolved within a week or two.

CONCLUSIONS

the pilot showed high acceptability of the program among beneficiaries and feria vendors. However, for successful scaling-up, it is essential to engage more feria vendors in the program. This could involve lowering or exempting the current 19% tax on goods and services for items purchased under the program.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP06_09

COOKING AROUND THE WORLD: DIFFERENCES IN COOKING FREQUENCY BY GENDER AND FOOD SYSTEM TYPOLOGY ACROSS 135 COUNTRIES FROM 2018-2022

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BACKGROUND AND OBJECTIVES

Cooking meals at home is often recommended as a strategy to consume a healthy diet and avoid ultra-processed foods and unhealthy dietary patterns. Evidence suggests that in some contexts cooking at home is associated with healthier diets. However, domestic cooking has traditionally been a highly gendered activity, and as food environments, economies, and social norms evolve globally, understanding of cooking behaviors in different contexts is needed particularly in light of changes to cooking and eating behaviors that occurred during the disruption caused by the COVID-19 pandemic.

METHODS

We analyzed repeated cross-sectional data from 135 countries with data from the 2018-2022 waves of the Gallup World Poll (n=638,192). Frequency of cooking lunch and dinner over the past seven days was assessed at the individual level. Frequency of eating home cooked lunch and dinner (regardless of who cooked the meal) over the last seven days was also measured. Using the Food Systems Dashboard, we classified countries into one of five food system typologies: 1) rural and traditional; 2) informal and expanding; 3) emerging and diversifying; 4) modernizing and formalizing; and 5) industrial and consolidated. We then used unadjusted and adjusted negative binomial regression models to examine trends in the associations between food system typology and frequency of cooking and eating meals at home from 2018-2022 overall and stratified by gender.

RESULTS

Across most food system typologies, mean number of days cooking, but not eating meals at home gradually increased between 2018 to 2019, peaking in 2020 (among females) and 2021 (among males) and then declined in 2022, trending towards pre-pandemic levels. Adjusted for covariates, participants from emerging and diversifying food systems cooked meals at home 13% (95% CI: 1·10, 1·16, P<0·001) more compared to participants in rural and traditional food systems. In all food system typologies and in all years females cooked more frequently than males. Overall, compared to males, females cooked meals at home 214% more frequently (P<0·001).

CONCLUSIONS

From 2018-2022, across the globe, females cook more than males and during the COVID-19 pandemic gender-based disparities in frequency of cooking meals at home were exacerbated. Cooking behaviors and norms should be considered for policy and public health efforts to improve diet quality and nutrition at the global, national, and local levels.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP06_10

FOOD INSECURITY AND DIET IN FRANCE: A POST-INFLATION PERSPECTIVE

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BACKGROUND AND OBJECTIVES

The recent “Gilet Jaunes” protests and the Covid-19 pandemic have highlighted the issue of food insecurity in France, showing that it remains a significant social and public health concern. Previous studies have shown that food-insecure individuals in France tend to have lower diet quality and consumed smaller amounts of fruits and vegetables. However, these studies were conducted before the recent increase in food prices. The aim of this study was to assess the prevalence of food insecurity in a more recent context and compare the dietary habits of food-insecure and food-secure individuals.

METHODS

A survey combining a dietary behavior questionnaire and a 24-hour dietary recall was conducted online among a representative sample of the general population. To ensure sufficient statistical power, individuals declaring having not enough to eat (food insufficiency) were oversampled. Two waves (summer and autumn) were conducted to account for seasonality with about 1500 (main sample) plus 350 (oversample) individuals recruited for each wave. Survey RESULTS were weighted to ensure representativity. Analyses focus on dietary patterns, food types consumed, and compliance with French nutritional recommendations.

RESULTS

Preliminary findings from the first survey wave revealed that 14% of the population reported sometimes or often not having enough food. While the average number of daily meals was similar between individuals with and without food insufficiency (3.66 vs. 3.67, difference not significant), the distribution of these meals varied. Food insufficient individuals were less likely to eat at breakfast or dinner, but more likely to eat after dinner. They also consumed fewer fruits and vegetables (consumed as such, excluding those in recipes) and showed differences in the types of fruits consumed. Additionally, the consumption of organic products was less frequent among food-insufficient individuals, though such products were not entirely absent from their diets.

CONCLUSIONS

These findings highlight that food insufficiency is not negligible in the general French population. Beyond issues of quantity, qualitative aspects of dietary intake—such as food types and nutritional diversity—emerge as critical concerns in terms of compliance with nutritional recommendations. Further analyses incorporating data from both survey waves and adjusted regression models will provide a more comprehensive understanding of these findings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP06_12

DIFFERENCES IN CHILD DIET QUALITY AND WEIGHT STATUS AT 2-5 YEARS BY DURATION OF U.S. SOCIAL SAFETY NET PROGRAM PARTICIPATION AND MEDIATION BY INFANT DIET QUALITY

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BACKGROUND AND OBJECTIVES

For U.S. children in low-income households, social safety net programs like the Women, Infants, and Children (WIC), the Supplemental Nutrition Assistance Program (SNAP), and Medicaid (public health insurance) provide essential benefits in reducing disparities and improving health outcomes. The duration of participation in these programs has been shown to have a differential impact on health outcomes. The Infant Diet Quality Index (IDQI), measures nutrition during the first year of life and predicts later diet quality and weight status.

Objective: To assess whether differences in child diet quality and weight status from 2 to 5 years by duration of program participation are mediated by IDQI scores.

METHODS

This study analyzed data from the U.S. WIC Infant-Toddler Feeding Practices Study-2 to investigate how the duration of participation ("always," "sporadic," or "none") in WIC, SNAP, and Medicaid was associated with body mass index z-scores (BMIz), Healthy Eating Index (HEI-2020) scores, and HEI-2020 subscales – adequacy (food groups and nutrients to consume adequate amounts of) and moderation (food groups and nutrients to limit) – at ages 2-5 years. Using multivariable regression and causal mediation methods, IDQI scores were tested as a mediator of these associations.

RESULTS

Medicaid participation duration was not associated with HEI-2020 outcomes or BMIz. Those with any SNAP participation had lower HEI scores compared to those never on SNAP and the differences by duration of participation were mediated by IDQI, which explained up to 23%, 30%, and 20% of the differences in HEI-2020, HEI-2020 adequacy, and HEI-2020 moderation scores, respectively, between those always on SNAP and those never on SNAP. In contrast, participants who consistently enrolled in WIC had higher HEI scores than those who never or sporadically on WIC. This association was mediated by IDQI, which explained up to 8%, 12%, and 4% of the differences in HEI-2020, adequacy, and moderation scores, respectively. The IDQI mediated the associations between SNAP at 4 years and BMIz and WIC at 2 years and BMIz.

CONCLUSIONS

This study demonstrates the importance of understanding the association between the duration of social safety net program participation and child diet quality and weight outcomes and that infant diet quality practices may mediate these associations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP06_13

EXPLORING THE SIGNIFICANCE OF POLYPHENOL-BASED INTERVENTIONS IN TREATING DEPRESSION AND ANXIETY: A DOSE RESPONSE META- ANALYSIS AND SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

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BACKGROUND AND OBJECTIVES

Polyphenols are naturally occurring compounds found in various plant-based foods and are widely known for their strong antioxidant and anti-inflammatory properties. These compounds have been found to alleviate the symptoms of many diseases. Previous clinical trials have highlighted their potential in reducing oxidative stress and inflammation, which are linked to mood disorders and mental health, however variations in bioavailability and individual responses highlighted the need for further studies to understand their full potential in treating depression and anxiety. Our meta-analysis and systematic review aim to assess the overall impact of polyphenol-based interventions in treating depression and anxiety.

METHODS

To perform this; PubMed, Web of Science, Cochrane Library, Embase and Scopus were systematically searched from their inception to March 2024. Studies were included in analysis; if they were in English and assessed the efficacy of polyphenol-based interventions in treating depression and/or anxiety via clinical trials (Randomized Controlled Trials or Cross Over Trials) in diverse populations (clinical or non-clinical populations). Pooled effect sizes were calculated using the random effect models with R version 4.3.3. Additionally, dose response meta-analysis was performed to understand the association between different doses and outcomes.

RESULTS

RESULTS indicated that polyphenol-based interventions possess potential to treat depression and anxiety disorders with statistically significant RESULTS; (1) depression with an effect size measured as standardized mean difference (SMD): -0.54; [95% CI: -0.74; -0.34] and anxiety with SMD : -0.50; [95% CI: -0.83; -0.16] as compared to control conditions. Funnel plot and Begg's test did not report any publication bias. With dose response analysis, it was observed that increase in dose was associated with decrease in effect size (outcome).

CONCLUSIONS

Our findings support the efficacy of polyphenol based interventions in improving depression and anxiety disorders highlighting the significance of such interventions for better public health. Identification of potential confounders (age, health status) provided valuable insights regarding the need of personalised polyphenol interventions to maximize their effectiveness in clinical populations suffering with depression and anxiety. Future RCTs should aim to clarify the role of specific polyphenols and explore the mechanisms through which they influence mental health outcomes (depression and anxiety) in populations of different age groups.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP06_14

PREGNANCY WEIGHT GAIN AMONG SLUM-DWELLING PREGNANT WOMEN: A QUASI-EXPERIMENTAL STUDY

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BACKGROUND AND OBJECTIVES

Inadequate gestational weight gain is associated with adverse pregnancy outcomes and remains prevalent in low- and middle-income countries (LMICs). This study aimed to enhance pregnancy weight gain through home-based nutritional counseling and micronutrient supplementation in a slum setting of an LMIC.

METHODS

This quasi-experimental, community-based study enrolled pregnant women before 16 weeks of gestation, with follow-up until delivery. Women in the intervention group received monthly home-based nutritional counseling from trained community health workers and daily supplementation with iron-folic acid, calcium, and vitamin D. The control group received no intervention. Monthly anthropometric measurements were conducted until 36 weeks, followed by weekly measurements. Baseline socio-economic status, food security, dietary diversity, and pregnancy-related data were collected. Weight gain during the second and third trimesters was evaluated using US Institute of Medicine (IOM) guidelines based on baseline BMI. Multivariable logistic regression identified factors associated with pregnancy weight gain. Data were analyzed using STATA 15 and R 4.4.0.

RESULTS

Data from 237 women in the intervention group and 159 in the control group were analyzed. Mean pregnancy weight gain was significantly higher in the intervention group (9.8 ± 3.9 kg) than in the control group (8.5 ± 3.5 kg; $p < 0.05$). A greater proportion of underweight (39% vs. 17%) and normal-BMI women (29% vs. 13%) in the intervention group achieved optimal weight gain per IOM guidelines ($p < 0.05$). Preterm birth rates were lower in the intervention group (15% vs. 22%), while cesarean deliveries (56% vs. 58%) and low birth weight (28% vs. 27%) were similar. Multivariable logistic regression showed higher odds of adequate weight gain in the intervention group overall (aOR 2.8, 95% CI 1.4–5.8), among underweight (aOR 4.7, 95% CI 1.5–17), and normal-BMI women (aOR 2.7, 95% CI 1.2–6.2).

CONCLUSIONS

Home-based nutritional counseling and micronutrient supplementation improved pregnancy weight gain in undernourished and normal-BMI women in urban, resource-poor settings. Further research is needed to address birth outcomes such as low birth weight and high cesarean rates.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP06_15

NUTRITIONAL STATUS AND DIETARY INTAKE OF 2–7-YEAR-OLD CHILDREN FOLLOWING VEGAN, VEGETARIAN, AND OMNIVOROUS DIETS

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BACKGROUND AND OBJECTIVES

Little is known about how a vegan diet affects the nutritional status of the youngest children. To understand the potential risks and benefits, we studied the diet and nutritional status of children following vegan, vegetarian, or omnivorous diets.

METHODS

MIRA2 Study was a cross-sectional study conducted in Helsinki, Finland in 2021-2022. Families were invited through day care centres. Anthropometric measurements, 3-day food records, and blood samples were available from a sample of 27, 16, and 27 children following vegan, vegetarian and omnivore diets, respectively, aged 2 to 7 years.

RESULTS

The vegan group had a lower median [25th-75th percentile] protein intake (2.3 [1.9-2.7] vs. 2.9 [2.5-3.1] g/kg body weight/day), lower serum lysine (109.3 [103.1-118.6] vs. 134.7 [119.3-155.6] µmol/l) and higher serum glycine (549.9 [485.7-621.7] vs. 459.5 [417.2-482.8] µmol/l) concentrations than the omnivore group (multiple comparison adjusted p-values <0.05). Two (7%) children in the vegan, three (19%) children in the vegetarian and none in the omnivore group fulfilled criteria for mild anaemia (haemoglobin <112g/l). No differences in mean red blood cell volume, serum ferritin, serum folate, or serum transcobalamin-bound vitamin B12 concentrations were observed between groups, and the individuals with mild anaemia did not consistently group to any extreme in these markers related to possible causes of anaemia. Furthermore, no differences were observed for total serum 25-hydroxyvitamin D and plasma retinol concentrations. Vitamin D supplementation was nearly universal (100%, 100%, 92% for among the vegan, vegetarian and omnivore groups, respectively). All children following a vegan diet received vitamin B12 both from supplements and fortified products. No differences in the height-for-age z-scores based on the Finnish reference were observed.

CONCLUSIONS

In a child population where parents' adherence to supplementation recommendations for a vegan diet is high and use of fortified foods is widespread, a carefully executed vegan diet RESULTS in an adequate status of vitamins A, B12, and D. However, vegan and vegetarian diets in children may be associated with higher prevalence of mild anaemia. Findings on factors potentially related to haemoglobin concentrations remain inconclusive. The observed lower serum lysine concentrations warrant further research on protein quality in vegan diets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 09 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP09_01

PREVALENCE AND FACTORS ASSOCIATED TO ANAEMIA AMONG ZAMBIAN WOMEN AGED 15 – 49 YEARS OLD. DATA ANALYSIS OF THE 2018 ZAMBIA DEMOGRAPHIC AND HEALTH SURVEYS

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BACKGROUND AND OBJECTIVES

Anaemia is one of the major public health concerns among women of child bearing age in globally. However, there is limited information on the factors associated with anaemia among women in Zambia. Therefore, the aim of this study was to determine the prevalence of anaemia and its associated factors among women age 15 – 49 years in Zambia using the 2018 Demographic and Health Survey data. We used secondary data from the 2018 demographic health survey (ZDHS)

METHODS

A total number of 13, 683 women who took part in the 2018 ZDHS, alongside the associated factors were included in the study. Data extraction from the ZDHS datasets, including data analysis (both descriptive and inferential) were undertaken using the Statistical Package for Social Sciences (SPSS) version 27. Descriptive statistical analysis was used to generate the frequencies/percentages. Binary logistic regression analysis was carried out to determine the most significant factors associated with anaemia among women in Zambia.

RESULTS

The prevalence of anaemia among women aged 15 – 49 years was 30%, with 16% being mildly, 13% being moderately, and 1% being severely anaemic. Anaemia prevalence was higher in women of ages 30 to 49 (31.3%) compared to that of women below 30 years old (29.7%). Similarly, anaemia prevalence was slightly higher among urban respondents (30.6%) compared to their rural counterparts (30.2%). Additionally, pregnancy status ((AOR =0.617; 95%CI = 0.538- 0.708, P =0.001), marital status (AOR1.324; 95%CI 1.196-1.467, P = 0.0001), employment status (AOR 1.086; 1.002 - 1.178 95%CI, P = 0.045), wealth index (AOR 1.152; 95%CI 1.020-1.300, p = 0.023), age (AOR 1.028; 95%CI 1.021 - 1.036, P = 0.0001), and total number of children ever born (AOR 0.922; 95%CI 0.898 - 0.945, P=0.0001) were associated with anaemia prevalence among Zambian women based on ZDHS.

CONCLUSIONS

The prevalence of anaemia among women in Zambia is high. Women should be sensitised on the importance of consuming iron rich foods and taking iron supplements during pregnancy. Emphasis should be more on the uneducated, unemployed, those with multiple births and low-income communities.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP09_04

ASSOCIATION OF FOLATE AND VITAMIN B12 CONCENTRATIONS WITH ADIPOSITY AND LIPID PROFILE AMONG ADULT WOMEN

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BACKGROUND AND OBJECTIVES

Vitamin B12 and folate are essential micronutrients that play crucial roles in human metabolism. Deficiencies in these vitamins have been linked to various health issues. There have been concerns about elevated folate concentrations after the implementation of folic acid fortification policies, especially in the context of vitamin B12 deficiency. This study investigates the association of serum folate and vitamin B12 concentrations with lipid profile and body composition in healthy adult females living in Saudi Arabia.

METHODS

This was a cross-sectional study of 157 apparently healthy adult Saudi females (18-60 years). Fasting blood samples were collected for folate, vitamin B12, and lipid profile analyses. Sociodemographic data were collected using a questionnaire. Anthropometric measurements were taken using standardized techniques, and body composition data was collected using a multi-frequency bioelectrical impedance device.

RESULTS

Women had a mean±SD age of 23.17±7.05 years and body mass index (BMI) of 23.6 ± 5.7 kg/m2. In total, 31% of the women had overweight or obesity (BMI≥ 25 kg/m2), and 36% had central obesity (waist circumference, WC ≥80 cm). The majority (>90%) had adequate serum vitamin B12 and folate concentrations, but 6.8% had insufficient vitamin B12 (≥200 - 300 pg/mL), and 16% exhibited elevated folate concentrations (>20 ng/mL). Significant correlations were found between lower vitamin B12 concentrations and adiposity indicators (overweight/obesity, WC ≥80 cm, and percent body fat >28%), and between lower serum folate concentrations and elevated WC ≥80 cm ($p< 0.05$). In multiple linear regression, higher serum folate concentrations were associated with higher total cholesterol [B=0.97 (95%CI: 0.14, 1.80)] and higher low-density lipoprotein [LDL, B=0.78 (95%CI: 0.05, 1.51)] concentrations, while vitamin B12 was positively associated with LDL [B=0.02 (95%CI: 0.00, 0.04)] after adjusting for age, BMI, smoking, and parity.

CONCLUSIONS

This study provides evidence of elevated folate status among Saudi women. Findings suggest that folate and vitamin B12 status play a role in adiposity and lipid profile, which needs to be further explored in men and other populations, taking into consideration dietary intakes and physical activity level.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP09_07

ASSOCIATIONS BETWEEN SOCIO-DEMOGRAPHIC FACTORS, LIFESTYLE, DIETARY PATTERNS, AND SLEEP BEHAVIOURS AMONG A POPULATION OF CHINESE UNIVERSITY STUDENTS

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BACKGROUND AND OBJECTIVES

Sleep disorders and insufficient sleep duration have become more common, especially among university students who encounter distinct challenges like academic stress and irregular schedules. This study aimed to investigate the relationships between socio-demographic characteristics, lifestyles, dietary patterns, and sleep behaviours among a population of Chinese university students.

METHODS

An investigation was conducted among 833 university students, collecting data on socio-demographic characteristics, lifestyles, dietary intake, and sleep behaviours. Dietary patterns were identified using factor analysis. Associations between variables, dietary pattern choices, and sleep outcomes were analysed using binary and ordinal logistic regression models, with adjustments for potential confounders.

RESULTS

Lower age was associated with fewer sleep problems. Males exhibited a higher prevalence of snoring and gasping, potentially linked to higher BMI. Individuals sleeping more than 8 hours having the lowest average BMI. Higher consumption of caffeine-containing beverages was associated with poorer sleep, while a diverse protein and plant-based diet showed a protective effect against certain sleep disturbances. Conversely, processed snacks and sweets diet negatively impacted sleep quality. Economic status emerged as a critical factor, with higher household income associated with healthier dietary patterns and fewer sleep disturbances. Conversely, lower income was linked to a greater likelihood of adopting a processed snacks and sweets diet, which negatively impacted sleep quality. National minorities were found to have a higher risk of sleep disturbances and were less likely to engage in diverse protein and plant-based, vegetable-rich, and legume and fish emphasis dietary patterns compared to Han participants. Additionally, lifestyle such as increased screen time was significantly associated with the choice of a processed snacks and sweets diet, further exacerbating sleep issues, while the impact of physical exercise on sleep was inconclusive.

CONCLUSIONS

These findings highlight the necessity of considering socioeconomic, cultural, dietary, and lifestyle contexts in developing interventions to improve sleep health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP09_08

PRESCHOOL STEM INTERVENTION MAY IMPROVE DIETARY QUALITY IN CHILDREN (3-5 YEARS): A QUASI-EXPERIMENTAL STUDY MEASURING SKIN CAROTENOIDS USING THE VEGGIE METER®

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BACKGROUND AND OBJECTIVES

Early exposure to fruits and vegetables (FV) can positively impact children's long-term dietary quality. This quasi-experiment study aimed to examine the effect of a preschool-based intervention on children's (3-5 years) dietary quality measured via skin carotenoid scores (SCS). The multi-level program was designed to improve children's dietary quality through early exposure to FV while engaging in high-quality science learning experiences.

METHODS

The study was conducted during the 2023-2024 school year in seven preschools serving families from historically marginalized backgrounds across three counties (one urban, two rural) in one state within the United States. The intervention group (IG) (*n*=12 classrooms) implemented the program, while the comparison group (CG) (*n*=15 classrooms) implemented the standard curriculum. Intervention teachers received 12 hours of training. IG children received 12 hands-on science activities, six food-based activities, and four outdoor gardening activities (January-May). Researchers measured children's height, weight, and SCS using the Veggie Meter®, a validated pressure-mediated reflection spectroscopy device (0-800 range). Scores reflected diet quality in the prior 6-8 weeks and were measured at baseline (T1), pre-intervention (T2), and post-intervention (T3). Repeated measures ANOVA was used to analyze changes over time and between groups.

RESULTS

A total of 182 children (52.7% female, 57.1% Black, 59.3% healthy weight) participated (*n*=87 IG, *n*=95 CG). Significant differences were observed at baseline between SCS and BMI z-scores. Both groups' SCS showed negligible increases (+4 points) during the first half of the school year (T1 to T2). During the intervention period (January-May), SCS increased in both groups (IG T2=253.1, T3=298.99; CG T2=226.59, T3=255.85). The rate of change in SCS over time was not significant between groups; however, the IG demonstrated a 33% greater gain in SCS compared to the CG.

CONCLUSIONS

The study findings indicate that the PEAS intervention may improve dietary quality among children (3-5 years) from limited resource families, as evidenced by greater SCS gains in the IG. Similar rates in SCS changes across groups underscore the need to explore other mechanisms impacting diet. Integrating FV into early STEM learning may be one method for improving dietary quality among children from families with marginalized backgrounds.

CONFLICTS OF INTERESTS

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SOAP09_09

DIABETES INTERVENTION INVOLVING PERSON-CENTRED NUTRITIONAL EDUCATION (DINE-TRIAL)

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BACKGROUND AND OBJECTIVES
Diet is an important part of reaching glycaemic targets in Type 1 Diabetes (T1D). However, evidence on the Nordic diet's impact on glucose is limited. In addition, it is unknown if person-centred diabetes education METHODSare used in Sweden due to the lack of a structured programme. The **DINE** trial is a randomised controlled trial which aims to evaluate the efficacy of a pre-assessed nutritional education intervention in comparison to standard care and short dietary advice in adults with T1D. The study will examine the intervention's impact on glucose levels, diet, lipids, blood pressure and BMI.
METHODS

The DINE trial is a non-blinded, randomised parallel group study conducted in Sweden. The primary hypothesis is that a person-centred, group-based nutritional education has an impact on glucose time in range for adults with T1D. A total of 54 adults, ≥18 years, diagnosed with T1D >12 months, with an HbA1c level >57 mmol/mol, and a BMI ≥ 25 kg/m2 will be enrolled. Data collection includes food diary and food frequency questionnaire, self-reported food enjoyment, physical activity level, glucose measured by continuous glucose monitoring, Hba1c, lipids, blood pressure, height, weight and BMI. All measured at baseline and at six months. The intervention will be conducted by a study dietitian and is underpinned by theories of adult learning and designed in co-creation with patients. The intervention is also supported by a model for person-centred care involving three routines:1) Initiating a partnership 2) Working in partnership 3) Safeguarding the partnership. Participants allocated to the intervention group will receive an individual pre-assessment followed by group-based nutritional education programme with a study dietitian.

RESULTS

Participant recruitment will commence in January 2025 and the nutritional education programme will run during 2025. Differences in dietary patterns and outcome variables from baseline to study endpoint at six months will be investigated between intervention and control group. The diet data will be analysed by measuring adherence to the EAT Lancet Planetary Diet and the Nordic Diet.

CONCLUSIONS

Through person-centred care, adults with T1D will not only gain essential knowledge about healthy eating but also achieve better blood glucose control and potentially reduce body weight. Furthermore, participants may enhance their understanding of lifestyle choices that can mitigate future diabetes-related complications.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP09_10

MATERNAL IRON NUTRITION DURING PREGNANCY AND FETAL INTRAUTERINE GROWTH

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BACKGROUND AND OBJECTIVES

Iron is critical for maternal and fetal health; however, the effect of iron nutrition on fetal intrauterine growth remains unclear. This study aimed to investigate the associations of maternal iron nutrition during pregnancy, combining iron supplementation, dietary iron, and iron status, with fetal intrauterine growth parameters among the Chinese population.

METHODS

This retrospective birth cohort study included 482 pregnant women. Maternal diets during pregnancy were collected by a semi-quantitative food frequency questionnaire, and other information in pregnancy was obtained by standard questionnaires. Maternal concentrations of serum ferritin and hemoglobin were detected. Fetal ultrasound examinations in the second and third trimesters were conducted by professional physicians in the study hospital. Quantile regression or linear regression models were applied to assess the associations.

RESULTS

Participants took iron supplementation in early, mid, and late pregnancy accounted for 19.1%, 40.3%, and 37.8%, respectively. Iron supplementation in the first and second trimesters and total iron intake in pregnancy were positively associated with fetal intrauterine growth parameters at some percentiles. Compared with those without iron supplementation in the second trimester, women with iron supplementation in the second trimester had 0.37 (95%CI=0.24-0.49), 0.37 (95%CI=0.26-0.48), 0.15 (95%CI=0.04-0.26), and 0.52 (95%CI=0.42-0.61) higher z-scores in fetal biparietal diameter, femur length, abdominal circumference, and estimated fetal weight at the 50th percentile in the second trimester, respectively. Maternal serum ferritin and hemoglobin concentrations in the first and second trimesters were positively correlated with several fetal growth parameters.

CONCLUSIONS

Fetal intrauterine growth may benefit from maternal iron nutrition in the first and second trimesters.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP09_11

TODAY'S MENU: ADHERENCE TO MEDITERRANEAN DIET IN CROATIA

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BACKGROUND AND OBJECTIVES

There is a strong relationship between lifestyle and human health. Over the past few decades a healthy lifestyle, particularly diet, has entered the spotlight of media and research. One of the most important links between diet and non-communicable diseases is obesity, which represents a major risk factor for different health conditions (e.g. diabetes, cardiovascular diseases, cancer, etc.). According to EUROSTAT, Croatia is the country with one of the highest overweight and obese ratios in Europe, yet it is a Mediterranean country as well. On the other hand, a balanced Mediterranean diet (MedD) is considered one of the best choices for maintaining human well-being and health. This paradoxical situation led us to assess the dietary habits of the Croatian population with a focus on MedD patterns.

METHODS

To achieve our aim, we adapted a validated 14-point *Mediterranean Diet Adherence Screener* for an online assessment, where most of the questions were accompanied by a few photographs of representative food items and portion sizes, defined according to the national food consumption data. Moreover, we created a 7-day dietary plan, following the Mediterranean Diet (MedD) pattern and compared the price with an average balanced dietary plan.

RESULTS

Based on the RESULTS of a validated questionnaire (N = 3326), we assessed the MedD adherence score to be 7.6±2.5. More detailed statistical analysis showed that women, residents of a coastal part of the country, older volunteers, those possessing a higher education degree, those with higher income, and those with lower BMI were associated with higher scores. The repeatability study had a 50.6% response rate among the participants who agreed to participate in an additional study (N=335) and showed good reliability of RESULTS. Based on the ordinal logistic regression, income was one of the major predictors of MedD score. Therefore, we saw an opportunity to target low-income citizens to refine their diet. We tailored a 7-day dietary plan with a daily average cost of 9.5 € compared to a traditional balanced plan (11.25 €). Moreover, by choosing cheaper ingredients, the menu cost could be decreased to slightly below 7 €.

CONCLUSIONS

In this study, we showed that the Croatian population moderately practised adherence to the MedD and detected the target groups for promoting MedD beneficial aspects. By turning to MedD and improving lifestyle, it is possible to save money, prevent diseases, and even navigate ageing, are not these enough to take action?

CONFLICTS OF INTERESTS

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SOAP09_12

SUSTAINABILITY LOGOS AND CLAIMS ON FOOD PACKAGING AND LABELS: THE CASE OF TURKIYE

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BACKGROUND AND OBJECTIVES

Sustainable food labelling takes into account the ecological footprint, which encompasses CO2 emissions and water usage throughout the food's production, processing, storage, packaging, and distribution phases. Sustainability logos or claims on food products can potentially boost their appeal to consumers. This study aims to examine the current status of such practices in Türkiye and to provide scientific insights for producers.

METHODS

Markets with branches across all 81 provinces in Türkiye were selected. At one store in a central district of Ankara's 1st Region, the sustainability-related logos or claims on food packages were analysed. A total of 3,085 food packages were reviewed to check for logos indicating sustainability features, such as Animal Welfare, Organic Certification, Recyclable Packaging, Green Dot, Rainforest Alliance Certification, Local Production, Geographically Indicated Products, Good Agricultural Practices, and Vegan/Vegetarian designations.

RESULTS

All supermarkets had recycling bins in-store, and signs promoting reusable shopping bags were displayed near checkout areas. The recycling logo was present on 87.4% of products; ÇEVKO green dot on 22.2%; Organic Production on 0.3%; Animal Welfare Certification on 0.13%; Local Production on 4.5%; Geographically Indicated Product on 0.3%; Rainforest Alliance on 1.0%; Vegan/vegetarian labelling on 0.4%; and the Good Agriculture Logo on 0.7% of products.

CONCLUSIONS

This study predicts that sustainability logos on products will increasingly contribute to sustainable development by raising awareness among consumers. However, the current number of sustainability-related labels on food products is limited, highlighting the need for more widespread and visible labelling. Encouraging the food industry to create environmentally friendly products with sustainable packaging is essential. Although no specific evidence was found on how to enhance the visibility of sustainability labels, this study underscores the importance of making these labels clear and comprehensible for consumers. Future research should focus on identifying ways to increase consumer response to sustainability labels.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP09_13

PROMOTION OF EXCLUSIVE BREAST FEEDING IN LEBANON THROUGH A SALUTOGENIC INTERVENTION

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BACKGROUND AND OBJECTIVES

Breastfeeding is a crucial public health priority due to its positive impact on maternal and infants' health and well-being. The WHO recommends breastfeeding initiation within the first hour after birth and exclusive breastfeeding (EBF) for 6 months. Despite widespread efforts and programs designed to reinforce exclusive breastfeeding, rates lag behind targets. A peer support, salutogenic approach was introduced to assist women in perceiving the challenging breastfeeding journey as comprehensible, manageable and meaningful hence, fostering a higher sense of coherence (SOC). This study aims to assess the impact of a salutogenic intervention on maternal SOC, on the initiation and duration of exclusive breastfeeding.

METHODS

A randomized controlled trial was implemented where 101 women residing in Lebanon, were randomly assigned to either an intervention (n=52) or a control group (n=49). Both groups received standard breastfeeding education at the maternity ward. In addition to the standard antenatal care, the intervention was facilitated by 4 infant feeding helpers (IFH), who created WhatsApp groups and delivered four informative and supportive videos at different time intervals. In the WhatsApp groups, IFHs encouraged mothers to self-identify "General Resistance Resources" (GRR)s, to describe coping mechanisms, and to express the role of BF in their life. Videos were designed to enhance manageability by giving relevant information and helpful coping techniques. Measured outcomes included breastfeeding initiation, duration, the evolution of SOC and its dimensions (Comprehensibility, manageability and meaningfulness). The change in pre-post SOC and SOC parameters scores between control and intervention groups was analyzed with Quade non parametric.

RESULTS

Rates of EBF at 6 months was higher among the intervention group's participants as compared to standard care (36.5% vs. 10.2%, p=0.00). SOC increased from baseline to six months postpartum in both groups, with a more significant change observed in the intervention group (F=11.358, p=0.001).

CONCLUSIONS

The salutogenic intervention demonstrated significant improvements in SOC and led to an increase in EBF rates. This study underscores the importance of comprehensive support systems to enhance maternal well- being, breastfeeding initiation and duration.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP09_14

THE EFFECT OF BETAINE SUPPLEMENTATION ON SEX HORMONES IN OVERWEIGHT/OBESE PRE-MENOPAUSAL FEMALES

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BACKGROUND AND OBJECTIVES

Betaine supplementation may increase total testosterone concentrations in young athletic males. However, no studies have evaluated the effects of betaine supplementation on sex hormones in females. This study therefore aimed to evaluate the effects of betaine supplementation on sex hormone concentrations in overweight and obese premenopausal females.

METHODS

The participants (n = 35) were premenopausal females aged 18–35 with BMI > 25 kg/m2. The study was a randomized double-blind placebo-controlled trial with a parallel-group design. The participants were randomly allocated to the betaine group (3 g/day) or the placebo group (maltodextrin) for eight weeks. Blood samples and saliva were collected before and after the intervention for sex hormone analysis. Hormone concentrations were determined with commercial ELISA kits. The data were analyzed using repeated-measures ANOVA.

RESULTS

The baseline characteristics of the participants were: body mass 87.7 ± 14.0 kg; body fat percentage: 45.0 ± 6.5%; and body mass index (BMI): 31.5 ± 4.2 kg/m². There were no significant differences in sex hormone concentrations after betaine supplementation (Table 1).

Table 1. Sex hormone concentration changes with betaine and placebo.

	BETpre	BETpost	PLpre	PLpost	p-value
Salivary testosterone (pmol/L)	191±29	210±29	171±27	194±26	0.930
Plasma testosterone (nmol/L)	1.76±0.19	2.16±0.16	1.81±0.17	2.09±0.14	0.567
DHEA-S (µmol/L)	3.92±0.45	3.93±0.51	4.61±0.40	4.61±0.45	0.983
SHBG (nmol/L)	49.1±8.5	59.9±16.7	34.1±7.5	32.6±14.7	0.640
Estradiol (pmol/L)	494±111	573±133	326±98	287±117	0.408

DHEA-S, dehydroepiandrosterone sulfate; SHBG, sex hormone-binding globulin

CONCLUSIONS

In conclusion, betaine supplementation has no effect on sex hormone concentrations in overweight and obese premenopausal females.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 12 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP12_02

HOUSEHOLD SOCIODEMOGRAPHIC CHARACTERISTICS AND FOOD AWAY FROM HOME TRENDS IN MALAYSIA: AN ANALYSIS OF THE HOUSEHOLD EXPENDITURE SURVEY

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BACKGROUND AND OBJECTIVES

Post-pandemic, households significantly changed the way they purchase and obtain food, necessitating further examination to understand the shifts in food spending behaviours. This study aimed to examine food expenditure patterns at the national level and across households of different sociodemographic characteristics.

METHODS

Descriptive analyses were carried out using data from the Household Expenditure Survey (HES), a national survey carried out by the Department of Statistics Malaysia, to examine household food expenditure trends from 1993 to 2022. Food at home and food away from home expenditure were expressed as a share of total household food expenditure and in nominal and real terms to adjust for the effect of inflation. Base-year analysis and compound annual growth rate were used to measure the growth in food at home and food away from home consumption. Food expenditure trends were further analysed at the household level by strata, size, income level and age group of the head of household.

RESULTS

The RESULTS show that Malaysian households have been gradually shifting from food at home to increased spending on food away from home, and this shift is particularly evident post-pandemic. In 2022, Malaysian households spent 48.4% of their total food expenditure on food away from home—the highest share recorded compared to previous years. Between 2019 and 2022, food away from home expenditure grew at a compound annual growth rate (CAGR) of 9.4%, about four times higher than food at home (2.4%). Despite the constant rise in nominal spending on food at home, its real spending has remained stagnant. In contrast, food away from home spending has been increasing in both nominal and real terms, suggesting that households either consume more outside meals or opt for more costly options but maintain the consumption quantity of food at home. At the household level, bigger, middle-aged and higher income households exhibited a more rapid shift towards increased food away from home consumption. Both urban and rural households experienced similarly rapid growth in food away from home consumption.

CONCLUSIONS

Although the shift towards eating out is progressing at different rates across households, this change in food preference is pronounced among all groups, highlighting the growing significance of food away from home in the Malaysian diet. Considering these trends when designing and evaluating health and nutrition policies is imperative in addressing the potential challenges posed by the increased consumption of food away from home.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP12_03

Effects of the Red Apron Project: a Case Analysis of Shimokajiro Danchi, Fukushima Prefecture through Mixed METHODSResearch

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BACKGROUND AND OBJECTIVES

The Red Apron Project is a reconstruction initiative designed to improve the dietary habits of disaster victims and revitalize communities. Following the Great East Japan Earthquake of 2011, The Ajinomoto Foundation (TAF) collaborated with residents in affected areas to conduct 3,771 cooking classes over eight and a half years. According to third-party evaluations, the project contributed to the physical and mental recovery of disaster victims and enhanced their quality of life (1). Particularly, it helped strengthen social cohesion among the evacuees in Fukushima Prefecture who could not return to their hometowns. This study examines the effects of the Red Apron Project, focusing on a community association in Fukushima Prefecture that has organized self-run cooking classes over the past four years.

METHODS

This study employed a convergent mixed METHODSdesign. A focus group interview was conducted from March to April 2024 with 14 volunteer residents from a disaster public housing complex in Fukushima Prefecture. Subsequently, an anonymous questionnaire survey was conducted with 120 individuals who had been evacuated after the nuclear power plant accident. The survey asked about participants' experiences with cooking classes and their food dietary variety scores (DVS), which were measured on a scale of 0–10 (2).

RESULTS

Shimokajiro Danchi was developed in 2015 (3). TAF conducted 13 cooking classes with 228 participants to encourage residents to leave their houses and engage in cooperative activities. Currently, the community association holds cooking classes every three months. The survey achieved a response rate of 85.8 %. Respondents had a mean age of 70.3 ± 16.5 years. Of all the respondents, 17.5% attended regular cooking classes.The mean DVS was 2.8 ± 2.4 points, with participants of the cooking classes scoring a higher mean DVS of 4.1 ± 2.1 points compared to non-participantspoints ($p<0.01$). Participants reported that cooking classes provided valuable opportunities to socialize, strengthen community cohesion, prevent isolation, and foster personal growth. The participants appreciated the simplicity, originality, and nutritional balance of the recipes. Non-participants cited health issues and busy schedules as reasons for not attending. Overall, the cooking classes promoted self- and mutual help among residents, encouraging them to support each other.

CONCLUSIONS

Participation in cooking classes resulted in reduced isolation, improved dietary habits, and better overall quality of life. At the community level, the project strengthened social cohesion and fostered self- and mutual help among the residents.

CONFLICTS OF INTERESTS

Yuri Kinoshita(The Ajinomoto Foundation, Commissioned research funding）

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SOAP12_04

ASSOCIATION BETWEEN FOOD CONSUMPTION OF BRAZILIAN SCHOOLCHILDREN AND THE INTERSECTION OF RACE/SKIN COLOR AND GENDER

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BACKGROUND AND OBJECTIVES

The food consumption of adolescents is characterized as inadequate. Gender, race/skin color, income, and their intersection can influence this consumption. The objective of this study was to analyze the relationship between food consumption and intersections of race/skin color and gender among Brazilian adolescents.

METHODS

Data from Brazil's National Student Health Survey 2019 was used. A total of 10 analytical categories (exposure) were designed, based on the intersection of binary gender (man and woman) and race/skin color (white, black, brown, Asian, and Indigenous), to represent social identities. As outcomes, the regular intake (5 or more times a week) of three subgroups of fresh or minimally processed food (beans, fruits, and vegetables) and two subgroups of ultra-processed foods (sweet treats and soft drinks) were assessed. Crude and adjusted (for a score of goods and services, age group, administrative dependency, and region) Poisson regression models were used to estimate prevalence ratios (PR).

RESULTS

There was a difference in food intake among the analytical categories in both crude and adjusted models. In adjusted analysis, regular intake of fruit and vegetables was higher among white men compared with other groups. In three of the five food subgroups analyzed (beans, vegetables, and sweets), black (PR 0.94, 0.79, and 1.48, respectively), brown (PR 0.91, 0.89, and 1.42, respectively) and Indigenous women (PR 0.85, 0.82 and 1.38, respectively) exhibited a statistically significant disadvantage when compared with white men (reference category), with a lower frequency of healthy food and higher of unhealthy food. Brown, Asian, and Indigenous men presented higher PR of regular intake of beans in comparison to the reference category. Brown women had lower PR for regular intake of soft drinks (PR 0.87).

CONCLUSIONS

The study identified racial and gender inequalities in food consumption among the analytical categories, with a worse scenario for women, especially those black, and Indigenous.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP12_05

ANTENATAL CARE SEEKING AND MATERNAL SUPPLEMENT USE IN BANGLADESH: PRACTICES AND PREFERENCES OF PREGNANT WOMEN

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BACKGROUND AND OBJECTIVES

In Bangladesh, differences between public and private antenatal care (ANC) services influence pregnant women's (PW) knowledge, perceptions, attitudes, and practices (KPAP) regarding ANC and maternal supplements, including iron-folic acid (IFA), calcium, multivitamins, and multiple micronutrient supplements (MMS). This study examines PW's KPAP about ANC services and their impact on supplement purchase and consumption.

METHODS

This mixed-METHODSstudy enrolled 3,486 PW (2,338 in intervention and 1,148 in control sub-districts) from five divisions in Bangladesh over 15 months (August 23–November 24). Roughly 30% of PW were excluded because they do not plan to purchase supplements during pregnancy. The primary outcome was KPAP related to ANC services; secondary outcomes included supplement purchase and consumption (IFA, MMS, or multivitamins). Qualitative interviews captured perceptions and attitudes toward ANC and supplementation. Quantitative data were analyzed using descriptive statistics.

RESULTS

Most PW (80%) received ANC information from family and friends, and doctors (76%). Nearly all PW (98%) had at least one ANC visit, averaging four visits per pregnancy. 69% of PW preferred private facilities due to perceived better care and access to medications, 4% preferred public facilities, 24% used both, and 3% did not seek ANC. Supplement purchases were high: 93% among private and 87% among public facility users. Among private facility users (n = 2,127) in MMS available areas, 42.7% purchased IFA, 16.7% MMS, 0.14% multivitamins, 33.3% all three supplements, and 7% none. Among public facility users in MMS available areas (n = 621), 32.5% purchased IFA, 24% MMS, 0.32% multivitamins, 32.7% all three supplements, and 10.5% none. Calcium purchases were higher among public facility users (76%) than private (61%). Qualitative data indicated PW preferred MMS over IFA due to better availability, no unpleasant odor, and fewer side effects.

CONCLUSIONS

Bangladeshi PW preferred private facilities for ANC due to perceived superior care, which influences KPAP and supplement consumption. Despite high ANC utilization and supplement purchase, disparities between public and private sectors persisted. MMS was preferred over IFA due to its advantages. Study findings are generalizable to 68% of PW planning to purchase supplements in this study; they underscore the need to engage the private sector alongside improving public services, enhancing communication, and promoting MMS to improve maternal and newborn health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP12_06

A FOLLOW-UP STUDY ON THE PUBLIC-PRIVATE PARTNERSHIP IN THE "GHANA NUTRITION IMPROVEMENT PROJECT" ANALYZED WITH MIT D-LAB'S P.ACT (PARTNERSHIP CO-DESIGN TOOLKIT)

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BACKGROUND AND OBJECTIVES

The "Ghana Nutrition Improvement Project" led by The Ajinomoto Foundation (TAF) aims to improve nutrition of children aged 6 months to 24 months by providing a nutrition supplement called "KOKO Plus", which is added to traditional complementary food, koko, corn-base porridge. TAF is engaged in a collaboration with Ghana Health Service (GHS), Ministry of Health to deliver effective nutrition education to mothers, which is considered to be a key factor for the success of the project

In 22nd IUNS-ICN the authors reported the result of the analysis on the partnership between GHS and TAF by using P.ACT Toolkit, which was developed by MIT D-lab. Through the workshops between GHS and TAF, it was confirmed that achieving the financial sustainability of the project was the common objective. Then they set up a roadmap toward financial sustainability, agreed on KPIs (Key Performance Indexes) The objective of this study is to evaluate the progress of the partnership using the agreed KPIs

METHODS

KPIs agreed in the previous P.ACT workshop were reviewed by conducting workshops with the participation of representatives from GHS and TAF members, which were facilitated by the author and the result was analyzed to evaluate the progress of the partnership.

RESULTS

As the key joint efforts to provide nutrition education to caregivers by GHS and TAF, the food demonstrations in the communities were conducted to disseminate knowledge on nutritionally balanced diets with the reference to "KOKO Pus". Peer to Peer education of health workers of GHS was effective in enhancing their capability and motivation. It turned out to be the cost effective method to achieve behavior changes of caregivers for better nutrition.

Through the effective collaboration between GHS and TAF as the public-private-partnership, there was steady progress in achieving financial sustainability of the project.

CONCLUSIONS

The public-private-partnership strengthened through P.ACT analysis has become the key success factor to make the nutrition improvement project more successful and sustainable.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP12_11

Post-weaning RESULTS from a Randomized Controlled Trial on Weight and Cardiometabolic Risk Factors - Effects of Breastfeeding Promotion Intervention and Dietary Treatment in Postpartum Women with Overweight and Obesity

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BACKGROUND AND OBJECTIVES

Postpartum women face an elevated risk of weight gain, with prolonged potential consequences including increased risk of cardiometabolic disease. Breastfeeding has been proposed as a potential mitigating factor against this risk. We examined the effects of a breastfeeding promotion intervention (BPI) and a dietary treatment (Diet) for weight loss postpartum on body weight and cardiometabolic risk factors after lactation cessation.

METHODS

We used a 2 x 2 factorial design to assess the independent and combined effects of BPI and Diet. Pregnant women (n = 156) with a pre-pregnancy body BMI of 25 to 35 kg/m² were recruited and randomly assigned to four groups: BPI, Diet, both treatments, or no treatment. We measured body weight, body composition, waist and hip circumferences, markers of glucose and lipid metabolism, and blood pressure at 2 weeks postpartum (baseline), at 6 months postpartum, and after weaning (> 12 months postpartum). The data were analyzed using linear mixed models to investigate the effects of the treatments on weight and cardiometabolic risk factors post-weaning.

RESULTS

The post-weaning visit included 89 women and was performed at a median (25, 75 percentiles) of 15.8 (13.0, 21.1) months postpartum. Among all women, > 75% breastfed for 12 months or longer. Among women who received BPI, median (25, 75 percentile) duration of breastfeeding was 14.0 (11.0, 20.0) months, while women who did not receive BPI breastfed for 14.5 (12.5, 19.5) months ($P = 0.31$). There were no effects of BPI on breastfeeding duration, use of infant formula, or any of the cardiometabolic outcomes at 6 months postpartum or post weaning. Reductions in weight and percentage fat mass from Diet at 6 months postpartum ($P < 0.001$) were still statistically significant post weaning ($P < 0.05$). Favorable effects on waist and hip circumference, fasting glucose and insulin concentrations observed at 6 months postpartum ($P < 0.05$) were no longer evident post weaning and no effects were observed on blood lipids or blood pressure.

CONCLUSIONS

BPI as implemented among these long-breastfeeding Norwegian women did not affect breastfeeding duration, body weight, or cardiometabolic risk factors. Diet resulted in a reduction in body weight and percentage fat mass at both 6 months postpartum and post weaning.

CONFLICTS OF INTERESTS

Kirsten B. Holven has received personal fees from Sanofi, unrelated to the content of this manuscript. The authors declare no potential conflict of interest.

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SOAP12_12

EVALUATION OF THE YES TO VEG! PROGRAMME, A FOOD SYSTEMS APPROACH TO PROMOTE VEGETABLE ACCESS IN PRE-SCHOOL AGED CHILDREN ATTENDING NURSERIES IN SOCIOECONOMICALLY DEPRIVED AREAS OF GLASGOW, SCOTLAND

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BACKGROUND AND OBJECTIVES

Vegetables are important sources of nutrients for optimal growth but pre-school age children in socioeconomically deprived households in the UK are less likely to consume them. Facilitating access to vegetables in children's nursery food environment could promote vegetable intake through increased exposure and by children gaining "vegetable" agency. We evaluated the immediate impact of Yes to Veg!, a 4-week nursery-based intervention targeting 3-5y children living in socioeconomically deprived areas of Glasgow, Scotland.

METHODS

A quasi-experimental study. Parents-child dyads were recruited from 11 nurseries (6 intervention/5 controls) and parents completed pre- and post-questionnaires. Yes to Veg! delivered 2 types of locally, organically grown fresh vegetables over 4 weeks (intervention). Nursery staff were provided with suggestions for using the vegetables [imaginative play (i.e. shopping, cooking); sensory activities]. Control nurseries were given general healthy eating recommendations. Outcomes in children were parental reported exposure (vegetables tried from a 27-item list), consumption frequency (1=once/week to 5=everyday) and variety consumed (0=none, 1=1-4, 2=5-9, 3=10+ kinds). Vegetable agency was children's vegetable-related engagement/activities at nursery and home reported by parents, nursery staff and from researcher observations.

RESULTS

Of 257 parent-child dyads recruited only 57 (n=34 intervention, n=23 control) completed both questionnaires. Child mean(SD) age was 50(8) months. There were no statistical differences [Mean(SD)] in vegetables tried between intervention [total score pre 16.7(4.5) vs 16.8(5.6) post, difference 0.19(0.6) p=0.765] and control group [total score pre 16.4(5.3) vs 16.0(5.6) post, difference -0.39(0.57), p=0.503]. Median pre- and post-consumption frequency in both groups was 4 (most days); the variety of vegetables consumed differed between intervention (5-9) and control (1-4) and these measurements didn't change between pre- and post. Vegetable agency increased in the intervention; parents said children talked more about vegetables at home (91% vs 65% control) and were willing to try vegetables at home (41% vs 34% control); qualitative comments were positive for children's engagement (preparation, sensory activities), and overall increased interest.

CONCLUSIONS

Yes to Veg! facilitated exposure to vegetables, engagement and familiarisation, it was well received by the parents and nursery staff, but this was not reflected in consumption. The intervention duration and limited recruitment might have hampered impact.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP12_13

EFFECT OF EXERCISE AND ACUTE AND CHRONIC GALACTO-OLIGOSACCHARIDE SUPPLEMENTATION ON INFLAMMATION AND IRON ABSORPTION IN FEMALE ATHLETES

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BACKGROUND AND OBJECTIVES

Background: Iron depletion is particularly common in female athletes depending on the sports discipline. Endurance and resistance exercise can induce inflammation resulting in decreased dietary iron absorption. Galacto-oligosaccharides (GOS) are non-digestible fibres that selectively enhance the growth of beneficial gut bacteria. Although GOS improved iron absorption in young healthy women and infants, whether it has potential to improve iron absorption in athletes is uncertain.

Objective: To determine the effect of exercise and acute and chronic GOS intervention on inflammation and iron absorption in female athletes.

METHODS

In this single-arm stable iron isotope and intervention study, 22 female athletes aged 18 to 35 years with moderate or low iron status, each underwent 3 test conditions before and after a 5-week daily intervention with 10 g of GOS. Participants consumed a test drink containing labelled ferrous fumarate (fefum,54, 57, 58 Fe, 56 mg iron in total) 3 hours after: i) a period of rest, and ii)/iii) an acute resistance exercise bout at 70% 1 repetition maximum with and without co-administration of GOS. Iron status (Haemoglobin (Hb), ferritin, soluble transferrin receptor (sTfR)) was assessed at baseline and endpoint while inflammation markers (C-reactive protein (CRP) and alpha-1-acid glycoprotein) were measured on the morning of each test condition. Interleukin 6, hepcidin and serum isotope appearance were measured at several time points throughout each test day. Fractional iron absorption was determined 14 days after the last test drink in each phase. Sample analysis is ongoing, and RESULTS will be available at the conference.

RESULTS

Of the 89 screened participants, 27% had iron deficiency (ferritin<15 µg/L and/or sTfR>8.3 mg/L). Of the 22 that were enrolled, 20 completed the study. At baseline mean ± SD age was 21.2 ± 1.8 years and body fat % was 26.4 ± 6.0%. Median (IQR) body mass index was 22.0 (19.9 – 25.8). Estimated maximal oxygen uptake was 39.7 ± 5.9 mL/kg/min. Inflammation- and altitude-adjusted ferritin and Hb were 31.8 ± 12.4 µg/L and 12.2 ± 0.9 g/dL, respectively. Median high-sensitivity CRP was 0.86 (0.54 – 1.75) mg/L and 15% had low-grade inflammation (CRP>3 mg/L).

CONCLUSIONS

In young female athletes, iron deficiency may be compounded by exercise-induced inflammation. Strategies to enhance iron absorption are needed to maintain athletic performance and quality of life.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP12_14

EXPLORING FOOD AUTONOMY: A STUDY ON JOHANNESBURG ADULTS' CONTROL OVER FOOD CHOICES AND ACCESS

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BACKGROUND AND OBJECTIVES

Individuals demonstrate autonomy by using their own judgment to make decisions, driven by self-determined goals. Food choices, in particular, are influenced by the specific context and environment at any given moment. By assessing the extent to which individuals exercise their autonomy, we can gain deeper insights into the factors driving food choices. This understanding can then be used to inform and shape effective public health campaigns. The aim of this study was to investigate how adults in Johannesburg, South Africa, perceive their autonomy in relation to food choices and access to food.

METHODS

A qualitative research design was used. Four focus groups, consisting of a total of 40 participants recruited using convenience sampling, were conducted. Two research assistants with a graduate qualification facilitated the focus groups using a discussion schedule, with pre-determined statements. The principal investigator and research assistants underwent training and were supervised by experience qualitative researchers to ensure rigor and trustworthiness. The study complied with the ethical principles of the Declaration of Helsinki, 2013. Thematic analysis was used to identify main themes from the discussions.

RESULTS

Four main themes, 1) Food choice, 2) Food availability, 3) Food purchasing and 4) Food access, were identified. Healthfulness and the cost of food were mentioned as determinants of food choice, with convenience, household size, variety and satiation as smaller themes. Food shortages and purchasing power was discussed with regards to food availability. Under food purchasing, food cost was again identified, the idea of buying basics against buying luxuries and planning were also mentioned. Sub-themes related to food access were the type of places and distances to places for food purchases, as well as affordability.

CONCLUSIONS

The participants view, and perception of autonomy was not expressed outright, but emerged throughout the discussions, and related to the right and ability to choose food that they would prefer to eat, and in relation to their own goals, such as being healthy. In the decision-making process to reduce food costs, participants might increase their autonomy by enabling themselves to choose foods that would otherwise be expensive. Conversely, their autonomy could decrease if their choices are limited to discounted options. Further studies can be conducted to compare the extent of which autonomy is exercised based on participants characteristics, socio-economic class or across different regions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP12_15

CORRELATES OF FOOD INSECURITY AMONG UNIVERSITY STUDENTS IN A DISADVANTAGED SOCIOECONOMIC AREA IN FRANCE

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BACKGROUND AND OBJECTIVES

The higher education student population is particularly concerned by food insecurity (FI), although data collected in France is limited and varies depending on socio-economic contexts. This cross-sectional study aims, 1) to assess the prevalence of FI among university students in a socioeconomically disadvantaged area, 2) to assess the association of FI with perceived school dropout, and 3) to describe the socioeconomic, demographic and academic factors, as well as the cooking and eating conditions associated with FI.

METHODS

An online survey was conducted (Nov 2022 to Jan 2023) among 5068 students (22% of the university population) enrolled at a university located in a low socioeconomic area. FI was assessed using a question with three response modalities: not having access to enough food (i.e. quantitative FI); not having access to the desired food (i.e. qualitative FI); having access to enough of the desired food (i.e. food security). Weighting was calculated (compared to the overall student population of the university) using gender, study level, field of study, country of high school diploma obtention, and training status. Multivariate multinomial logistic regression models were used to identify associations between i) FI and school drop-out; ii) socioeconomic and demographic data, academic-related data, cooking and eating conditions and FI.

RESULTS

Among respondents, 60% were women and 21% reported financial difficulties ≥4 (out of 5). After weighting, 11% and 35% reported quantitative and qualitative FI, respectively. In multivariable analyses, students reporting quantitative or qualitative FI were more likely to report school dropout than people reporting food security. Besides, reporting financial difficulties, living in a collective residence, not having cooking facilities at home, being an undergraduate, having obtained high school diploma abroad, not cooking frequently, relying on food aid and eating alone regularly were positively associated with both quantitative and qualitative FI. Being a man was associated only with quantitative FI. ($P<0.0001$)

CONCLUSIONS

This study reported a concerning prevalence of FI among students in a disadvantaged socioeconomic area. FI was associated with greater perceived school dropout, which may further increase socioeconomic inequalities. Both structural (e.g. socioeconomic status, accommodation type) and individual-level (e.g. cooking and eating conditions) factors were found to be associated with FI. These findings provide insight into the characteristics of students more likely to experience FI and to be the target of interventions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 15 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP15_02

POLICE MISTRUST AND DIET QUALITY: EXAMINING THE IMPORTANCE OF PSYCHOSOCIAL FACTORS IN PREDOMINANTLY BLACK COMMUNITIES

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BACKGROUND AND OBJECTIVES

Policing practices in communities of color in the United States is an important public health issue. This study examined how police mistrust is associated with dietary quality.

METHODS

In this cross-sectional study, we analyzed 2021 data from 724 adults living in randomly selected households in two predominantly Black Pittsburgh, Pennsylvania communities; participants were mostly Black (90.6%), low-income (median household income $17,500), and women (79.3%). We quantified paths between police mistrust and dietary quality (measured by Healthy Eating Index [HEI]-2015) through perceived stress, community connectedness (i.e., how close respondents felt with their community), and subjective social status.

RESULTS

Dietary quality was poor (mean HEI-2015 score=50, out of possible range: 0-100) and mistrust of police was high: 78% of participants either agreed or strongly agreed that something they say might be interpreted as criminal by the police due to their race/ethnicity. Police mistrust was associated with lower perceived social status = - 0.03 (95% confidence interval [CI]: -0.05, -0.01) and lower community connectedness = - 0.03 (95% CI: -0.05, -0.01). Police mistrust was marginally associated with low dietary quality (β= - 0.14 (95% CI: -0.29, 0.02). Nineteen percent of the total association between police mistrust and lower dietary quality β=-0.16 (95% CI: -0.01, -0.31) was explained by an indirect association through lower community connectedness.

CONCLUSIONS

Police bias and mistrust may play a role in community connection, social status, and ultimately poor dietary quality for Black Americans. Addressing police mistrust continues to be an urgent public health issue.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP15_03

ENABLERS AND BARRIERS OF FEEDING OF SMALL AND/OR SICK NEWBORNS IN GHANA

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BACKGROUND AND OBJECTIVES

Ghana's rising neonatal mortality rates (NMR) have prompted the government to prioritize improving the quality of newborn care, with a focus on specialized care for small and/or sick newborns (SSNBs), including creating an enabling environment for breastfeeding and appropriate feeding practices. This study explored the perspectives of health providers, mothers, families, and communities on current practices, barriers, and facilitators of quality, family-centered nutritional care for SSNBs during inpatient care and post-discharge.

METHODS

A descriptive cross-sectional design was employed to collect qualitative data through 56 individual interviews with health care providers and mothers/caregivers of inpatient and post-discharge SSNBs. Additionally, four focus group discussions were conducted with family members and key community influencers at six public hospitals in a large urban area in Ghana.

RESULTS

Almost all SSNBs were fed breastmilk both during inpatient care and after discharge. Organizational enablers for high breastmilk feeding (BMF) rates in SSNB care units included trained health workers providing respectful and quality counseling, accessible places for breastfeeding or expressing milk, and the availability of feeding supplies, such as feeding tubes, cups, and functional refrigerators for alternative feeding methods. However, health providers reported that staff shortages and heavy workloads negatively impacted the quality of feeding support provided.

Interpersonal and community-level enablers included caregivers' positive experiences with support, both from health care providers as well as emotional and social support from family members, especially fathers. Family level support was defined as help with meal preparation, baby care, and respecting mothers' decisions to feed breastmilk or use alternative feeding methods. Conversely, barriers included low attendance at postnatal care and SSNB follow-up visits, as well as a lack of home-based feeding support from community health workers.

CONCLUSIONS

Emotional and social support from family and community members, alongside acceptance of alternative feeding methods, facilitated BMF during inpatient care and post-discharge. Increased workloads among health care providers were identified as barriers to optimal counseling and support for mothers of SSNBs, particularly for BMF and alternative feeding methods. The limited availability of post-discharge follow-up emerged as a significant barrier requiring further investigation and intervention.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP15_04

REFUGEE SETTLEMENT SERVICE WORKERS ROUTINELY USE PRINT INFORMATION RESOURCES TO ASSIST REFUGEE CLIENTS WITH FOOD SECURITY CHALLENGES

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BACKGROUND AND OBJECTIVES

During resettlement, refugees are susceptible to food insecurity.[1,2] In high-income countries, settlement service workers provide expertise and information, including food security information, to refugee clients.[3] In Australia, between 12,500-17,500 refugees are resettled annually.[4] Australia has a large range of food security-related information resources but their use in settlement support work has not been systematically investigated. The objective was to explore perceptions of settlement workers regarding their use of food security-related resources with refugee clients and to identify opportunities for resources to better assist refugees with food and nutrition security in the new food environment.

METHODS

This descriptive, qualitative study adopted a subjective realism perceptive. One-on-one interviews with refugee resettlement workers were conducted between June-August 2024. The Technology Acceptance Model (TAM) constructs were used to frame the interview guide and analysis. NVivo was used for analysis.

RESULTS

Of the 14 workers interviewed, four had lived refugee experience, and all were health professionals, of which 64% were doctors, nurses or dietitians. All routinely used print food and nutrition security-related information resources with their clients as they were perceived to build capacity and scope of practice. Print, pictorial, translated, and co-designed resources were perceived to be the most useful. Less useful were resources with limited cultural tailoring, translation issues, limited topic range, and high literacy demand. There was limited use of digital resources due to perceived variations in digital access and digital literacy levels amongst refugee clients. There was widespread recurring use of the same food and nutrition resource range, as most workers' perception was that new resources were too difficult to find. Opportunities for improvement included streamlining access, addressing topics such as clinical deficiencies related to chronic food insecurity, and increasing culturally-nuanced translation. A need was identified for more resources for settlement workers regarding the food cultures and dietary patterns of refugee populations resettling in high-income countries.

CONCLUSIONS

Settlement workers perceive food security-related resources to be a valuable component of resettlement service but access issues and topic gaps limit their potential in-situ. Co-designed development of culturally-appropriate resources, streamlining resource access, and leveraging distributed food literacy may help better address some food security challenges faced by refugee populations in their new countries.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP15_05

DETERMINANTS OF CHILDHOOD UNDERNUTRITION IN HO INDIGENOUS COMMUNITY OF JHARKHAND, INDIA

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BACKGROUND AND OBJECTIVES

Childhood undernutrition, a significant barrier to growth and development, is common among Indian tribal children. Jharkhand, a biodiverse-enriched state of India, is home to Ho indigenous community, that is known to access nutrient-dense indigenous foods (IFs) yet have poor nutrition. A study was conducted to assess dietary intake and nutritional status of under-five Ho indigenous children and examine role of different factors towards their nutritional status.

METHODS

We conducted cross-sectional study in nine randomly selected villages of West Singhbhum district in Jharkhand. Household surveys elicited information on sociodemographic and food access profile. 2-day non-consecutive 24-hour dietary recall (n=272) and anthropometric assessments (height and weight) (n=255) were conducted for diet and nutritional status assessments. Data analysis was conducted in R.

RESULTS

Diets of Ho children (6 months-5 years) were deficient in calories, essential vitamins (vitamins A, B1, B2, B3, C, folate), and minerals (iron, calcium, and zinc), in comparison to estimated average requirements for Indian children. Only 9.2% children consumed minimum adequate diet (≥5 food groups), with average diet diversity score of 3.1 ± 0.7. Many children (84.5%) reported IF consumption, mostly limited to local rice varieties. Less than half the children (39-43%) received hot cooked meals and take-home ration as part of government supplementary feeding programs. High prevalence of undernutrition was observed, with 24% children wasted, 34% stunted, and 40% underweight, partially concordant with state-level prevalence (wasting -25.2%, stunting-44.9%, and underweight-46.4%). Multivariate logistic regression revealed higher odds of wasting in younger children (<2 years) (OR: 0.5, $p<0.05$) than older children. In contrast, risk of stunting was 2.9 times higher in children aged 2-3 years, than younger children (<2 years) (OR: 2.9, $p<0.05$). Children with literate mothers had significantly ($p<0.05$) lesser odds of stunting (OR:0.4) and underweight (OR: 0.5), in comparison to children with illiterate mothers.

CONCLUSIONS

Sub-optimal dietary intake and high levels of undernutrition in Ho children, could be attributed to underutilization of nutrient-rich IFs, poor functioning of supplementary feeding programs, and limited literacy of caretakers. A multifaceted approach combining evidence-based targeted food-based interventions, nutrition literacy, and behaviour change strategies may address undernutrition in Ho children.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP15_06

DEVELOPMENT AND EVALUATION OF A HEALTHY EATING INDEX FOR ZAMBIA

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BACKGROUND AND OBJECTIVES

Healthy diets play a crucial role in malnutrition and contribute to the reduction in burden of diet-related diseases. Zambia experiences a triple burden of malnutrition, which encompasses chronic undernutrition, micronutrient deficiencies, as well as overweight and obesity. To reduce these, the Zambian government established food-based dietary guidelines (FBDG's) in 2021 but adherence remains unclear. We aimed to develop and evaluate the Zambian Healthy Eating Index (Z-HEI) to assess adherence to the FBDG's.

METHODS

The 2021 Zambian FBDG's were translated into the Zambian Healthy Eating Index (Z-HEI). The Z-HEI comprises ten distinct food groups and seven food subgroups, which together form 17 components categorized into four specific categories: adequacy, optimum, moderation, and quality. Each category employs a unique scoring method, yielding a total score ranging from 0 (no adherence) to 130 (maximum adherence).

Z-HEI scores were calculated using an existing dietary intake dataset from 2022 which included data from 397 women of reproductive age from Choma and Mazabuka in Zambia. Six weighed dietary intake recalls were collected by multipass 24-recall method, and scored according to the Z-HEI score. Associations were examined between quartiles of the Z-HEI score and the mean probability of adequacy (MPA).

RESULTS

The mean Z-HEI score was 53.9 (SD = 5.8), with minimum and maximum scores of 34.7 and 75.6, respectively. High adherence was observed for saturated fat, unsaturated fat, eggs, red meat, and whole grains, while low adherence was noted for fruits, fruit variety, dairy, and legumes. MPA across participants was 0.7 (range: 0–1). PA for vitamin C, riboflavin, and calcium was 0.1. However PA's for zinc, iron, vitamin A, folate, and vitamin B6 exceeded 0.8. Associations across quartiles did not increase from Q1 to Q4 and no meaningful correlation between the Z-HEI score and MPA ($\tau = 0.07$, $p < 0.001$) was found.

CONCLUSIONS

Adherence to the food-based dietary guidelines was low. We found no meaningful correlation between Z-HEI score and the MPA, suggesting that Z-HEI may not reflect micronutrient status. However, the primary aim of FBDG's is to promote healthy diets and reduce the incidence of non-communicable diseases, which encompasses more than MPA. Future research should focus on evaluating the Z-HEI in conjunction with other healthy diet indicators and apply the Z-HEI in larger, nationally representative datasets from Zambia to capture greater variability in dietary intake in relation to Z-HEI scores.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP15_07

A SYSTEMATIC REVIEW AND META-ANALYSIS ON DIETARY BEHAVIOURS AND THE DEVELOPMENT OF OBESITY: AN OBCT STUDY

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BACKGROUND AND OBJECTIVES
Obesity prevalence has reached an epidemic proportion, which RESULTS from contextual and individual risk factors including dietary behaviours such as snacking habits or cooking skills. Young adults are particularly vulnerable to gaining excessive weight following changes in dietary behaviours or habits which can be partly explained by countering life transitions such as starting a new job, cohabitation, or starting a family. Systematically evaluated high quality evidence on the influence of various dietary behaviours on the development of obesity is, however, lacking. The objective of this systematic review and meta-analysis is thus to evaluate the available evidence on the longitudinal association between various actionable dietary behaviours and obesity development in (young) adults.
METHODS

The systematic review followed PRISMA 2020 guidelines and was registered in PROSPERO [ID:CRD42024611490]. A literature search in Medline, Embase and APA PsycInfo was performed up to November 20, 2024, in collaboration with a medical librarian. We will include prospective cohort studies and RCTs conducted in the general population aged 18–40 years at baseline. Included dietary behaviours are: meal frequency, timing or skipping; snacking; portion size; eating rate or speed; cooking skills; mindful eating; purchasing habits; social eating; and eating out. The primary outcome is defined as obesity development (BMI ≥30 kg/m²); secondary outcomes are overweight, morbid obesity, changes in BMI, weight and adiposity. Risk of bias will be assessed using the Cochrane Risk of Bias tool and the Newcastle-Ottawa Scale. ASReview and Covidence software will be used for screening and for data extraction and quality appraisal, respectively.

RESULTS
This systematic review is currently in progress. The search string yielded 44,469 unique hits, and we are now in the process of screening titles and abstracts. RESULTS will be available at the time of the conference.
CONCLUSIONS
The RESULTS will reveal knowledge gaps, inform future research priorities, and will inform dietary guidelines on actionable dietary behavior recommendations to prevent obesity in young adults, a population vulnerable to excessive weight gain and in which early obesity prevention is key in order to reduce chronic disease incidence later in life.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP15_09

COMMERCIALLY PRODUCED FOOD FOR CHILDREN AGED 6-36 MONTHS AND POLICY GAPS IN CHINA

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BACKGROUND AND OBJECTIVES

Providing nutritious, safe, diverse, and affordable foods for children aged 6-36 months is critical. The market for commercially produced complementary foods (CPFC), such as instant cereals, purées, and snacks, has grown significantly in China, from $0.5 billion in 2008 to $7.5 billion in 2022[1]. This study evaluates the current state of CPFC in China and identifies policy gaps to inform future regulations.

METHODS

1. Analyzed national databases and literature to assess the dietary intake and nutrient status of Chinese children aged 6-36 months.

2. Conducted surveys with 368 caregivers to understand CPFC usage and purchase motivations.

3. Reviewed national CPFC standards and legislation for alignment with international guidelines.

4. Established a CPFC database and evaluated products using national and international standards for nutrient composition and labeling practices.

RESULTS

Dietary assessments revealed excessive protein intake and insufficient calcium, vitamin B1, and vitamin C consumption among children aged 24-36 months. While most caregivers (86.27%) prepare complementary foods at home, 85.97% also purchase packaged CPFC. A total of 1,017 CPFC samples from 21 brands were collected, representing 57% market coverage. Compliance with Chinese infant food standards varied by category: 100% for mixed purées, 77.2% for cereal products, 69.4% for fruit and vegetable products, 38.9% for meat products, and 24.3% for dairy products. Snacks, candies, and beverages universally failed to meet standards.

CONCLUSIONS

While China has implemented comprehensive laws, policies, and guidelines largely aligned with WHO recommendations and CODEX, but there still some gaps remain in CPFC quality and compliance. Strengthened regulatory frameworks and consumer education are needed to ensure CPFC support optimal child nutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP15_11

APPETITE LOSS ACROSS THE LIFESPAN: INSIGHTS FROM BIOLOGICAL MARKERS

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BACKGROUND AND OBJECTIVES

Appetite loss affects 15–30% of older adults, leading to reduced energy intake, nutritional deficiencies, malnutrition, and increased mortality. Age-related changes in metabolism and digestion can worsen appetite loss and nutrient deficiencies, accelerating the aging process. Following that, knowledge regarding biological markers of aging such as epigenetic clocks (Horvath's, Hannum's, PhenoAge, GrimAge) might offer insights into these mechanisms. Therefore, the objectives are to compare biological markers of aging in older adults with and without appetite loss and to explore its association. Understanding the biological mechanisms behind appetite loss can help identify risks and develop targeted solutions to improve nutrition, health, and independence for healthy aging.

METHODS

This cross-sectional study utilized data from the INSPIRE T cohort in France, which aims to enhance healthy aging by identifying biomarkers associated with aging and age-related diseases. By 2024, 47 out of the included 1,099 participants reported appetite loss. A case-control design was implemented, matching these 47 cases with 94 controls based on sex, age, and body mass index (BMI). Descriptive statistics and logistic regression analyses were performed to compare biological markers, adjusting for psychological state, weight loss, medication use, and cognitive function.

RESULTS

The 141 matched participants had similar characteristics in terms of sex (68% women), age (mean 74 years), and BMI (mean 26 kg/m²) due to the matching design. However, participants with appetite loss (cases) reported taking more medications (6 vs. 3 per day), exhibited greater weight loss (17% vs. 2%), and showed more depressive symptoms (68% vs. 28%). Detailed RESULTS and tables will be presented at the conference.

CONCLUSIONS

This study found no significant associations between biological markers of aging and appetite loss. As a pioneering study investigating how aging biology relates to appetite loss, these RESULTS may have been influenced by the use of a single-question assessment, which did not capture the severity of appetite loss. Future investigations using the INSPIRE dataset will address this by using a measure of appetite severity. Additionally, a larger sample size and longitudinal design will be essential to better understand the mechanisms underlying appetite loss and to develop targeted interventions for promoting healthy aging.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP15_12

DIABETES-RELATED DIETARY PATTERNS AND ENDOMETRIAL CANCER RISK AND SURVIVAL IN THE EPIC STUDY

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BACKGROUND AND OBJECTIVES

Endometrial cancer (EC) major risk factors include obesity and diabetes, both strongly related with lifestyle choices and dietary factors. (1) Our study aimed to evaluate the relationship between diabetes related dietary patterns (DP) and EC risk and survival in a population of middle-aged European women.

METHODS

A total of 285.418 female participants from the European Prospective Investigation into Cancer and Nutrition (EPIC) study were included in the present analysis. (2) In total 1.955 incident EC cases were registered, of those 380 women died, including 133 from EC.

The Empirical Dietary Index for Hyperinsulinemia *EDIH,* (3) the Empirical Dietary Index for Insulin Resistance *EDIR*, (3) and the Diabetes Risk Reduction Diet *DRRD,* (4) were estimated from dietary information collected at baseline from EPIC participants. (2) Cox proportional hazards regression models were used to evaluate the association between the diabetes-related DP and EC risk, using hazard ratios (HR) and 95% confidence intervals (CI), and adjusting for relevant confounders. Cox and Fine-Gray models were used to assess the association of DP with overall and EC-specific mortality respectively.

RESULTS

The mean BMI was 24.68 Kg/m² (SD 4.3), EC cases had a higher BMI 26.85 Kg/m² (SD 5.3), and a larger waist circumference 84.26 cm (SD 12.6). Higher adherence to EDIR and EDIH was associated with an increased risk of EC. Multivariable HR for the highest versus lowest tertile of adherence were 1.19 (95%CI = 1.06-1.34) for EDIR and 1.14 (95%CI = 1.01-1.27) for EDIH. However, when BMI was included in the models, these associations became weaker and no longer statistically significant for both EDIR 1.11 (95% CI = 0.99 to 1.25) and EDIH 1.07 (95% CI = 0.95-1.20). No associations were observed between EC risk and adherence to DRRD. Higher associations between adherence to EDIR and EC risk were observed among women with overweight and obesity HR 1.16 (95% CI = 1.00-1.35) as for the group of physically inactive women HR 1.24 (95% CI = 1.07-1.44). No relevant differences were observed among subgroups for the other DP. No associations were found in relation to the three diabetes-related DP and survival.

CONCLUSIONS

This study highlights the potential role of etiology-derived DP in disease prevention. The link between diets that promote hyperinsulinemia, insulin resistance and the increased risk of developing EC is mediated by BMI. Overweight, obese, and physically inactive women appear to be at a higher risk when adhering to dietary patterns such as EDIR.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 18 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP18_01

A COMMUNITY ASSET MAP OF CONTEXTUAL DETERMINANTS OF ENVIRONMENTAL FACTORS INFLUENCING NUTRITION, WELLBEING AND SOCIAL ENGAGEMENT OF OLDER ADULTS

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BACKGROUND AND OBJECTIVES

Older adults living in urban communities from low socioeconomic backgrounds are more likely to reside in deprived neighbourhoods and experience poorer health outcomes. Understanding the influence of neighbourhood environments on dietary choices, physical activity, and social engagement is crucial for developing targeted interventions. The objective of this research was to explore neighbourhood food, social and physical environment as contextual factors influencing nutrition, physical and social activity of older adults living in an inner-city community.

METHODS

A community asset mapping (CAM) exercise was conducted as part of the incLusivE coMmunity fOod model for health wellbeiNg and sociAl connectedness of olDer pEople (LEMONADE) project (https://www.bournemouth.ac.uk/research/projects/lemonade). CAM is a strength-based approach to community development that focuses on assets, resources and promotes community engagement. The CAM approach enabled sequential identification, ranking and documenting of resources and barriers to healthy food options, improved physical and social activity in Bermondsey, an inner-city area in London. The mapping exercise included a community walk followed by an insight session to gain in-depth understanding of the facilitators and barriers. Inductive thematic analysis was conducted to develop and refine emerging themes.

RESULTS

Participants (n 7) were 71 (65-78) years old, 57% female, 85.7% were married, had compulsory schooling (71.4%), with annual household income less than £20,000 (57.1%) and were all retired. Places identified as important in influencing nutrition, physical and social activity included local grocery shops, pharmacies, post offices, community green spaces and betting shops. Emerging themes on facilitators included availability of green spaces, friendliness of staff, opportunities for socialisation and costs. Barriers included limited access to local markets, nutritious and fresh produce, cost, safety concerns, lack of accessible transport and limited offers of diverse social engagement activities.

CONCLUSIONS

This research provides insights into the contextual determinants of dietary choices, social engagement and physical activity of older adults living in socially-deprived urban areas. Comprehensive assessments that consider the combined influence of food access, social networks, and physical infrastructure on the health and wellbeing of older adults are required to enable the co-design of environments suitable for improving quality of life in older adults.

CONFLICTS OF INTERESTS

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SOAP18_02

FEEDING BEHAVIOUR AND SATIATION RESPONSES IN MALNOURISHED AND HEALTHY CHILDREN IN URBAN GHANA: IMPLICATIONS FOR CAREGIVER PRACTICES AND CHILD NUTRITION

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BACKGROUND AND OBJECTIVES

Infant malnutrition remains a significant concern in Ghana. Feeding behaviour, especially children's capacity to regulate energy intake, is essential to preventing malnutrition and energy regulation could play a key role in maintaining healthy weight and growth. This study evaluated feeding behaviour and satiation responses in undernourished children (moderate acute malnutrition (MAM) and/or stunting) compared to healthy peers in urban Ghana.

METHODS

The study had two phases. Phase one was a cross-sectional assessment (n=262) that used the International Complementary Feeding Evaluation Tool (ICFET) to examine feeding behaviours. Phase two was an experimental crossover preload study (n=41) conducted in the homes of participants. Healthy and malnourished children consumed a high (average 100kcal)- or low (9kcal/100ml)-energy drink before an ad libitum lunch (energy intake assessed using bomb calorimetry), assessing their compensation ability. Variation in food energy compensation was related to nutritional status, categorizing the children into three groups: less than 30% compensation (little to no regulation), 30-100% (normal compensation), and over 100% (overcompensation).

RESULTS

There were 41 children (17 MAM, 12 stunted and 12 healthy) involved in the study. MAM children demonstrated significantly lower appetite scores (-0.27 ± 1.1 vs 0.10 ± 0.9, p=0.01), higher food refusal (0.22 ± 1.1 vs -0.08 ± 0.9, p=0.032), and elevated caregiver feeding anxiety (0.49 ± 1.0 vs -0.18 ±1.0, p <0.001) compared to healthy children. In the preload study, the median compensation index (COMPX) was 24.6% (P25/75 =-10.5, 24.6), indicating limited energy compensation across groups. Notably, 41.2% of MAM and 66.7% of stunted children exhibited minimal or no compensation, while 35.3% of MAM children overcompensated. No stunted children overcompensated (p=0.023). Healthy controls demonstrated a median compensation of 35.2 % (P25/75= 11.1, 102.7).

CONCLUSIONS

The study highlights significant variations in eating behaviour and some possible differences in appetite regulation between malnourished and healthy children. MAM children have lower appetite and more food refusal and may reach satiety faster, whereas stunted children may eat beyond hunger. Interventions focusing on caregiver feeding practices and responsive feeding behaviors may enhance energy balance and reduce malnutrition risk in Ghanaian children.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP18_03

ADDRESSING ACUTE MALNUTRITION USING A HOLISTIC MULTICRITERIA APPROACH BEYOND WEIGHT GAIN (IN A PRECLINICAL MODEL)

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BACKGROUND AND OBJECTIVES

A staggering one million children die every year of undernutrition. The primary treatment is a paste-like product called Ready-to-Use Therapeutic food (RUTF). Recovery is measured by weight gain, however, other parameters such as linear growth, micronutrient status, and functional outcomes i.e. cognitive development and microbiome diversity could provide important indicators concerning nutritional status and recovery state. Until recently, WHO stipulated that a minimum of 50% of the protein in RUTF should come from dairy products (1), limiting product development, especially in sub-Saharan Africa, where the dairy industry is not well developed. However, in 2022, the CXG 95-2022-UNICEF Codex Guideline (2) allowed the use of non-dairy alternative formulations, opening opportunities for new product development. We have used a preclinical model to predict malnutrition and its recovery with two-fold objectives: 1) optimise RUTF for parameters beyond weight gain and 2) promote the use of African-based ingredients for RUTF to support local economies.

METHODS

3-week-old-Sprague Dawley female rats were assigned to 6 groups in a 6-week experiment with 8 rats per group. Rats were split into healthy (control diet) or undernourished (diet limited in protein), and after 3 weeks, fed the same diets, the commercial RUTF (peanut-milk based,with 13% protein), or the novel RUTF (African plant-based modified SMS: Soybean Maize Sorghum,with 18% protein) (3). Beyond the standard anthropometric measurements (weight and length), we measured bone quality, the gut microbiome (using 16S rRNA sequencing), and NMR metabolomics on stool and serum samples (4).

RESULTS

The undernourished rats fed the novel RUTF demonstrated significantly greater catch-up weight and length gain with the compared to the undernourished rats on the commercial RUTF or control diet. Furthermore, the healthy rats fed the commercial RUTF experienced less weight gain than those fed the novel RUTF (3). The bone quality, gut microbiome, and metabolomes also significantly differed by treatment group.

CONCLUSIONS

Our findings demonstrate that the novel, plant-based RUTF was superior to the commercial RUTF. Locally sourced, culturally acceptable, dairy-free, cost-effective formulations could offer a suitable alternative for developing accessible and efficacious malnutrition treatments. These preliminary findings generated through this multidisciplinary approach will guide RUTF optimisation, strengthen novel RUTF's scientific foundation, and pave the way for evidence-based clinical trials to improve global malnutrition treatment strategies.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP18_04

Multi-Trajectories of Macronutrient Intake and All-Cause Mortality, Hypertension among Chinese adults: RESULTS from the China Health and Nutrition Survey (1991–2015)

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BACKGROUND AND OBJECTIVES

Studies on the secular trend of the macronutrient intake, and its potential impact on the risk of all-cause mortality and hypertension have been inconclusive. The present study aimed to explore the long-term trajectories of macronutrient consumption and determine their association with all-cause mortality and hypertension risk among Chinese adults.

METHODS

We used the data from the China Health and Nutrition Survey, total of 9,661 participants were included in the analysis. Group-based multi-trajectory modeling was conducted to determine the multi-trajectory groups of macronutrient intake. And estimated their association with all-cause mortality and hypertension risk by Cox regression and binary logistics regression models, respectively. A restricted cubic spline was performed to determine the nonlinear relationships of mean macronutrient intake with mortality and hypertension.

RESULTS

Four trajectories groups were identified" moderate low protein, increasing high fat, decreasing low carbohydrate" (Group1), "moderate low protein, low fat, excessive carbohydrate" (Group2), "moderate increasing protein, moderate high fat, moderate low carbohydrate" (Group3)," moderate low protein, increasing fat, decreasing carbohydrate" (Group4). Compared with the Group3, both Group2 and Group4 were associated with higher risk of all-cause mortality (HR: 3.232, 95%CI: 2.155,4.845; HR: 1.601, 95%CI: 1.099,2.332, respectively), and showed a U-shaped relationship between mean energy intake proportion from protein, fat and carbohydrate with all-cause mortality(p for nonlinear < 0.001). Additionally, Group 1 and Group4 have positive association with risk of hypertension (OR: 1.201, 95%CI: 1.038,1.388; OR: 1.21, 95%CI: 1.026,1.426).

CONCLUSIONS

Relatively moderate increasing protein, moderate high fat, moderate low carbohydrate have a lower risk of all-cause mortality and hypertension. Considering the health effects can vary widely depending on the quality of macronutrient food sources. The causality of these connections is necessary to further determine and verification.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP18_08

MAPPING THE EXTENT OF IMPLEMENTATION OF SCHOOL FOOD AND NUTRITION INTERVENTIONS AT POLICY AND SCHOOL LEVELS IN KENYA

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BACKGROUND AND OBJECTIVES

In Kenya, undernutrition among adolescents remains high while overweight/obesity are increasing, especially in urban contexts. Schools have become important settings for implementing nutrition programs targeting adolescents. The objective of this study was to map the extent of implementation of comprehensive school food and nutrition programs (SFNPs) at policy and school levels in Kenya.

METHODS

A scoping review identified good practices indicators for implementation of SFNPs, classified into 26 components, across 5 domains: school premises, school community, external school food environment (SFE), school policy environment, and cross cutting issues. We conducted a desk review of national policy documents, semi-structured interviews (SSI) with policy makers (n=2) and program implementers (n=2), and a survey in 30 schools in Nairobi (urban) and Kiambu (peri-urban) combining school observations (n=30), including school kitchens, meals services and playgrounds, and SSI with school heads (n=30) and caterers (n=27).

RESULTS

At policy level, 19 components were partially or fully addressed in Kenyan policy documents. At school level, only the *Nutrition education* component was fully implemented; 14 were partially and 4 not implemented at all. Policy actions were strong in areas of *Food safety, Water, Sanitation, and Hygiene, Health and Nutrition services*, within the school premises, but could be better implemented at school level to align with existing policies. Other components, such as *Food provision*, *School gardens*, *Community capacity*, *Community involvement and Farmers livelihood* need to be strengthened both at the policy and school level. No policy actions targeted the external SFE. Cross cutting issues like *Gender, Inclusion*, and *Environmental sustainability* were only partially addressed in policy documents.

CONCLUSIONS

Substantial policy guidance and implementation of SFNPs exists in Kenya but focuses almost exclusively on the internal SFE. Several recommendations to policy makers and implementers at national, county, school, and community level emerged to strengthen implementation of comprehensive SFNPs. These recommendations orientated subsequent participatory workshops with the school community to identify and reflect upon the challenges and solutions to SFNPs implementation in urban and peri-urban settings in Kenya.

CONFLICTS OF INTERESTS

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SOAP18_09

THE ASSOCIATION BETWEEN TOTAL, ANIMAL-BASED, AND PLANT-BASED PROTEIN INTAKE AND COGNITIVE FUNCTION AND DECLINE IN COMMUNITY-DWELLING OLDER ADULTS

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BACKGROUND AND OBJECTIVES

Higher protein intake may benefit cognitive function, but the evidence is inconclusive. This study examined associations of total, animal-, and plant-based protein intake and cognitive function and decline in older adults.

METHODS

Data were analysed from 1,339 community-dwelling adults aged 55+ participating in the Longitudinal Aging Study Amsterdam. Protein intake, measured via a Food Frequency Questionnaire (2014–2015), was expressed as energy percentage (%E) from total, animal-, and plant-based sources. Cognitive domains—global cognition (MMSE), information processing speed (Coding task), episodic memory (15WT), and executive function (Word Fluency)—were measured every three years (2011–2021) and converted to z-scores. Linear mixed models evaluated associations between cognitive function and decline (testing interaction by age), adjusting for confounders including diet quality. Sex interactions were tested.

RESULTS

Mean protein intake was 1.1 g/kg/d (SD: 0.3). Higher protein intake (%E) was associated with lower episodic memory (Q2–Q4 vs Q1, β_Q4=-0.18 (-0.30;-0.06)) and faster decline in global cognition (Q3 vs Q1, β=-0.02 (-0.03;-0.00)) and processing speed (Q3 vs Q1, β=-0.02 (-0.03;-0.01)). RESULTS were comparable for total protein intake in g/adjusted kg/d. Animal-based protein intake was associated with faster decline in processing speed (Q3,Q4 vs Q1, β_Q4=-0.01 (-0.02;-0.00)). Plant-based protein intake was associated with higher processing speed in females only (Q4 vs Q1, β=0.31 (0.09;0.53)) and lower episodic memory (Q4 vs Q1, β=-0.16 (-0.30;-0.02)). No associations were found for executive function.

CONCLUSIONS

These findings suggest protein intake does not benefit cognitive function in older adults. Negative associations may relate to protein food sources.

CONFLICTS OF INTERESTS

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SOAP18_10

FOOD INSECURITY AND BODY MASS INDEX ARE ASSOCIATED WITH DEPRESSIVE SYMPTOMS AMONG ADOLESCENTS IN YOGYAKARTA PROVINCE, INDONESIA, DURING THE COVID-19 PANDEMIC: A ONE-YEAR LONGITUDINAL STUDY

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BACKGROUND AND OBJECTIVES

The COVID-19 pandemic has presented multifaceted challenges globally, impacting adolescent health. Among these, food security and nutrition are intertwined closely with mental health outcomes. In Indonesia, with its diverse socio-economic landscape, these interconnections may have been exacerbated by the pandemic. This study investigated the relationship between food security, nutrition, and adolescent mental health in Indonesia during COVID-19

METHODS

Longitudinal data were collected from 511 adolescent boys and girls in 2021-2022 in Gunungkidul district, Yogyakarta. Food security was measured using the Household Food Insecurity Access Scale, and the validated Kessler-10 Psychological Distress Scale was used to measure adolescent depression. Weight and height were measured to assess nutritional status. Anthropometric measurements were recorded twice, with an acceptable difference of 0.2 cm and 0.1 kg. Multivariate linear regression and linear mixed-effects regression were employed to explore associations between these variables while adjusting for sex, age, pubertal status, and household income

RESULTS

There was a large reduction in depression from 28.3% in 2021 to 6.9% in 2022. Reversely, anaemia was more prevalent at follow-up (32.1%) compared to baseline (23.4%), and was more prevalent among girls compared to boys (year 2021: 33.5 vs 12.7 and year 2022: 45.5 vs 18.7, respectively). Notably, there was an improvement in the prevalence of inadequate diet diversity (7.5% vs 1.6%), a reduction in the consumption of high-risk foods (73.1% vs 32.7%), and an increase in food security (59.9% vs 67.5%) after one year of follow-up. In the longitudinal analysis, food insecurity score was positively associated with depressive symptoms (β: 0·72, 95 % CI 0·52, 0·92), while BMI z-score was inversely associated (β: −0·31, 95 % CI 0·68, −0·03). We found an increase in strength of association between food insecurity and depressive symptoms over time (moderately food-insecure: β: 1·36 (95 % CI −0·10, 2·83) to 4·63 (95 % CI 2·17, 7·09); severely food-insecure: β: 1·89 (95 % CI 0·36, 3·41) to 3·30 (95 % CI 1·50, 5·10).

CONCLUSIONS

Depressive symptoms were positively associated with food insecurity scores and inversely associated with BMI. Enhancing food access, improving nutritional status, and providing mental health support are crucial components of adolescent health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP18_11

IODINE INTAKE IN TRANSITION: FROM TABLE SALT TO PROCESSED FOODS IN SENEGAL

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BACKGROUND AND OBJECTIVES

Iodine is a vital micronutrient, essential for thyroid function and metabolic regulation. Universal Salt Iodization has been a global strategy to prevent iodine deficiency disorders. In Senegal, iodization of salt became mandatory in 2001. However, evidence shows declining household iodized salt coverage.This survey aimed to assess iodine status and household coverage of adequately iodized salt and to estimate the contribution of various dietary sources to iodine intake.

METHODS

This national cross-sectional survey, conducted in 2023, used stratified sampling across five geographic strata. Data were collected from 866 households and from 657 non-pregnant women aged 15-49 years. Household salt iodine concentration and urinary iodine concentration (UIC) were measured. Dietary iodine sources were apportioned to estimate intake from native sources, iodized salt in processed foods, and iodized household salt using statistical models integrating urinary sodium concentrations.

RESULTS

Coverage with adequately iodized salt was low (19%), with higher availability in urban areas (27% vs. 13%). Overall, median iodine concentration was low with 3.2 ppm. However, the median UIC of 252 µg/L indicated iodine sufficiency, yet regional disparities exist, with some areas showing more than adequate iodine levels. Women in urban areas showed higher UICs than those in rural areas, likely due to a higher contribution from adequately iodized salt. Household salt contributed modestly to iodine intake (9% in urban and 5% in rural areas), while processed foods, including bouillon, accounted for 49%, and native iodine sources for 44% of the dietary iodine intake.

CONCLUSIONS

Iodine sufficiency among Senegalese women, despite declining coverage of adequately iodized household salt, highlights the critical role of processed foods as a dietary iodine source. Strategies should focus on effective monitoring of iodized salt used in processed foods as well as on regular monitoring of iodine status to avoid excess intake while ensuring continued sufficiency in all population groups.

CONFLICTS OF INTERESTS

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SOAP18_12

EFFECT OF SEX AND OBESITY INDICES ON CARDIOMETABOLIC RISK AMONG CHILDREN AGED 10–16 YEARS

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BACKGROUND AND OBJECTIVES

Sexual dimorphism influences body composition and metabolic health, yet its impact on cardiometabolic risk (CMR) in children remains underexplored. The objectives of the study were to investigate the sex-specific differences in CMR and to assess the sensitivity of three obesity indices (% fat mass (FM), body mass index (BMI) and waist to height ratio (WHtR), to identify CMR in children aged 10–16 years.

METHODS

Healthy children (n = 3,563), aged 10–16 years, were assessed cross-sectionally for anthropometry and body composition (BOD POD, Cosmed, Italy). BMI, BMI-for-age Z-scores (BAZ), and WHtR were calculated. Obesity categories were defined by BAZ (>+1 SD), %FM (>85th percentile), and WHtR (≥0.5). CMR markers included Total cholesterol (TC), Triglycerides (TG), Low density lipoprotein (LDL), High density lipoprotein (HDL), and Glycated hemoglobin (HbA1c), with abnormalities defined using NCEP guidelines. Regression analysis, adjusted for age, was used to evaluate sex-specific differences in CMR across obesity indices (interaction effect), and Receiver Operating Characteristic (ROC) curves was used to assess the sensitivity of these indices in identifying CMR.

RESULTS

Mean age was 13.4±1.8 years; 54.9% were females. Obesity prevalence by BMI, %FM, and WHtR, was 18.7%, 16.2%, and 44.8%, respectively, while abnormal HDL, TG, HbA1c, TC and LDL were 38.6%, 25.5%, 16.2%, 2.8%, and 1.8%, respectively. A significant interaction was observed between sex and %FM categories for TC (β= 0.057, 95% CI: 0.003, 0.068, p=0.034) and HDL (β= 0.064, 95% CI: 0.009, 0.099, p= 0.018). Similarly, significant interaction between sex and WHtR categories was noted for TC (β= 0.066, 95% CI: 0.007, 0.056, p= 0.011) and TG (β= 0.061, 95% CI: 0.013, 0.138, p= 0.018), indicating significant sex differences for the specified parameters within %FM and WHtR categories. These differences were only observed within normal %FM and WHtR categories, with females having higher TC, TG, and lower HDL values. Using ROC, the optimal cutoff for identifying abnormal TC, TG, LDL, and HDL categories was WHtR of 0.5 and the 75th percentile for %FM. No significant sex differences were observed for BMI categories.

CONCLUSIONS

Sex-specific differences were observed in specific markers of CMR, within the normal categories of WHtR and %FM, with females having higher lipid levels. Simple indices of WHtR of 0.5 and 75th percentile of %FM can be used as effective screening tools for early identification of CMR in children.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP18_13

IMPACT ON FOOD INSECURITY AND WELL-BEING OF A "CASH PLUS" PROGRAM COMBINING CASH TRANSFERS, SOCIAL ORIENTATION AND WORKSHOP ON SUSTAINABLE DIETS: A RANDOMIZED CONTROLLED TRIAL AMONG VULNERABLE HOUSEHOLDS IN FRANCE

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BACKGROUND AND OBJECTIVES

At least 8 million people are food insecure in France. The current food aid system – mostly based on food distribution – suffers from various flaws (stigmatization, lack of choice, etc) resulting in high rates of non-use. Cash transfer (CT) interventions have proven their worth internationally but studies on CT in France are scarce and no study explored the impact of unrestricted CT on household (HH) food security. The objective is to evaluate the impact, implementation process and cost-effectiveness of the "Passerelle Plus" program, which aims to reduce food insecurity among vulnerable HH by combining three components: unrestricted CT, social orientation, and a workshop on sustainable diets.

METHODS

A randomized controlled trial was conducted in Montreuil, France. HH in vulnerable situations were enrolled and randomized into 2 groups: 1) intervention group received a CT (60€/month/HH member) distributed for 4 months through a payment card that can be used in any store and allows cash withdrawals, and was offered a meeting with a social worker for social orientation, and to take part in a group discussion workshop on sustainable diets; 2) control group received the full program after the evaluation phase. Indicators of food security (Household Food Security Survey Module, r-copying strategy index, diet diversity) and well-being (mental well-being scale, social isolation) were measured by questionnaire before program implementation (baseline) and after 3 and 6 months. Monthly HH food purchases were collected after 3 months to assess impact on diet quality and environmental impacts. Qualitative interviews were conducted to document HH use of and satisfaction with the program, and as factors that hindered or facilitated its implementation. Costs associated with program implementation were collected to measure program cost-effectiveness.

RESULTS

A total of 342 HH (1254 persons) participated in the program; 172 were in the intervention group and received the CT, 94 attended the workshop, 73 met with a social worker. A total of 342 participants completed the baseline questionnaire: 82% were food insecure, 68% did not use food aid, mean well-being score was 25. RESULTS on program effectiveness on food security, well-being and food purchase quality, as well as findings from qualitative survey are not available at the time of abstract submission but will be presented at the congress.

CONCLUSIONS

This study is the first large-scale trial of unrestricted CT-based programs in France. It will enrich the knowledge on feasibility and impact of CT programs and feed into the debate on policies to prevent food insecurity and fight social inequalities in health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP18_15

THE URBAN AND RURAL FOOD ENVIRONMENT IN ZAMBIA AND ITS ASSOCIATION WITH DIET QUALITY

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BACKGROUND AND OBJECTIVES

The food environment determines the food choices that people can make, yet evidence of the extent to which differences between urban and rural areas in low- and middle- income countries is limited. The nutrition transition is becoming more evident in Zambia with rising rates of non-communicable diseases (NCDs). This study aimed to assess the perceived food environment in relation to diet quality in a rural and urban area of Southern Province in Zambia.

METHODS

Data was collected from 411 women aged 18–49 in Choma and Mazabuka districts in Zambia with a general questionnaire for socio-demographic information, and an adapted Nutrition Environment Measures Survey–Perceived (NEMS-P) questionnaire for the food environment. Dietary intake was assessed using a quantitative multiple-pass 24-hour recall administered on six non-consecutive days for each participant over a 3-week period. Diet quality was determined using the Global Diet Quality Score total (GDQS), GDQS healthy, GDQS unhealthy and mean probability of adequacy (MPA). Anthropometric measures assessed body mass index (BMI) and waist-hip ratio (WHR). Linear mixed-effect models were applied to estimate associations between the perceived food environment and GDQS indicators.

RESULTS

Local markets, small grocery stores, and own food production were primary food sources in both areas. Participants had a moderate risk of nutrient inadequacy and NCDs-related outcomes (62%), with GDQS healthy scores of 8.8 ± 3.4 and unhealthy scores of 12.1 ± 1.7. Rural participants had higher unhealthy GDQS scores ($p<0.05$). The overall MPA was 0.7 (range 0–1), the PA for calcium, riboflavin, and vitamin C was low (range 0 - 0.1), while the PA for iron, zinc, vitamin A, folate, and vitamin B6 were higher (PA > 0.8). Overall, the perceived food environment showed limited association with diet quality. The availability of healthy food in the home was associated with lower unhealthy GDQS scores (5 – 6 healthy foods in the home: (β = -0.388 [95% CI -0.711, -0.065]); 8 – 10 healthy foods in the home: (β = -0.615 [95% CI -1.025, -0.206]). Conversely, the availability of 1 - 2 unhealthy foods in the home was positively associated with the overall GDQS score (β = 0.251 [95% CI 0.005, 0.497]) and GDQS healthy (β = 0.342 [95% CI 0.093, 0.590]).

CONCLUSIONS

The nutrition transition is still in its early stages in rural and urban Southern Zambia. This provides a unique opportunity for food environment interventions that should focus on promoting healthy foods while limiting unhealthy ones in the home and in the local markets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 21 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP21_01

INTRODUCTION OF BALANCED ENERGY PROTEIN (BEP) SUPPLEMENTATION THROUGH ROUTINE ANTENATAL CARE (ANC): CHALLENGES AND OPPORTUNITIES FROM A GLOBAL LANDSCAPE ANALYSIS

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BACKGROUND AND OBJECTIVES

Underweight pregnant women (BMI <18.5kg/m2) in nutritionally vulnerable populations remain at risk of delivering preterm, low birthweight, and small for gestational age (SGA) infants. Compiled evidence shows BEP supplementation in underweight pregnant women led to reduced risk of low birthweight, SGA, and preterm birth, and improved maternal outcomes (i.e. gestational weight gain). The World Health Organization (WHO) recommends balanced energy and protein (BEP) supplementation during pregnancy in contexts where prevalence of underweight among pregnant women is ≥ 20%. Yet, many countries have not operationalized this BEP recommendation as part of routine ANC service delivery. The objectives of this presentation are to 1) provide in-depth understanding of enabling factors and challenges in the implementation of BEP supplementation through routine ANC, and 2) discuss program recommendations to guide country programs.

METHODS
A landscape analysis was conducted, using a mixed METHODSapproach of 1) qualitative key informant interviews with 13 country and global stakeholders and 2) a literature review of previous studies on BEP supplementation. Interviews were recorded and transcribed. Themes and subthemes were analyzed using Dedoose software.
RESULTS

Our landscape analysis revealed low awareness of BEP recommendations within WHO ANC guidelines among country stakeholders, lack of inclusion of BEP in most country ANC guidelines, and lack of clarity and specificity in the recommendations for undernourished populations. Further, challenges identified include: BEP is often not part of ANC services, provider capacity for BEP provision is weak, and stock outs of BEP supplies. There is a need for cost-effectiveness data, and information on feasibility and country readiness for the introduction of BEP supplementation through ANC platforms.

CONCLUSIONS

Country program implementers should consider aspects of service delivery, product identification and supplies, consumer demand, acceptability and adherence to successfully integrate BEP into ANC platforms. Monitoring of BEP supplementation via routine health systems is also sorely needed. At a global level, development of implementation guidance, and standardizing the BEP definition and indicators can aid countries to monitor BEP implementation and outcomes.

CONFLICTS OF INTERESTS
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SOAP21_02

SHARED DRIVERS OF THE DOUBLE BURDEN OF MALNUTRITION AMONGST CHILDREN, ADOLESCENTS AND WOMEN OF REPRODUCTIVE AGE IN LOW- AND MIDDLE-INCOME COUNTRIES: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

The coexistence of multiple forms of malnutrition is a severe public health problem in low- and middle-income countries (LMICs), affecting millions of people. Shifting policies and programs to address multiple forms of malnutrition simultaneously requires a deep understanding of the problem and its drivers. This systematic review synthesizes the socio-economic and nutritional drivers of the double burden of malnutrition (DBM) within individuals, and mother/child dyads or households in LMICs.

METHODS

We conducted a comprehensive search of five databases from 2010 to 2025. Inclusion criteria were: 1) children under five (U5), older children and adolescents (5-19y), and women of reproductive age (WRA) with different forms of malnutrition in LMICs; 2) studies of association between drivers and individual, dyad/household DBM; and 3) cross-sectional studies; randomized controlled trials (RCTs); non-RCTs; and cohort studies. Risk of bias was assessed using the JBI critical appraisal tool. A narrative synthesis was then performed. The protocol was registered on PROSPERO as CRD42023421457.

RESULTS

Of 20,144 citations identified, 77 articles covering over 90 countries and 1 million participants were included. These predominantly cross-sectional studies provided mostly good-quality evidence. Regarding socio-economic drivers, at both individual (WRA/children U5) and dyad/household levels, there was substantial evidence in support of a positive association between maternal/paternal education, household income/wealth, urban residence, and DBM. At the dyad/household level only, food insecurity was also positively associated with DBM. In contrast, the presence or type of employment was not associated with DBM at any level. Regarding nutritional drivers (e.g. nutrition knowledge; dietary diversity; micronutrient supplementation), there was limited evidence supporting an association with DBM at any level, except for the presence of breastfeeding (vs. absence) which was negatively associated with dyad/household level DBM.

CONCLUSIONS

Our findings highlight the need for double-duty actions that address the socio-economic and nutritional drivers of DBM, such as improving education and income opportunities, reducing food insecurity, and promoting breastfeeding. Policymakers and practitioners should prioritize these interventions to reduce the burden of malnutrition in LMICs.

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CONFLICTS OF INTERESTS

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SOAP21_03

INFANT FEEDING PRACTICES IN MALI: A QUALITATIVE STUDY OF MOTHERS, GRANDMOTHERS, FATHERS AND ELDERS IN RURAL AND URBAN AREAS

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BACKGROUND AND OBJECTIVES

Sub-Saharan Africa, including Mali, continues to experience high under-five mortality rates. Exclusive breastfeeding and sufficient nutrition are critical for reducing mortality and improving health and developmental outcomes. The WHO global strategy for infant and young child nutrition (IYCN) recommends breastfeeding from birth to benefit from colostrum, continued exclusively for 6 months, then breastfeeding plus energy rich, complementary feeding with nutrient dense, locally available foods containing micronutrients for at least 2 years. We explored local practices, identifying barriers and facilitators to optimal breastfeeding and complementary feeding in Mali, and the influence of traditional beliefs.

METHODS

We conducted qualitative, semi-structured focus groups (FGs) in 4 urban and 3 rural areas in Mali. Separate FGs were conducted in each community with mothers, grandmothers, fathers and elders (4 groups per community) who had children or grandchildren aged 6–24 months. Data were recorded, transcribed, translated and analysed thematically.

RESULTS

Administration of colostrum was considered important; however, the practice of exclusive breastfeeding was variable. The practices of giving water, juices, and medications including herbal remedies to children under six months were common. Participants varied in when they introduced complementary foods and stopped breastfeeding. Underlying determinants influencing participants' decisions were the need to return to work, cost, availability and convenience of complementary foods, as well as traditional beliefs e.g., eggs causing malaria. There were mixed messages regarding sugary or sweet foods. Participants described practices they had discontinued in response to healthcare advice, including mixing dates in hot water for infants less than six months old.

CONCLUSIONS

Health education has positively influenced breastfeeding and complementary feeding practices. However, challenges still remain e.g. financial barriers, the need to return to work/ school, excess sugar intake and taboos inhibiting consumption of protein rich foods like eggs. Health campaigns should: 1. Encourage locally available low-cost, nutrient rich, complementary feeding from 6 months 2. Support mothers and communities to discuss ways of overcoming local beliefs acting as barriers to IYCN. 3. Emphasise the importance of family support from all to facilitate mothers' breastfeeding and prioritise diverse, frequent, small, hygienically prepared meals for IYC. 4. Promote longer, paid maternity leave, part-time work arrangements, on-site crèches, and breastfeeding friendly workplace policies.

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SOAP21_04

FOUR-DAY DIARIES ADAPTED TO PRIMARY SCHOOL CHILDREN TO ASSESS USUAL BEVERAGE INTAKE

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BACKGROUND AND OBJECTIVES

Belgian children are particularly exposed to the consumption of sweetened beverages (SB). Evaluating nutritional health initiatives requires a reliable estimate of beverage consumption in youth. The DRINK trial has been set up to investigate the effectiveness of two-year interventions aimed at reducing the consumption of SB and increasing the consumption of tap water among primary school children. At baseline, our aim was to describe the usual daily beverage intake according to individual characteristics among 8-to-11-year-old pupils.

METHODS

Forty-six primary schools participated in the baseline data collection in 2021. Children completed an age-appropriate 4-day diary to record beverage consumption and a questionnaire on socio-demographic characteristics and propensity to consume water and SB. Their parents completed a complementary questionnaire. Usual daily beverage intakes were estimated by correcting for within-person variation using the Statistical Program to Assess Dietary Exposure (SPADE v. 4.1.24). Differences in intake by subgroup were considered statistically significant if the bootstrapped 95% CIs did not overlap. Over-reporters (8%) were excluded based on the mean +2 SD of total water (i.e. > 2,060 ml/day) and total beverages (i.e. > 2,366 ml/day).

RESULTS

Of the 3,631 pupils included, 2,013 returned a valid diary, child questionnaire, and parent questionnaire. Children usually consumed 1,109 ml/day (95% CI: 1,092-1,132) of total beverages, including 677 ml/day (660-699) of water, 345 ml/day (331-359) of SB, and 60 ml/day (56-64) of unsweetened milk. A higher parental education level was associated with a higher usual intake of total beverages (secondary or lower level: 1,072 ml/day (1,034-1,111) *vs*. post-secondary long: 1,154 ml/day (1,119-1,199)), water (591 ml/day (556-622) *vs*. 774 ml/day (736-818)) and unsweetened milk (54 ml/day (47-60) *vs*. 73 ml/day (63-81)), and with a lower usual SB intake (404 ml/day (374-434) *vs*. 279 ml/day (253-300)). Other socio-economic disparities were observed, most notably for water intake.

CONCLUSIONS

Our estimates, consistent with previous observations, support the reliability of the 4-day diary for assessing usual beverage intake in children, and strengthen the future generalizability of the trial findings. The overall high consumption of SB and socio-economic disparities, especially in water consumption, emphasize the need to reinforce nutritional interventions among disadvantaged children.

CONFLICTS OF INTERESTS
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SOAP21_06

WHAT DOES ‘GOOD COOKING’ MEAN TO YOU? A PHOTOVOICE STUDY OF GHANAIAN WOMEN LIVING IN GHANA AND THE UK

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BACKGROUND AND OBJECTIVES

Cooking practices may be strongly associated with improved dietary outcomes. Cooking is deeply rooted in culture and tradition and influenced by the food environment. However, the nuanced perceptions of ‘good’ cooking are not yet fully understood. This study explored perceptions of ‘good’ cooking practices and compared the drivers of these practices among Ghanaian women living in the UK and their compatriots in Ghana.

METHODS

Data were collected through participatory photography involving Ghanaian women living in Greater Manchester, UK (n=31) and Accra, Ghana (n=30). Participants documented their cooking experiences on one or more cooking occasions, capturing elements such as ingredients, tools, places, activities, cooked dishes. They responded to prompts exploring what ‘good cooking’ means and factors that make it easier or harder. Photographs served as prompts in follow-up interviews to allow participants to narrate the ‘stories’ of their cooking. Inductive thematic analysis of interview data and photographs was conducted using NVIVO.

RESULTS

Five themes emerged, capturing perceptions of 'good' cooking: traditional practices, health and nutrition, love and care, authenticity and heritage, and nostalgia. Participants in both settings viewed traditional cooking as distinct, highlighting preparation from scratch, the use of locally sourced ingredients, and specialised tools, despite its time and energy demands. In Greater Manchester, authenticity and heritage were particularly significant. Drivers of "good" cooking were influenced by individual (e.g., time constraints), physical (e.g., kitchen space), social (e.g., family preferences), and macro-level (e.g., seasonality) factors. In Ghana, clean water, sanitation, and hygiene (WASH) were critical, with food adulteration/contamination concerns shared across both locations.

CONCLUSIONS

For Ghanaian women, cooking has a range of dimensions, and perceptions of ‘good’ cooking were linked to health but also had social and emotional associations. Additionally in Ghana, WASH needs urgent attention by policy makers to facilitate healthy cooking. There is the need for nutrition interventions to emphasise social, cultural, and emotional connotations of ‘good’ cooking in addition to the usual emphasis on physical health, for recommendations to resonate with women’s realities.

CONFLICTS OF INTERESTS

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SOAP21_07

DIETARY DIVERSITY AND ITS ASSOCIATION WITH CHANGES IN ANTHROPOMETRIC INDICES OF COMMUNITY-DWELLING OLDER ADULTS IN TEHRAN, IRAN: A LONGITUDINAL STUDY (2017-2021)

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BACKGROUND AND OBJECTIVES

Dietary diversity refers to the consumption of a variety of foods or food groups over a given reference period, which is crucial for improving nutrition and overall health. This longitudinal study aimed to investigate the association between dietary diversity and anthropometric indices in community-dwelling older adults living in Tehran city in 2017 and 2021.

METHODS

The current study was conducted on 368 older adults [204 (55.4%) women and 164 (44.6%) men] over 60 years of age living in Tehran, who were selected by a systematic cluster sampling method at two-time points, 2017 and 2021. Anthropometric measures (weight, height, hip circumference, and waist circumference) were assessed with standard methods. The participants' dietary intake was assessed by completing two non-consecutive 24-hour recalls, and the dietary diversity score (DDS) was calculated based on Kant's method. Statistical analysis was performed using R software by the mixed effect model method.

RESULTS

The mean age was 67.06±5.52 and 70.89±6.48 years in 2017 and 2021, respectively. Moreover, the mean DDS of the elderly in 2017 (5.07±1.20) was higher than that in 2021 (4.94±1.09) ($p<0.05$). DDS and dairy diversity score decreased significantly over time. After adjusting for confounders, there was an inverse relationship between the DDS and BMI (Body Mass Index) (SE=0.09; B= -0.22), but the interaction effect of year × DDS (SE= 0.10; B = 0.19) was not significant (p=0.06). However, there was a positive relationship between the DDS and ABSI (A Body Shape Index) (p= 0.022; B= 0.00). After adjusting for confounders, this relationship was no longer significant. Additionally, the interaction effect of year and DDS on the ABSI was not significant.

CONCLUSIONS

The dietary intake and dietary diversity of elderly residents of Tehran declined dramatically with age, and a higher DDS was associated with improved anthropometric indices. DDS had an inverse relationship with general obesity in the studied participants, and the passage of time did not affect this relationship. The DDS can be used as a predictive index and is a powerful tool for investigating changes in nutritional status in longitudinal studies of old age. However, longer-duration studies are needed to obtain more conclusive RESULTS.

CONFLICTS OF INTERESTS

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SOAP21_08

TRUST IN THE GOVERNMENT AND FOOD INDUSTRY AS WELL AS CLEAR AND TRANSPARENT COMMUNICATION ON FOOD PRODUCTS COULD HELP CONSUMERS IN MAKING HEALTHY FOOD CHOICES IN THE SUPERMARKET

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BACKGROUND AND OBJECTIVES

Consumption of unhealthy food plays an important role in the increasing prevalence of overweight and obesity. Around 80% of products in Dutch supermarkets do not comply to Dutch Food-Based Dietary Guidelines. In addition, consumers are faced with a lot of product information in supermarkets which can make healthy food choices difficult. The aim of this study is to investigate which (sources of) information Dutch consumers use when making healthy food choices in the supermarket, and whether the use of and trust in information depends on specific consumer characteristics.

METHODS

A mixed METHODSapproach combined a survey (n=395) to quantify patterns and trends in consumer behaviour and semi-structured in-depth interviews (n=8) to obtain detailed insights into the decision-making processes among Dutch consumers aged 16-75 years.

RESULTS

Participants indicated to make most use of the ingredient list (67.6%), nutrition table (67.1%), Nutri-Score (39.0%), certification logo's (31.1%) and nutrition claims (24.1%) for choosing healthy products. When participants had to choose between identical products with different front-of-pack information (Nutri-Score, nutrition claims and organic logo) the Nutri-Score emerged as the most influential factor. Respondents with a positive attitude towards the Nutri-Score were more likely to choose a product with Nutri-Score A ($p<0.05$), whereas a product with organic logo was selected by those who have a more negative attitude towards the Nutri-Score, have a lower trust in the government or food industry and are relatively older ($p<0.05$). Attitude towards the Nutri-Score was more positive among consumers with a background in nutrition ($p=0.001$) and those with a higher trust in the government ($p=0.001$) and the food industry ($p=0.010$). The interviews revealed that available product information is currently inadequate, leading to confusion, skepticism and a desire for more transparent and clear information.

CONCLUSIONS

Consumers should be better informed about how to use product information to make healthy food choices. Especially consumers with a distrust in the government and food industry might benefit from transparent information from a trustful source to effectively use the provided nutritional information. It is recommended to confirm the observed RESULTS by studying effects on actual food purchases in supermarkets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP21_09

EFFECT OF NUTRIENT SUPPLEMENTATION IN PREGNANCY AND AFTER BIRTH ON ANTHROPOMETRIC STATUS AND THE DEVELOPMENTAL DELAY OF THE INFANTS: A COHORT STUDY IN TEHRAN CITY

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BACKGROUND AND OBJECTIVES

Maternal dietary intake during pregnancy plays an important role in fetal development and birth outcomes (1-2). The aim of the present study was to determine maternal dietary diversity and Nutritional adequacy in relation with anthropometric measurements of newborn at birth as a cohort study in Tehran city.

METHODS

This prospective cohort study, was conducted by participation of 585 pregnant women referred to public health centers and hospitals selected by systematic cluster sampling from all geographical zones of Tehran City. Pre-pregnancy nutrient supplement intake [NSI] was assessed by a questionnaire in mothers` first visit, and NSI was followed in each monthly appointment recorded in the health records (the Sib electrical system). Neonatal anthropometric indices and the NSI were also collected from neonates' health records in the Sib electrical system. Developmental delay at 12th month of life was assessed by validated Persian second version of Ages and Stages Questionnaire (ASQII). The ASQII consisted of 5 domains. To explore the relation of NSI and the chance of developmental delay and anthropometric status, binary logistic analysis and linear regression analysis, respectively. Infants' anthropometric data was inputted in AnthroPlus software (version 1.0.4) for calculating weight for age z-score (WAZ), Height for age z-score (HAZ) and body mass index (BMI) for age z-score (BAZ).

RESULTS

Mean ± standard deviation of BAZ at birth of infants was-0.61±1.48. The prevalence of DD in the studied infants was 9.6%. Maternal Iron supplement intake during pregnancy was directly associated with HCZ at birth and 12thmonth. Folate supplement intake during pregnancy was only directly associated with HCZ at birth ($p<0.05$). NSI during pregnancy was not associated with the possibility of DD. However, Iron supplement intake of infants was associated with lower possibility of DD at 12thmonth of life (OR=0.73, 95% CI: 0.41-0.94).

CONCLUSIONS

The findings emphasized that NSI in pregnancy and in the first year of life positively associated with infant`s developmental progress.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP21_10

PATTERNS AND DETERMINANTS OF POSTNATAL WEIGHT RETENTION AMONG WOMEN IN GHANA, KENYA, INDIA, PAKISTAN, AND ZAMBIA

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BACKGROUND AND OBJECTIVES

High postnatal weight retention (PNWR), is a growing public health concern exacerbated by rapid urbanization and socioeconomic factors. Globally, 25-30% of women retain excessive weight post-delivery, with rates reaching 40-60% in LMICs. Despite its severe health and economic impacts, research on PNWR in LMICs remains limited; thus, we analyzed multi-site cohort data to evaluate the patterns and risk factors of PNWR in five LMICs.

METHODS

We analyzed PNWR data, defined as difference between maternal postpartum and pre-pregnancy weight, from the ongoing Pregnancy Risk, Infant Surveillance, and Measurement Alliance (PRISMA) open cohort study in Ghana, India, Kenya, Pakistan, and Zambia. Pre-pregnancy weight was measured at or before nine weeks of gestation or imputed using measures between 10 and 20 weeks. Maternal weight was then measured during pregnancy (at 20, 28, 32, and 36 weeks) and postpartum (6 weeks and 6 months). Descriptive analyses were conducted to evaluate patterns of PNWR as a continuous variable across sites. A two-stage meta-analysis was conducted to identify pooled determinants and risk factors of high weight retention, defined as PNWR >5 kg over the first six months postpartum.

RESULTS

Among 3,281 participants, women retained an average of 1.1 kg at six weeks and 1.0 kg at six months postpartum, with variability across sites. India and Ghana sites reported highest PNWR, with a mean of 1.8 kg and 1.9 kg at six months, respectively. The Zambia site reported both the highest prevalence of overweight and obesity prepregnancy and the lowest PNWR (-0.2kg at 6 months). Excessive gestational weight gain (GWG) strongly predicted higher PNWR (RR: 2.10, 95% CI: 1.33–3.31), while inadequate GWG predicted lower PNWR (RR: 0.63, 95% CI: 0.53-0.75). Each unit of total GWG increased weight retention by 12% (RR: 1.12, 95% CI: 1.07–1.17). The meta-analysis model revealed moderate heterogeneity (I^2 = 61.4%, p<0.001), indicating variation in effect sizes across sites.

CONCLUSIONS

Balanced weight gain during and after pregnancy is essential for maternal health, as both excessive GWG with high postpartum retention and inadequate GWG with postpartum loss pose risks. Findings underscore the importance of this balance for optimizing health outcomes. Site-specific variability in weight retention across BMI groups and differences in effect sizes highlight the need for tailored interventions that account for local sociocultural and nutritional factors. These RESULTS further emphasize the need to address contextual differences to optimize maternal weight trajectories and reduce long-term health risks.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP21_11

THE NUTRITION-SENSITIVE FOOD ENVIRONMENT INDEX: A COMPREHENSIVE APPROACH TO ASSESSING FOOD ENVIRONMENTS IN ASSOCIATION WITH HEALTH RISKS FOR POLICY DECISION-MAKING

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BACKGROUND AND OBJECTIVES

Food environment (FE) is defined as the physical, economic, political and socio-cultural contexts in which people engage with the food system to make their decisions regarding their diet. Existing FE indices often focus on food affordability, overlooking public health aspects. This study introduces a robust, scalable, nutrition-sensitive food-environment index (N-FEI) that quantifies and describes the interplay between food diversity, accessibility, as well as water and sanitation facilities linked to malnutrition risks.

METHODS

Data from 17,294 food vendors collected between 2020 and 2023 in six low- and middle-income countries were used to develop the index based on 9 purposively selected Food Environment (FE) and nutrition-related indicators. The machine learning algorithm XGBoost was used to predict health risks from DHS data, integrated into FE data through geospatial techniques, with interpretations provided by SHAP.

RESULTS

The N-FEI-malnutrition model exhibited high accuracy, indicating that the FE indicators explain e.g. approx. 89.3% (standard R^2) and 87.1% (cross-validated R^2) of the variation in risk for stunting (children), or 93.4% and 94.8% in anemia (women) among population living in the area of the indexed FE. Coupled with low RMSE values (0.028 & 0.030 for stunting, 0.118 & 0.103 for anemia), this underlines the strong correlation between FE and stunting and anemia. The interaction for all predictions showed that, the main interacting pair are 'Vendor availability' and 'Vendor per km^2', suggesting that the combination of overall vendor availability and the density of vendors have a significant synergistic effect on the model's output, particularly in predicting BMI and anaemia-related outcomes. The interaction between 'Vendor availability' and other indicators, such as 'healthy food diversity within a 50m radius' and 'inverted unhealthy food availability', further highlights the critical role of vendor accessibility in shaping health outcomes within the population.

CONCLUSIONS

The N-FEI links poor food diversity, poor hygiene, and poor vendor availability with different malnutrition risks. The result for each indicator can be used (e.g. by policy decision makers) to identify measures to improve the assessed food environment and measure its transformation. In terms of policy implications, the overall RESULTS advocate for interventions that do not merely increase food vendor numbers, but also focus on enhancing the diversity of foods available, especially in areas identified as high-risk.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP21_12

MATERNAL AND HOUSEHOLD-LEVEL DETERMINANTS OF THE GLOBAL DIET QUALITY SCORE DURING PREGNANCY IN INDIA

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BACKGROUND AND OBJECTIVES

Adequate nutrition during pregnancy is critical for the health and nutritional outcomes of mothers and their newborns, but evidence on maternal diets is limited. The Global Diet Quality Score (GDQS) is a new metric to evaluate diet quality of populations in low-and-middle income countries (LMICs). This study aimed to examine GDQS during pregnancy and factors influencing it in rural Uttar Pradesh, India.

METHODS

These data are derived from the Alive & Thrive (A&T) impact evaluation study using a cluster-randomized design, which aimed to strengthen the provision of maternal nutrition interventions focused on behavior change communication within the government antenatal care (ANC) platform in India. We analyzed quantitative multi-pass 24-hour dietary recalls from two cross-sectional surveys, one at baseline (2017) prior to start of intervention and one at the endline (2019). The GDQS was constructed based on the amount (grams/day) of 25 food groups consumed (range 0-49); for 16 healthy food groups higher scores indicated higher consumption (GDQS+) whereas for 9 unhealthy food groups scoring was negative such that lower consumption of unhealthy foods resulted in a higher score (GDQS-). Maternal and household factors influencing GDQS examined in a multivariable linear regression model included age, education, parity, nutrition knowledge, ANC exposure, household size, religion, caste, socio-economic status (SES), and food insecurity, adjusted for pregnancy duration, survey time, and A&T intervention.

RESULTS

The mean (SD) scores at baseline and endline were low at 18.3 (3.4) and 18.7 (3.4) (out of 49) for overall GDQS, 7.1 (3.2) and 7.7 (3.1) (out of 32) for GDQS+ (healthy food consumption), and 11.3 (1.6) and 11.1 (1.7) (out of 17) for GDQS- (low consumption of unhealthy foods). In the multivariable model, 4+ ANC visits (β=0.83 and β=0.78), nutrition knowledge (β=0.12 and β=0.13), and SES (β=0.82 and β=0.96) were positively associated ($p<0.05$) with both overall GDQS and GDQS+, respectively. Maternal education (β=0.66) and caste (β= -0.66) were also significantly associated with GDQS+.

CONCLUSIONS

This study highlights poor diet quality during pregnancy in this context, characterized by low consumption of healthy and unhealthy food groups. The findings emphasize that significant inequities persist in accessing a healthy diet in rural LMIC contexts and identifies vulnerable sub-groups based on SES, knowledge, education, and ANC exposure. Future research is recommended to validate the GDQS among pregnant women across diverse settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP21_13

STUDY ON NUTRITIONAL COGNITION, ATTITUDES AND DIETARY BEHAVIOR OF MIDDLE-AGED AND ELDERLY PEOPLE TOWARDS SARCOPENIA AT THE METABOLISM OUTPATIENT DEPARTMENT OF A REGIONAL HOSPITAL

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BACKGROUND AND OBJECTIVES

The prevalence of sarcopenia is increasingly rising. Traditionally viewed as a common symptom among the elderly, sarcopenia has shown a trend of affecting younger individuals in recent years. Besides age, nutrition and chronic diseases such as hypertension, hyperlipidemia, and hyperglycemia have also been important factors frequently discussed in recent studies. This research focuses on the nutritional cognition, nutritional attitudes, and dietary behaviors related to sarcopenia among middle-aged and elderly people over 40 years old with chronic diseases (hypertension, hyperlipidemia, or hyperglycemia).

METHODS

Using the cognitive-attitude-behavior model as the research framework, a structured questionnaire was self-developed for data collection. The questionnaire consisted of four parts: personal background, nutritional cognition of sarcopenia, nutritional attitudes towards sarcopenia, and dietary behaviors. A purposive sampling method was used to select patients from the outpatient metabolic department. A total of 140 valid questionnaires were collected, and the data were analyzed using descriptive statistics, independent samples T-test, one-way ANOVA, Spearman rank correlation analysis, multiple regression analysis, and logistic regression analysis.

RESULTS

Among the personal background variables, age, education level, physical activity level, grip strength, and limb skeletal muscle mass are significantly correlated with nutritional cognition related to sarcopenia; age, education level, the number of chronic diseases, and grip strength are significantly correlated with nutritional attitudes towards sarcopenia; family income and expenditure status, the number of chronic diseases, and physical activity level are significantly correlated with dietary behavior. Grip strength, calf circumference, and limb skeletal muscle mass all show a significant positive correlation. Nutritional cognition related to sarcopenia is significantly positively correlated with nutritional attitudes towards sarcopenia, and nutritional attitudes towards sarcopenia are significantly positively correlated with dietary behavior.

CONCLUSIONS

"Education level" is the main predictive variable for nutritional cognition related to sarcopenia, with the greatest explanatory power; "the number of three chronic diseases" is the main predictive variable for nutritional attitudes and dietary behavior, with the greatest explanatory power. "Physical activity level" and "calf circumference" can effectively predict the occurrence of sarcopenia.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 23 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP23_01

NATIONAL DIET AND NUTRITION SURVEY (NDNS): INFORMING PROGRESS TOWARDS DIETARY GOALS IN THE UK

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BACKGROUND AND OBJECTIVES
The NDNS was set up in 2008 as a cross-sectional survey with a continuous programme of fieldwork. It provides the only source of nationally representative data on the diet and nutritional status of the UK population aged ≥ 1.5 years. RESULTS are published for foods, nutrients and biomarkers by age and gender sub-groups and are used to monitor progress towards the nutrition objectives of UK Health Departments and develop policy interventions. The most recent RESULTS are for 2019 to 2023 and include comparison of intakes and nutritional status by income and other indicators of deprivation.
METHODS

Data collection was carried out between October 2019 and July 2023 apart from a full suspension of fieldwork between March and October 2020 due to the COVID-19 global pandemic. There were four waves of fieldwork, each aimed to collect data from a UK representative core sample of 500 adults (aged ≥ 19 years) and 500 children (aged 1.5 to 18 years). Participants were interviewed in their home (or over the telephone during COVID-19 restrictions) and asked to self-complete four 24-hour dietary recalls on non-consecutive days using the online tool Intake24 (https://intake24.org/). Telephone assistance was available to those who could not complete independently or who had internet/technical issues. A doubly labelled water (DLW) sub-study for assessment of misreporting by measurement of Total Energy Expenditure (TEE) took place between 2020 and 2022. NDNS is one of the few national large-scale population nutrition surveys to regularly include a DLW assessment.

RESULTS
A total of 4,089 individuals completed at least one dietary recall: 2,146 adults and 1,943 children. The majority of these participants went on to complete all four dietary recalls (3,107, 76%). Drawing on the latest RESULTS (publication due spring 2025), we will present the state of the UK nation in relation to consumption of foods such as fruit and vegetables and intakes of energy, fats, sugar and fibre by age and socioeconomic indicators.
CONCLUSIONS

The UK NDNS is a valuable resource providing ongoing assessment on progress towards public health nutrition objectives.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP23_03

SHORT- AND MEDIUM-TERM IMPACT OF AN IN-COMPANY INTERVENTION ON PLANT-BASED FOOD CONSUMPTION AT HOME AND ON REPRESENTATIONS OF VEGETARIAN MEALS

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BACKGROUND AND OBJECTIVES

The study is aimed at measuring the impact of an intervention delivered in the workplace on consumption of plant-based foods at home and on the way vegetarian meals are perceived.

METHODS

The study involved 77 adults divided into a Control group (n=25) and an Intervention group (n=42). The intervention lasted 6 weeks and consisted of two informational and motivational sessions in the workplace, a culinary workshop by videoconference from home and a team challenge to stimulate the implementation of practices at home. The control group did not benefit from any action. The frequency of consumption of vegetables, pulses and vegetarian meals, and perceptions of vegetarian dishes (source of pleasure, easy to digest, easy to prepare, economical'), were assessed by a self-administered questionnaire before (T0), then 1 month (T1) and 3 months (T2) after the intervention, by both groups.

RESULTS

At T0, an ANOVA between the control and intervention groups enabled us to consider them comparable because the consumption of plant-based foods and perceptions associated with vegetarian meals were not significantly different. For the Control group, no significant changes were observed in terms of consumption of vegetables, pulses, or vegetarian dishes nor in terms of perceptions associated with vegetarian meals between T0, T1 and T2. For the Intervention group, there was a significant increase in the consumption of pulses (T0= 5.2 ± 5.1; T1= 8.5 ± 5.3; T2= 9.9 ± 6.7 pulses per month, $p<0.0001$) and vegetarian meals (T0= 14.9 ± 9.6; T1= 18.8 ± 10.2; T2= 20.2 ± 10.5 vegetarian meals per month, $p<0.001$) was observed between each time point. The frequency of vegetable consumption, already high, remained stable (T0= 29.7 ± 11.6; T1= 30.8 ± 11.8; T2= 31.3 ± 9.6 vegetables per month, $p=0.61$). Perceptions associated with vegetarian meals also changed positively between T0 and T1 and remained stable between T1 and T2 (Vegetarian meals are 'a source of pleasure' (T0= 4.0 ± 0.8; T1= 4.3 ± 0.6; T2= 4.4 ± 0.5, $p=0.001$), economical (T0= 3.8 ± 0.8; T1= 4.2 ± 0.7; T2= 4,3 ± 0,7, $p<0,0001$), 'pleasant in the home' (T0= 2,8 ± 1,0; T1= 3,5 ± 0,9; T2= 3,5 ± 0,9, $p<0,0001$), 'easy to digest'(T0= 4,0 ± 0,7; T1= 4.3 ± 0.6; T2= 4.3 ± 0.5, $p=0.023$), 'easy to prepare'(T0= 2.9 ±1.0; T1= 3.8 ± 0.8; T2= 4.1 ± 0.8, $p<0.0001$)).

CONCLUSIONS

We conclude that for voluntary employees, a free, workplace-based programme combining knowledge, motivational strategies and culinary support helps them to make the transition to a flexitarian diet at home for at least 3 months after the programme.

CONFLICTS OF INTERESTS

Authors are Bonduelle employees

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SOAP23_05

PREVALENCE OF LOW BLOOD AMINO ACID CONCENTRATION OF STUNTED NON WASTED CHILDREN

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BACKGROUND AND OBJECTIVES

The re-emerging concern on amino acids that plays a role for mammalian target of rapamycin (mTor) signalling pathways was triggered by the fact that protein intake is considerably adequate but globally, the prevalence of stunting is remained high. However, limited studies on the blood amino acid were found.

METHODS

A comparative cross-sectional study aimed to compare blood amino acid between stunted non-wasted (SNW) and non-stunted non-wasted (NSNW) children aged 12-23 months living in an agricultural area. Capillary blood was drawn from 151 children and drops onto filter paper (Whatman 903) as dried blood spots (DBs) for 2-3 drops. Analysis of amino acid using LC-MS/MS was performed with Waters Acquity TQ-S, using MassLynx 4.1 and NeoLynx 4.1 (Waters, Milford, MA, USA). Since no cut-off to define the sufficiency of the amino acid blood level, the value of 25th percentile or -2SD of amino acid level from previous study was used as the cut-off.

RESULTS

The finding showed that the prevalence of low blood amino acid concentration for methionine, arginine and citrulline was high (>60%, >90% and >50%, respectively). In contrast, none of the children in this current study have blood amino acids concentration lower than the cut-off for phenylalanine, aspartic acid, glutamic acid, glycine, tyrosine, proline, and ornithine. Different profile on the prevalence of low blood amino acids concentration when a study from Thailand was used as cut-off. From this comparison, the prevalence of low methionine was only 1%, whereas for arginine and citrulline showed similar pattern with previous comparison. In addition, the low glutamic acid level was 100% in this second comparison. However, no significant different between SNW and NSNW group.

CONCLUSIONS

The RESULTS suggest the careful examination and interpretation of amino acid blood level as this nutrient is the type II nutrient in which in the condition of deficiency the growth will be impaired whilst the concentration in blood was maintained.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP23_08

VITAMIN D AND RISK OF SPORT RELATED INJURIES IN THE SUN PROJECT: A PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES

Vitamin D deficiency has been associated with multiple chronic diseases, including those related with bone health. We analyzed the association between validated predicted serum vitamin D status and the risk of sport-related injuries in a large prospective cohort based on a Mediterranean population.

METHODS

The SUN project is a prospective cohort of Spanish university graduates. A validated 136-item food-frequency questionnaire was used as the dietary assessment tool. Vitamin D serum levels were predicted using a previously validated equation. The association between predicted serum vitamin D and the risk of sport-related injuries was assessed through Cox regression models according to quartiles of predicted vitamin D at baseline, after adjusting for different potential confounders. Sensitivity analyses were performed to assess the robustness of our findings.

RESULTS

We included 19,504 participants. After a follow-up of 235,293 person-years (median follow-up of 12.2 years), 4,088 participants had a sport-related injury. A significant inverse association between predicted serum levels of vitamin D at baseline and the risk of sport-related injury in multivariable-adjusted models was found. Individuals in the highest serum vitamin D quartile showed 12% relatively lower risk of having a sport-related injury as compared to the lowest quartile (hazard ratio= 0.88; 95% confidence interval (CI): 0.79-0.99, *p*-trend <0.039). The RESULTS remained significant after performing sensitivity analyses.

CONCLUSIONS

The RESULTS suggested that higher levels of vitamin D at baseline might be associated with a reduced risk of having a sport-related injury.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP23_09

COPING STRATEGIES OF VENEZUELAN MIGRANTS IN COLOMBIA: ADDRESSING FOOD INSECURITY AND CULTURAL RESILIENCE

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BACKGROUND AND OBJECTIVES

Migration profoundly affects all dimensions of human life—health, cultural, social, and economic. Over the past decade, 7.89 million people have emigrated from Venezuela, marking the largest exodus in the region's history. Colombia, a primary destination, hosts over 2.8 million Venezuelan migrants, nearly half facing food insecurity. Migration disrupts access to essential resources such as food, employment, and human security, creating complex challenges for individuals and communities. This study synthesizes three investigations to explore coping strategies employed by Venezuelan migrants in Colombia, emphasizing food insecurity, cultural resilience, and adaptation challenges.

METHODS

Three qualitative studies were synthesized, incorporating semi-structured interviews and sociodemographic data collection. Populations included migrant families, adolescents, and women migrants in Colombia. Data were analyzed using thematic coding and software tools to identify trends in coping mechanisms, culinary practices, and vulnerabilities. All studies received ethical approval from a recognized academic institution in Colombia.

RESULTS

Migrants reported improvements in food availability and physical access but faced barriers to nutritional quality and economic affordability. Culinary traditions fostered resilience and identity preservation despite economic instability. Adolescents and mothers expressed pride in sharing traditional meals but noted that job precarity limited food adequacy and cultural continuity. Women migrants, predominantly young (48% aged 20–30) and single (84%), struggled with informal employment (76%) and low education levels (74%). Households, typically medium-sized (54% led by single mothers), faced food insecurity, with 94% affected, including 84% severely. Health access was constrained despite 74% insurance coverage. Risks included crime (60.5%), discrimination (23.7%), and poor housing conditions (98% rented, 12% without sanitation). Migration facilitated culinary tradition preservation, enabling resilience despite significant socioeconomic challenges.

CONCLUSIONS

Venezuelan migrants in Colombia face vulnerabilities in food security, employment, and access to education and health. Coping strategies like culinary resilience aid adaptation and cultural identity preservation. Policies must address systemic barriers to enhance food security, legal protections, and socioeconomic inclusion while supporting cultural integration.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP23_10

INTRODUCING A NEW MATERNAL MICRONUTRIENT SUPPLEMENT INTO THE ANTENATAL CARE PLATFORM IN PAKISTAN: INSIGHTS BASED ON PREGNANT WOMEN AND HEALTHCARE PROVIDER EXPERIENCE WITH MULTIPLE MICRONUTRIENT SUPPLEMENTS

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BACKGROUND AND OBJECTIVES

Many LMICs are transitioning from Iron and Folic Acid (IFA) to Multiple Micronutrient Supplements (MMS) as the new standard of care for preventive maternal supplementation. Following the WHO context-specific recommendation, and the Government of Pakistan's (GoP) commitment to scale MMS, a multi-year implementation research (IR) project was conducted to better understand implementation realities of introducing a new intervention through the antenatal care (ANC) platform in Pakistan (PK). As part of the broader IR project, this study explored the perspectives and experiences of healthcare providers (HCPs) and pregnant women (PW) with ANC and MMS in the context of this transition.

METHODS

This descriptive qualitative research took place in Swabi district, Khyber Pakhtunkhwa, PK. In-depth interviews were conducted with government facility and community-based HCPs providing ANC (n=7) and focus group discussions were conducted with PW (n=37) to collect information on perspectives and experiences with MMS. Journey Mapping was also conducted with PW (n=6) to collect information on care-seeking. All interviews were conducted in Urdu or Pashto, digitally recorded, transcribed verbatim, and then translated into English for thematic analysis using Excel.

RESULTS

Several key themes relating to MMS and ANC were identified. Within one pregnancy, women seek care from different HCP across public/private and facility/community settings. Factors influencing care-seeking include reputation of the HCP or facility, availability/accessibility of services, and influence of family members. Acceptability of MMS among PW depends on various factors including ease of access and perceived benefits and side effects of MMS. Facilitators to HCP provision of MMS include proximity of ANC to women's homes and open communication and a trusting relationship with PW. Barriers to MMS provision by HCP include high HCP workload, lack of coordination and communication among different ANC providers, and challenges tracking women throughout pregnancy. Facilitators to PW's MMS adherence include perceived benefits, use of daily reminder techniques, use of strategies to mitigate side effects, and support from HCPs and family. Barriers to MMS adherence include perceived side effects, limited agency to make health-related decisions, and interrupted access.

CONCLUSIONS

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This study provides actionable insights from HCPs and PW in PK to inform the scale of MMS across the public ANC platform. Findings are also being used to inform broader decision-making on the transition to MMS as part of comprehensive maternal nutrition in other LMICs.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP23_11

New guidelines on complementary feeding in France: evolutions of knowledge, acceptability and good practices among parents, and factors associated with knowledge: RESULTS from the French Complementary feeding Survey

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BACKGROUND AND OBJECTIVES

Parental educational practices contribute to the child's acceptance of new foods during the complementary feeding (CoF) period and will have an influence on the child's eating habits in the long term. In 2020, Santé publique France spread the new dietary guidelines for parents of children aged 0-3 years. To disseminate these advices, a communication campaign was launched in September 2021 and rebroadcasted in May 2022.

Aims of this study were to investigate variations of knowledge, acceptability and practices of new guidelines among parents and to identify factors associated with knowledge.

METHODS

This study is based on a cross-sectional repeated web-survey: the CoF Survey. The first measure was in March 2022, and second in October 2023, on 2,750 representative French parents of children 0-3 years who already began CoF, recruited via quota method. To investigate variations the different outcomes as well as factors associated with guidelines' knowledge, multivariate logistic regressions were used.

RESULTS

In 2023, parents know more frequently they have to add fats in the meal of their child, compared to 2022 (67% vs 64%, p=0.01), and were more confident in their knowledge (p=0.007). Parents increased knowledge to introduce all food groups early (40% vs 35%), were more confident on their knowledge (p=0.01), and were more likely to consider this practice as acceptable (63% vs 55%, p<0.0001). Similar trends were observed for the introduction of allergenic foods early, with also higher percentage of parents who have put it into practice (p<0.05 for allergens asked). Mothers were more likely to know the guidelines on trusting the child's appetite, adding fats and introducing allergenic foods, while fathers were more likely to report properly the guideline on early introduction of all food groups (p<0.05). Parents with higher socio professional status were more likely to know they need to add fat or to introduce major allergenic foods (p=0.02 and p=0.0006 respectively). Feeling well informed increase the knowledge to introduce fats and other food groups (p=0.0007 and p=0.002 respectively). Educational level, financial status, being primiparous or having read the brochure on CoF were not associated with guidelines' knowledge.

CONCLUSIONS

The present RESULTS highlighted an increasing trend of the knowledge of the new guidelines on CoF, with higher level of confidence, and higher level of acceptability. Nonetheless, some guidelines appeared less well known, confirming the need for future campaigns targeting people who were less likely to report good level of knowledge.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP23_12

Nutrition-sensitive social protection program coverage: Using mixed METHODSto develop new measures for household surveys

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BACKGROUND AND OBJECTIVES

Nutrition-sensitive social protection (NSSP) programs combine food, monetary or in-kind transfers with health and nutrition interventions. They are a critical intervention to equitably address underlying determinants of malnutrition, but no standard approach to measure NSSP coverage exists. Formative research was conducted to examine how program beneficiaries understand social protection programs and to assess cognitive error in survey questions in Bangladesh and Ethiopia for development of new NSSP coverage measures.

METHODS

Following recommendations from technical consultations held in 2023-2024, a minimum set of survey questions were developed to capture the essential components of NSSP coverage – transfer type, target beneficiary, and linked health and nutrition intervention. In 2024, key informant interviews (KIIs) with program officers (n=27) and women program beneficiaries (n=30) were conducted in two districts in Bangladesh and in Ethiopia to understand what and how NSSP programs operate. Two rounds of cognitive interviews (CIs) were conducted with both women (n=57) and male household heads (n=44) to test the proposed survey questions and to identify cognitive errors. Survey items were revised between CI rounds after rapid debriefs. Thematic analyses were applied to field notes and transcripts from KIIs and CIs using deductive and inductive codes, respectively.

RESULTS

Three transfer types were considered – cash/food/in-kind transfers, targeted to nutritionally vulnerable household members and bundled with health and nutrition interventions. In Ethiopia, KII RESULTS indicated elements that may produce measurement error, e.g., women did not differentiate between NSSP and other programs. In CIs, most cognitive errors stemmed from poor understanding of technical terminology or survey items being too lengthy. In Bangladesh, a single program was referred to by many names. Household heads (typically male) could identify programs that provide free food but not programs that provide subsidized food or in-kind transfers. Both women and household heads readily identified programs that provide cash. Beneficiaries in both countries did not recognize the linkage between transfers and health and nutrition interventions, which is a key component of NSSP programs and critical for measurement.

CONCLUSIONS

We propose an alternative measure of NSSP coverage, involving co-coverage of bundled interventions and targeted transfer receipt, that may be useful for tracking progress of NSSP programs across diverse contexts.

CONFLICTS OF INTERESTS

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SOAP23_13

PROSPECTIVE ASSOCIATIONS BETWEEN SUCRALOSE INTAKE AND METABOLIC OUTCOMES IN CHILEAN CHILDREN

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BACKGROUND AND OBJECTIVES

Sucralose, a non-nutritive sweetener (NNS), has been associated with decreased insulin sensitivity and altered glucose and insulin responses in adults (1-3), yet there is limited data on children (4, 5). This is relevant in Chile, where sucralose is the most consumed NNS, with prevalences ranging between 44.4% to 66.0% (6-8). This study evaluates the association between sucralose intake at age 4 and fasting glucose metabolism and lipid profiles at age 6 in a cohort of Chilean children.

METHODS

We conducted prospective analyses on 618 children from the Food and Environment Chilean Cohort (FECHIC). In 2016, at age 4 years, dietary data were collected with 24-hour diet recalls. All packaged foods and beverages were linked to their nutrition facts panels, which provided data on sucralose content and other nutrients. In 2018, after two years of follow-up, metabolic outcomes (fasting glucose, insulin, HOMA-IR, triglycerides, total cholesterol, LDL, and HDL cholesterol) were measured. The usual intake of sucralose was estimated using the Multiple Source Method. We used linear regression models, adjusted for stabilized inverse probability weights to address lost-to-follow-up and baseline covariables (sex, age, maternal education level, and total sugars intake) to examine the association between sucralose intake and metabolic outcomes. We constructed different models to compare sucralose consumers and non-consumers and to verify the association of the amount of sucralose consumed in mg/day among consumers.

RESULTS

At baseline, 62.1% of the children consumed sucralose, with a mean intake of 24.4 mg/day (SD= 7.2). Adjusted models showed a small but significant association between sucralose consumption and HDL cholesterol levels (b = 1.9 [95% CI 0.1, 3.6]). Further analysis of the quantity of sucralose consumed also showed a positive association with fasting triglyceride levels; for every 10 mg/day increase in sucralose intake, triglycerides increased by 7.5 mg/dL (95% CI 1.2, 13.8). No associations were found with other metabolic outcomes.

CONCLUSIONS

In Chilean preschool children, we found a positive association between sucralose consumption and fasting HDL cholesterol and triglyceride levels, while there were no associations with other metabolic outcomes. Our RESULTS suggest a complex relationship between sucralose intake and lipid profiles in Chilean children, indicating potentially beneficial and adverse associations. These findings highlight the importance of considering the potential net health impact of sucralose consumption over time.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP23_14

CHILD HEALTH PROMOTERS PROGRAM MODEL IN MEXICO

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BACKGROUND AND OBJECTIVES
BACKGROUND AND OBJECTIVES: childhood obesity is a public health challenge that requires a holistic and contextual approach; school health promotion including parents and children have shown promising RESULTS, and children have proven to be agents of change regarding health. The aim of this study was to develop and evaluate a model of child health promoters (CHP) as a community strategy to improve feeding practices, food environment and physical activity in school-age children.
METHODS

Through a community-based participatory research the study developed in three Mexican cities, included 36 elementary schools (18 CHP and 18 reference schools), located in medium, high and very high poverty areas. We measured weight, height, waist circumference, and body fat as well as a 24-hour dietary recall, physical activity, socioeconomic and eating habits questionnaires, and parameters of metabolic syndrome. With the research team as facilitators, CHP developed and implemented healthy eating and physical activity actions during a full school year. Focus groups and interviews were conducted with key stakeholders. Realistic Evaluation Theory guided our analysis and model development.

RESULTS

Nutritional risk analysis showed that children in the CHP program had significantly lower body fat compared to the reference group ($p = .001$), a decrease in total cholesterol, and glucose levels, and higher HDL ($p \leq .041$). The context related to changes or intention to change in prevention variables were the teacher-student and parent-student conjunction of actions, and the families socioeconomic level within the most vulnerable areas.

CONCLUSIONS

School-age children can act as health promoters among their peers, resulting in a better communication channel, compared with a traditional researcher - community approach to health and nutrition promotion.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP23_15

METHODOLOGICAL FRAMEWORK FOR THE CREATION AND CONSOLIDATION OF THE OBSERVATORIO MATERNO INFANTIL: ADVANCING MATERNAL AND CHILD HEALTH MONITORING AND POLICY IN MEXICO

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BACKGROUND AND OBJECTIVES

The Observatorio Materno Infantil (OMI) was created in response to persistent maternal and child health challenges in Mexico, particularly regarding malnutrition and healthcare disparities, which have hindered the achievement of global nutrition targets (1,2). In alignment with the World Health Organization's definition (3) of an observatory, OMI aims to generate evidence that drives healthcare improvements for vulnerable populations. This study focuses on outlining the methodology employed in developing a comprehensive methodological framework for creating and consolidating the Observatorio Materno Infantil (OMI). The framework emphasizes generating evidence-based recommendations aimed at informing policy and improving healthcare delivery.

METHODS

The creation of the OMI involved four key phases: 1) Planning: A needs assessment was conducted to analyze national health data. Stakeholder mapping engaged key actors from government, academia, healthcare, and community organizations to align with national health priorities. 2) Co-creation workshops: Design Thinking(4) workshops were held to develop innovative solutions, with experts in maternal and child health and nutrition, and data science focusing on systematizing health information collection and monitoring. 3) Data collection: Data from national health surveys were integrated into the OMI platform to track health trends across Mexico. 4) Data analysis and visualization: Advanced analytics and tools were used to identify disparities and generate insights to inform policy decisions.

RESULTS

The OMI (https://omi.ibero.mx/en/) has successfully established a comprehensive system for monitoring maternal and child health and nutrition in Mexico. The integration of diverse data sources has provided actionable insights that have influenced public health strategies and policies. The platform’s visual dashboards allow policymakers to easily access and interpret data, fostering informed decision-making. The OMI’s capacity-building efforts have strengthened its impact, including training healthcare professionals and engaging vulnerable communities.

CONCLUSIONS

The OMI has significantly improved maternal and child health monitoring in Mexico, offering a model for similar health observatories in other countries. Despite challenges in data standardization and sustainability, the OMI has helped bridge gaps in service delivery and increased the visibility of key health issues.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP23_16

FLOURISHING AND DIET QUALITY DURING PREGNANCY: A SOCIAL INEQUALITY APPROACH

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BACKGROUND AND OBJECTIVES

Flourishing broadly refers to a state of overall well-being and satisfaction across various life domains, including happiness and life satisfaction, physical and mental health, meaning and purpose, character and virtue and close social relationships. A balanced and nutritious diet can positively influence many of these domains, while a suboptimal flourishing state can also contribute to poor diet quality. During pregnancy, adequate nutrition and maternal flourishing play crucial roles in nurturing both the significant personal transformation and the deepened sense of purpose that define this unique period. Adverse social circumstances can impede both nutrition and flourishing by limiting access to nutritious food, safe living conditions, supportive environments, and healthcare services. This study on social inequality examined the influence of income, education, and social support on diet quality and flourishing, and the relationship between them.

METHODS

This cross-sectional study included 94 pregnant women from diverse socioeconomic, linguistic and cultural backgrounds. Diet quality was assessed with the Healthy Eating Food Index (HEFI) score derived from three 24-hour recalls, and flourishing was measured using the Flourishing Measure Tool from Harvard. Pearson correlation was used to assess the relationship between the HEFI score and the flourishing index and ANOVA tests were conducted to assess differences in HEFI score and flourishing index across psychosocial categories (income, education and social support).

RESULTS

No significant correlation was observed with the HEFI score and the total flourishing index ($r=0.19$, $p=0.07$), however, a significant correlation was observed with the physical and mental health flourishing subdomain ($r=0.30$, $p=0.003$). The HEFI score and the flourishing index both significantly differed between categories of income ($p=0.02$ and $p<0.0001$, respectively), and educational attainment ($p=0,03$ and $p=0.0002$), but did not significantly differ according to social support ($p=0,21$ and $p=0.84$).

CONCLUSIONS

These findings highlight the associations between diet quality and the physical / mental health domain of flourishing among pregnant women and underscore the impact of social inequality early in life. More research is necessary to understand how social determinants of health affect both diet quality and flourishing during pregnancy to inform interventions aimed at supporting pregnant women living in precarious conditions to reduce disparities in health and well-being during the perinatal period.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP23_17

ENERGY INTAKE, NUTRIENT CONTRIBUTION AND SOCIOECONOMIC DETERMINANTS OF ULTRA PROCESSED AND LESS PROCESSED FOODS CONSUMED IN ETHIOPIA: EVIDENCE FROM NATIONAL FOOD CONSUMPTION SURVEY

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BACKGROUND AND OBJECTIVES

NOVA classification is one of frequently used food category into four groups according to processing level. Consistently reported that higher consumption of ultra-processed (UPF) or NOVA 4 foods are associated with poorer diet quality and have epidemiological risk for non-communicable diseases (NCDs). Studies reports on consumption, share of energy and contribution for daily micronutrients of each NOVA foods in Ethiopia are limited. This study aims to determine the level of energy consumed and various micronutrients contributed from each NOVA foods

METHODS

This study used Ethiopian National Food Consumption Survey (NFCS). The survey used a random sampling of the population using a two-stage stratified cluster sampling design. It covered 8254 households, 8254 women of reproductive ages (15-45 years), and 7272 children (6-45 months old). Consumption of UPF and less processed foods were taken as response variables to find any association with explanatory variable in the population. Analysis was conducted in Multilevel mixed-effects GLM (meglm).

RESULTS

The most consumed UPF in children were biscuits, cookies, soft drinks, and semi-solid palm oil; while fresh cow milk, human milk, whole wheat bread, and other ranges of homemade cereals and cereal-based foods as minimally processed foods. In both children and women, the largest dietary energy share was from minimally processed foods: 75%% and 79%, from processed culinary ingredients: 18% and 14%, from processed foods: 1.9% and 3.3%, from UPF: 5.1% and 3.5% respectively. NOVA1 foods took large share of energy, also mainly provided the daily micronutrient and macronutrient requirement of the population compared to all other NOVA foods. But, near 66.0% of WRA and 94% of children did not consume fruits in the last 24 Hr. Higher consumption of UPF was found in wealthier households, urban residence and women with higher education.

CONCLUSIONS

NOVA1 foods were the major provider of daily energy, macronutrients also micronutrients. They were dominantly consumed in rural areas than urban, but the reverse had happened for UPF. However, as part of NOVA1 food groups, consumption of fruits and vegetables were low, which could have contributed much for vitamin C and calcium particularly but also for other essential vitamins and minerals

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 24 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP24_01

A NEEDS ASSESSMENT: FOOD SECURITY, NUTRITION, AND MENTAL HEALTH OF ADOLESCENTS DURING THE COVID-19 PANDEMIC IN INDONESIA

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BACKGROUND AND OBJECTIVES

The COVID-19 pandemic has profoundly impacted food security, nutrition, and mental health worldwide, but research in Indonesia, especially among adolescents, remains scarce. This study examines shifts in food security, nutritional status, and mental health among Indonesian adolescents during and after the pandemic.

METHODS

A needs assessment (Jan–May 2024) built on prior research (2021–2022) involving 576 adolescents in Gunungkidul district, Yogyakarta province, Indonesia. The needs assessment involved 61 stakeholders in eight World Café sessions and Focus Group Discussions (FGDs) to explore perceptions of adolescents' food security, nutrition, and mental health. Additionally, 50 adolescents (26 girls, 24 boys) aged 10–19 years participated in Participatory Learning and Action (PLA) using photovoice (400 photographs) to capture their lived experiences. Data analysis employed Atlas.ti.

RESULTS

Adolescents showed limited awareness of mental health and misconceptions about healthy eating, with diets often lacking nutritional quality. Parents demonstrated inadequate knowledge of nutrition and anaemia prevention, compounded by economic challenges and limited emotional support. Teachers and health workers were underprepared to address these issues, and school health programs faced budget and monitoring constraints. Weak intersectoral coordination and fragmented efforts hindered sustainable solutions for adolescent health.

CONCLUSIONS

Integrated, cross-sectoral efforts are crucial to improving adolescent food security, nutrition, and mental health in Indonesia. Recommendations include establishing cross-sectoral data systems, integrating mental health and nutrition into school curricula, fostering school-community collaborations, and reducing stigma through campaigns and capacity-building initiatives.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP24_03

MIND THE GAP - OPTIMISING DIETS OF OLDER ADULTS TO IMPROVE NUTRIENT INTAKE USING THE SMALLEST FEASIBLE DIETARY CHANGE

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BACKGROUND AND OBJECTIVES

Energy intake and diet quality decrease with age, (Van Dijk et al., 2021) as nutrient requirements rise. Supporting older adults in maintaining healthy dietary patterns as their food consumption declines is paramount. Evidence is needed to inform this cohort of potential dietary gaps that need to be managed. A literature review identified higher nutrient (HNut) dietary recommendations for older adults including current fibre recommendations and proposed higher protein, vitamin B12, calcium, folate, and fluids requirements compared to the current government guidelines (Dorrington et al., 2020). The objective of this study was to determine the smallest divergence to the UK current average diet that would be needed to meet specific nutrient requirements based on i) ‘Eatwell’ the UK’s Food-Based Dietary guidelines and government age*gender specific recommendations (Public Health England, 2016) and ii) HNut (Dorrington et al., 2020).

METHODS

The objective of this study was to analyse the consumption patterns of UK older adults to determine the smallest divergence to their current average diet that would be needed to meet specific nutrient requirements based on i) ‘Eatwell’ (the UK’s Food-Based Dietary guidelines) and government age*gender specific recommendations (Public Health England, 2016) and ii) HNut (Dorrington et al., 2020).

RESULTS

The population comprised men (n=781) and women (1082) over-64 years of age. The HNut diet increased daily fruit and vegetable intake by +175g (men), +241g (women), dairy by +67g (men), +225g (women), beans +14g (men), +18g (women), and for women failed to match observed energy intake (+458kcal). In the Eatwell diet, daily intakes increased for fruit and vegetables by +144g (men), +231 g (women), beans +10g (men), +8.5g (women), and red and processed meat +13.4g (women). There were reductions in red and processed meat by -57g (men), and dairy -139g (women).

CONCLUSIONS

Although this study aimed to minimise the changes required to meet optimised guidelines, in some instances large changes in the diet (e.g. adding two or more portions of fruit and vegetables, minimising red and processed meat (Eatwell diet - men) and halving dairy (Eatwell diet - women) would be required. A main conclusion is that 30g of fibre is not achievable for women consuming 1560kcal daily without large dietary change. Strategies to optimise diet in this population requires further examination.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP24_04

PREVALENCE AND DETERMINANTS OF WASTING, STUNTING, UNDERWEIGHT AND OVERWEIGHT AMONG CHILDREN UNDER 5 YEARS OLD IN MONGOLIA: FINDINGS FROM MONGOLIA'S VI NATIONAL NUTRITION SURVEY, 2023

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BACKGROUND AND OBJECTIVES
Malnutrition among under-five children in low- and middle-income countries is a global health concern. United Nations Sustainable Development goals 2030 and The World Health Organization Global Target 2025 include the reduction of malnutrition especially among children (1,2). In Mongolia, the National Nutrition Survey has been conducted since 1993, generating guidelines for infant feeding since 1997 and most recently enacting Law on Infant and Young Child Feeding in 2017. Our team conducted the VI National Nutrition Survey in 2023 to update previous findings and policies. The survey RESULTS will be launched in January 2025, and the data will be made public. The goal of this study is to estimate the prevalence and identify the determinants of under-five wasting, stunting, underweight and overweight in Mongolia.
METHODS

Cross-sectional study design and cluster sampling method were used. A total of 2786 randomly selected under-five children from all five regions of the country participated in the survey. Descriptive statistics and logistic regression models with univariate and multivariable analysis were implemented.

RESULTS

The prevalence of wasting in this population was 1.5%, stunting was 8.4%, underweight was 1.3% and overweight was 11.3%. While overweight prevalence was higher than most LMICs the prevalence of wasting, stunting and underweight were significantly lower. Low-birth weight (<2500g) increased the risk of stunting (AOR 4.411) and underweight (AOR 7.561), as did mothers' lack of education (primary only AOR 1.920; no education AOR 4.887) respectively. Low income increased the likelihood of stunting (AOR 2.330) and severe food insecurity was implicated in underweight (AOR 2.734) and stunting (AOR 2.331) respectively. Kazakh ethnic children had a higher risk of wasting (AOR 2.803) and stunting (AOR 1.441). Overweight children were more likely to be of male gender (AOR 1.456), and those 0-5 months old were more likely to be overweight compared to children >36 months (AOR 3.672). High birth weight (>4500g) babies were more likely to be overweight (AOR 1.740) compared to normal and low birth weight children.

CONCLUSIONS

Current nutritional interventions should be strengthened in quantity and quality, notably nutrition education for mothers. In-depth studies of the Kazakh ethnic population are vital for designing culturally appropriate interventions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP24_06

PERIODIC REVISIONS OF THE CHOICES INTERNATIONAL 5-LEVEL NUTRIENT PROFILING MODEL

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BACKGROUND AND OBJECTIVES

Poor dietary habits are a major contributor to non-communicable diseases (NCDs), the leading global cause of mortality. To promote healthier eating, nutrition policies such as front-of-pack nutrition labeling (FOPNL) have been implemented worldwide. The Choices Program, including the International Choices criteria, supports these efforts by providing a standardized framework for nutrient profiling. Originally designed for a positive front-of-pack logo, the Choices criteria were expanded in 2021 to a 5-level nutrient profiling model encompassing 23 basic and 10 non-basic food groups (Tognon et al). The criteria address key nutrients including industrially-produced trans-fatty acids, saturated fat, sodium, sugar, fiber and energy.

METHODS

To maintain relevance and scientific rigor, the Choices criteria undergo periodic evaluation and revision by an independent international scientific committee. This paper outlines the development of the 2025 version of the International Choices criteria, addressing challenges identified in the 2021 version. Stakeholders highlighted several issues, including misalignment with international trans-fatty acid guidelines, the absence of criteria for plant-based alternatives to meat, the classification of dairy alternatives as non-basic food group, and the need to consider whole grains, non-nutritive sweeteners (NNS), and micronutrients. Revisions were guided by national and international dietary recommendations, literature reviews, food composition data, and stakeholder input.

RESULTS

While whole grain and micronutrient criteria were reviewed, they were not included in the final framework. NNS were introduced as a disqualifying factor, reducing the product's classification by one level and excluding such foods from positive FOPNL eligibility. Criteria for industrially-produced trans-fatty acids were aligned with international standards, and equivalence criteria for protein and micronutrients were established for plant-based alternatives to meat and dairy. Validation involved comparing the revised criteria with indicator foods from food composition databases.

CONCLUSIONS

The updated 5-level nutrient profiling model serves as an international standard for assessing product healthiness and provides a robust framework to guide nutrition policies globally.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP24_09

THE INFLUENCE OF A MANDATORY VITAMIN D FORTIFICATION POLICY IN DENMARK ON NEONATAL 25(OH)D CONCENTRATIONS

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BACKGROUND AND OBJECTIVES

Vitamin D deficiency is a widespread public health issue, even in industrialized countries. Fortifying commonly consumed foods with vitamin D has been proposed as a strategy to improve vitamin D status at the population level. In Denmark, from the 1930s until June 1, 1985, margarine was mandatorily fortified with a small dose of vitamin D (1.25 µg/100 g). However, this fortification policy was discontinued after that date. This study aimed to evaluate the impact of this low-dose vitamin D fortification policy on neonatal 25-hydroxyvitamin D [25(OH)D] concentrations.

METHODS

In an ecological study design, we compared neonatal 25(OH)D concentrations in the exposed group consisting of individuals born from June 1st 1983 to May 31st 1985 and the unexposed group consisting of individuals born from September 1st 1986 to August 31st 1988. We used cosinor modeling to describe the overall mean concentration and seasonal variation in 25(OH)D before and after the termination of the fortification policy.

RESULTS

Considering seasonal variation, the mean concentration of neonatal 25(OH)D3 was lower among exposed than among unexposed (-2.2 nmol/L; 95%CI: -4.5, 0.2). We observed an overall increase in neonatal 25(OH)D concentration over time.

CONCLUSIONS

Our analyses show that margarine fortification with small-dose vitamin D in Denmark before 1985 did not influence newborns' serum 25(OH)D concentrations. The vitamin D dose added to margarine was too small to prevent seasonal vitamin D deficiency in pregnant women and their offspring.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP24_11

TRANSITIONING FROM IRON-FOLIC ACID TO MULTIPLE MICRONUTRIENT SUPPLEMENTATION: HEALTH SYSTEM PERSPECTIVES IN NEPAL

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BACKGROUND AND OBJECTIVES

The Government of Nepal is exploring the transition from Iron Folic Acid (IFA) to Multiple Micronutrient Supplementation (MMS) to improve maternal and child health outcomes. This study aims to assess the operational feasibility of this transition, focusing on critical health system components, including health provider training requirements, supply chain readiness, and storage challenges. By capturing insights from health facility workers, female community health volunteers, and policy makers, the study seeks to identify actionable strategies that support a successful, sustainable transition to MMS.

METHODS

This qualitative study will be conducted across all seven provinces of Nepal. Data collection METHODSinclude 28 semi-structured focus group discussions with health facility workers, female community health volunteers, and 30 key informant interviews with policymakers and logistics/supply chain specialists. Participatory techniques, such as free-listing, prioritization ranking, and pile sorting, will be employed during data collection. Thematic analysis using NVivo software will identify patterns and themes related to the health system readiness for scaling, operational feasibility, and potential enablers and barriers to successful MMS rollout.

RESULTS

This study's analysis will provide comprehensive and detailed findings on domains of scalability, readiness of the health system infrastructure, and enablers and barriers to Nepal’s transition from IFA to MMS, focusing on training, logistics, and resource allocation. The findings, available in April 2025, will provide crucial insights into the health system’s readiness for this transition to MMS. The findings also aim to inform sustainable policy and programmatic approaches to enhance maternal and child health outcomes in Nepal by engaging key stakeholders throughout the research process.

CONCLUSIONS

These findings will complement learnings from a large-scale randomized controlled trial on MMS adherence and acceptability, a qualitative supply readiness assessment, and other ongoing studies, all supporting evidence-based decision-making to optimize Nepal’s health system readiness for MMS implementation. Together, these studies will offer practical recommendations for addressing challenges and generate evidence to support Nepal’s transition from IFA to MMS across all seven provinces.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP24_12

DIETARY CADMIUM EXPOSURE AND HEALTH RISKS: INSIGHTS FROM A BULGARIAN STUDY

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BACKGROUND AND OBJECTIVES

Cadmium is a metal primarily known for its toxic effects on the kidneys. Beyond renal toxicity, cadmium exposure has been statistically linked to an increased risk of cancers in the lung, endometrium, bladder, and breast. The primary routes of sources of cadmium exposure are food and drinking water, with dietary intake accounting for over 75.8% of the total daily cadmium intake. This study aimed to evaluate dietary cadmium exposure in a young population and assess the associated health risks.

METHODS

Cadmium concentrations in 2979 food samples categorized according to the FoodEx2 system were studied. The food samples were analyzed for cadmium content using an accredited inductively coupled plasma mass spectrometry (ICP-MS) method. Handling Left-Censored Data method was applied for analytical RESULTS below the limit of quantification (LOQ). Dietary consumption data for 60 healthy participants (aged 19–29 years) were collected using the 24-Hour Dietary Recall Method. The consumption data covered 1220 food products. The cadmium exposure levels were expressed as mean, median, and 95th percentile values.

RESULTS

The dietary exposure to cadmium in the studied group ranged from 0.21 μg/kg body weight (bw)/week to 0.38 μg/kg bw/week. The median chronic exposure ranged from 0.2 to 0.32 μg/kg bw/week, and the 95th percentile for high consumers ranged from 0.41 μg/kg bw/week to 0.73 μg/kg bw/week. These values did not exceed the toxicological reference value established by EFSA of 2.5 μg/kg bw/week. Women in the study exhibited higher chronic exposure levels compared to men, suggesting that women might be at greater risk for chronic exposure to cadmium. However, no adverse health effects are expected in the studied group based on the calculated dietary exposure levels.

CONCLUSIONS

The dietary cadmium exposure levels in the study group did not exceed EFSA’s tolerable weekly intake. Women in the study appear to be a potentially higher-risk group for dietary cadmium exposure. Further research is recommended to confirm these findings and explore gender-specific factors contributing to cadmium exposure.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP24_13

ENHANCING MATERNAL AND CHILD HEALTH: A CROSS-NATIONAL ANALYSIS OF NUTRITION SERVICE READINESS IN SUB-SAHARAN AFRICA

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BACKGROUND AND OBJECTIVES

Sub-Saharan Africa is off track in achieving the 2025 World Health Assembly nutrition targets. A robust health system is essential to deliver critical interventions that protect the nutrition of pregnant women and children under five years of age.

This study aimed to examine health and nutrition service readiness, provision, and training in Côte d'Ivoire, the Democratic Republic of Congo, Guinea, Kenya, Mali, Niger, and Nigeria.

METHODS

Two distinct data collection streams were employed: national-level commodity data and health facility data. Interviews were conducted with Ministry of Health officials to gather information on the procurement of nutrition commodities. Health facility data were collected in a survey using a two-stage random cluster design. This integrated approach assessed the availability of essential nutrition commodities, service provision, and training of health personnel.

RESULTS

Findings revealed significant variations in health system readiness and service provision across the seven countries. For pregnant women, the availability of Iron-Folic Acid at health facilities ranged from 73% in Guinea to 98% in Mali, with similar variability in service provision and health worker training. Multiple Micronutrient and calcium supplements showed gaps in availability and provision. For children under five, Oral Rehydration Solution availability ranged from 32% in Côte d'Ivoire to 89% in Niger, with corresponding differences in service provision and training. Newer interventions like Micronutrient Powders and Small-Quantity Lipid-Based Nutrient Supplements showed low service provision.

CONCLUSIONS

This study highlights the need for targeted interventions to address supply chain challenges, enhance health worker training, and ensure consistent service provision.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP24_15

BRIDGING THE GAP BETWEEN POLICY AND PRACTICE: COMMUNITY HEALTH WORKERS' CONTRIBUTIONS TO NUTRITION SERVICES IN SUB-SAHARAN AFRICA

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BACKGROUND AND OBJECTIVES

Community health workers (CHWs) are the backbone of healthcare service provision in Africa, particularly in delivering critical health and nutrition services. Despite their pivotal role, there is limited understanding of the alignment between CHW responsibilities as defined in national policies and the actual nutrition services they provide. This study aimed to compare the nutrition-related responsibilities assigned to CHWs in national policies with the nutrition services CHWs report delivering to women and children in six Sub-Saharan African countries: Guinea, Mali, Niger, Côte d'Ivoire, Democratic Republic of Congo (DRC), and Kenya.

METHODS

Data were collected from a cross-sectional survey conducted with CHWs as part of post-event coverage surveys for Vitamin A supplementation. Structured interviews were conducted with 735 CHWs across the six countries. National community health policies and training manuals were also reviewed to extract CHW responsibilities.

RESULTS

The policy documents revealed notable differences in the CHW scope of responsibilities across the six countries. Training for CHWs was inconsistently documented across countries. Financial compensation for CHWs was mentioned in policy documents from five out of six countries, though the nature and amount of compensation varied significantly. Among the CHWs surveyed, a high percentage (68%-84%) reported receiving financial compensation. Most CHWs provided promotional services but were more likely to dispense preventive and curative commodities for children (e.g., Vitamin A, deworming, oral rehydration solution, and Zinc) than women (iron-folic acid, intermittent preventive treatment for Malaria). Service provision was closely linked to the training received. Discrepancies were noted between policy-defined responsibilities and reported service delivery, particularly in growth monitoring and promotion and management of wasting.

CONCLUSIONS

These findings highlight the critical need for stronger alignment between policy directives and CHW training and service provision. Governments must invest in adequately training and compensating CHWs to effectively deliver lifesaving nutrition services.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 27 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP27_01

ENHANCING THE VISIBILITY AND INTEGRATION OF SUSTAINABILITY IN THE NUTRITION AND DIETETICS EDUCATION PROGRAM

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BACKGROUND AND OBJECTIVES

Integrating sustainability into higher education is essential to equip students with tools they need, to create a more sustainable future. However, its visibility and integration in modern curricula often remain unclear. Indeed, in our Nutrition and Dietetics program, a recent student survey revealed a perceived lack of focus on sustainability. Further analysis indicated that students tended to interpret sustainability narrowly, associating it almost exclusively with environmental and climate-related issues (Planet), while overlooking the other dimensions of the 5P model being People, Prosperity, Partnership and Peace.

METHODS

To address these findings, a multi-faceted approach was adopted. Although, it is the responsibility of every educational program to contribute to SDG4 (Quality of Education) other SDGs can be aligned to professional competences of a specific program. For a Nutrition and Dietetics program these are SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), and SDG 12 (Responsible Consumption and Production). A focus group involving students confirmed that attention is given to these SDGs throughout the curriculum, with continuous alignment to SDG 4. Additionally, interviews with faculty members provided a comprehensive inventory of course modules that integrate sustainability (with focus to SDG2, 3 and 12) in their content and pedagogy.

RESULTS

To enhance visibility, sustainability's role was explicitly highlighted in two ways: by updating the ECTS course descriptions to reflect relevant sustainability themes and by emphasizing its importance during course introductions. Furthermore, sustainability was formally embedded into the program's policy and vision statements, underscoring its critical role in shaping future nutrition and dietetics professionals. In addition, an Impact Team Health Promotion was established to further link SDG 3 and SDG 12 to healthy lifestyle promotion on campus. This team, comprising Nutrition and Dietetics students and faculty members, organizes monthly themed activities that spotlight various aspects of health promotion. This initiative fosters a campus culture that integrates sustainability with practical, health-oriented actions, empowering students to apply these principles in real-world contexts.

CONCLUSIONS

This structured approach not only improves the visibility of sustainability within the curriculum but also broadens students' understanding of its multifaceted nature, fostering a holistic perspective on sustainability that aligns with the United Nations' SDGs.

CONFLICTS OF INTERESTS

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SOAP27_03

COST-EFFICIENCY ANALYSIS OF MULTISECTORAL INTERVENTIONS TO PREVENT STUNTING IN ANGOLA: LESSONS LEARNT FROM THE MUCCUA TRIAL

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BACKGROUND AND OBJECTIVES

In order to progress in stunting reduction, it is essential to expand the limited existing evidence on the costs and benefits of multisectoral interventions to prevent it. Assessing cost-efficiency is crucial for optimizing resources and minimizing expenditures to achieve desired outcomes. Stunting remains a significant problem in Southern Angola, where the Crescer project is implementing the MuCCUA trial-a community-based randomised controlled trial with three intervention arms combining standard of care, nutritional supplementation and cash transfers.

METHODS

We are conducting a cost-efficiency analysis of the interventions nested within the MuCCUA trial using the Strengthening Economic Evaluation for Multisectoral Strategies for Nutrition (SEEMS-Nutrition) framework and a societal perspective. A mixed-METHODSapproach (combining financial and economic costs) is used to measure and allocate costs for program activities and inputs. Financial costs are estimated using the activity-based costing method, using project's accounting records and staff time allocation. The ingredient approach uses costs not included in accounting records and both direct and indirect costs incurred by beneficiaries during program participation. Cost-efficiency of each intervention will be calculated by dividing the total estimated cost of each intervention by the respective number of participants reached.

RESULTS

Several challenges emerged during the analysis, including reconciling diverse data sources, selecting appropriate costing methodologies, and accurately determining the number of beneficiaries for community-based interventions. Triangulating input costs required balancing purchase invoices, which often cover multiple deliveries, against beneficiary distribution lists; while sensitivity around salary disclosures from government and non-project-funded staff complicated data collection. However, early engagement with project staff and key stakeholders enhanced the process, offering critical insights into expenditure rationales.

CONCLUSIONS

While cost-efficiency RESULTS are forthcoming, this study highlights key methodological insights and practical lessons learned. Early integration of economic evaluations during project implementation proved instrumental in addressing challenges and refining cost measurement strategies. Accurate cost and cost-driver analyses will contribute to optimizing interventions aimed at reducing stunting in resource-constrained settings, and to inform policy, programming, and future research efforts in multisectoral nutrition strategies.

CONFLICTS OF INTERESTS

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SOAP27_04

SERUM VITAMIN B12 LEVELS AND DIETARY INTAKE IN YOUNG ADULTS: A STUDY ON VITAMIN B12 STATUS AND ITS ASSOCIATION WITH BODY WEIGHT

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BACKGROUND AND OBJECTIVES

Vitamin B12, or cobalamin, is a vital water-soluble vitamin involved in DNA synthesis, red blood cell production, and brain function. Observational and intervention studies have demonstrated that individuals ranging from underweight to severely obese, often exhibit low levels of vitamin B12. The aim of this study was to evaluate the vitamin B12 status in young adults, examining its dietary intake, biochemical levels, and their association with body weight.

METHODS

The study included 90 healthy subjects aged 23.8±1.8 years (68 women) randomly selected from general practitioners' practices in the Pleven region, Bulgaria. Dietary intake was evaluated using a three-day 24-hour dietary recall method. Serum cobalamin levels were measured with a COBAS c411 immunoassay analyzer. Anthropometric measurements, including body mass index (BMI), were recorded using a Tanita MC-780MA analyzer. Data were analyzed using IBM SPSS Statistics, v. 25.

RESULTS

The average dietary intake of vitamin B12 was 4.06 ± 4.7 μg/day for men, while women had lower intake of 3.14 ± 4.2 μg/day, falling short of the Dietary Reference Values (DRVs) of 4 μg. The mean serum vitamin B12 level across participants was 432.5 ± 136.2 pg/mL, with no significant difference between men and women. Vitamin B12 deficiency (<148 pg/mL) was identified in 2.4% of participants, exclusively women. Suboptimal serum B12 levels were observed in 12% of men and 18% of women. Among women with inadequate vitamin B12 status, 31% were overweight - double the proportion of those with a normal BMI (17%). Additionally, a moderate negative correlation (r = -0.58, p = 0.03) was observed between serum B12 levels below 300 pg/mL and BMI.

CONCLUSIONS

Lower levels of vitamin B12 are associated with overweight in healthy young women.These findings highlight the importance of targeted nutritional interventions to address potential deficiencies and their effects on metabolic health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP27_05

THE NUTRITIONAL QUALITY OF THE FIVE-YEAR INVENTORY OF AN AUSTRALIAN FOOD RELIEF ORGANISATION

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BACKGROUND AND OBJECTIVES

In Australia, although food insecurity is addressed through food relief from organisations such as food banks, there is limited information regarding the nutritional quality of food distributed by this sector. A better understanding is warranted, particularly given that food insecure households, reliant on food relief, face higher risk of suboptimal diets and diet-related diseases. Objective: to examine the complete five-year inventory (2019–2023) of an Australian food relief organisation, encompassing over 50,000 distinct lines (more than 19 million kilograms) using three food classification systems, and comparing the alignment between these tools.

METHODS

A quantitative retrospective analysis of the inventory was conducted, with main measures as mean % of each food group/colour category over time and per supply channel, while Cohen's Kappa was used to assess for alignment, agreement and discordance. For the food classification tools, two were nutrition-based underpinned by dietary guidelines and the third was the NOVA system.

RESULTS

Analysis of the included inventory (just over 17 million kilograms) revealed that the sector, on average, supplied 66% of dietary guidelines recommended foods (most nutritious, healthiest), followed by 17% discretionary items (least healthy), and 13% amber foods (nutritious, less healthy). Supply of dairy foods, animal protein and alternatives was variable and low, whilst, 69% of beverages were sugar-sweetened beverages. Under the NOVA system, the inventory was composed of 34% ultra-processed foods (UPF), which are generally perceived as unhealthy foods but were spread across green (52%), amber (9%) and red (39%) nutrition-based categories, resulting in a confusion matrix analysis, indicating low agreement between nutrition-based tools and NOVA, with high confusion for UPF.

CONCLUSIONS

Continuous inventory monitoring using nutritional metrics will improve understanding of the quality of food provided through food relief, and better inform policy decisions and funding support, enabling food insecurity to be more effectively addressed. The NOVA system may stigmatise some nutrient-rich foods in Western diets and rushed policy decisions could result in unintended consequences for an already resource-strapped sector, and individuals with limited cooking facilities.

CONFLICTS OF INTERESTS

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SOAP27_07

Opportunity cost estimation of participating in three maternal and child interventions in South Angola: RESULTS from the MuCCUA trial

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BACKGROUND AND OBJECTIVES

Stunting is a public health concern in Southern Angola. The MuCCUA trial evaluates the cost-effectiveness of a combination of three interventions to prevent it: standard of care (SOC), nutritional supplementation (NS), and cash transfers (CT) during the first 1000 days. Participation entails an opportunity cost, which should be considered to better understand indirect costs and improve future interventions design. This study aims to estimate the opportunity cost for the women participating in it.

METHODS

The MuCCUA trial is a community-based, cluster randomized controlled trial that recruited pregnant women and conducts periodic follow-up interviews with mother-child pairs until the child reaches two years of age. At twelve months postpartum, data was collected on travel time, waiting time, transportation expenses, and activities foregone due to traveling to and waiting at health posts (SOC) or distribution points (NS and CT). Descriptive analyses were presented median transportation costs and proportions according to transport and waiting time categories as well as to type of activities missed due to their intervention participation.

RESULTS

Of 1,006 women surveyed, all participated in the standard of care (SOC) intervention and some of them received combined interventions: 352 also received nutritional supplementation (NS), and 351 also received cash transfers (CT). Over 50% of women reported spending more than 1 hour traveling to health posts for SOC or to distribution points for NS and CT, with 30% spending over 2 hours. Waiting times were also significant, with 25% of women waiting more than 1 hour at health posts for SOC, and 10% of NS and 32% of CT participants waiting over 1 hour at distribution points. Between 30 and 40% of women reported transportation expenses, with median costs of 1500 AOA ($1.6) for SOC and 2000 AOA ($2.2) for NS and CT. Additionally, around 70% of participants reported ceasing daily activities to participate in the interventions, primarily agricultural work (50%), domestic tasks (30%), and paid work (20%).

CONCLUSIONS

A significant majority of participants reported sacrificing economically valuable activities due to long travel and waiting times, which will be accounted for as indirect costs in the final analysis. Additionally, over one-third incurred transportation expenses, with higher costs linked to trips to distribution points. Incorporating a societal perspective and opportunity costs in economic evaluations is essential to identify unintended participant costs and inform the design of more efficient and accessible interventions.

CONFLICTS OF INTERESTS

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SOAP27_08

Was the increase in breastfeeding initiation and duration in France between 2012 and 2021 observed whatever the level of maternal education? RESULTS from the EPIFANE 2012 and 2021 cohorts

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BACKGROUND AND OBJECTIVES

Since 2001, France has included the promotion and support of breastfeeding as a public health objective in its National Nutrition and Health Programme (PNNS). To guide public policy, the national repeated cohorts EPIFANE, an epidemiological surveillance system of trends in breastfeeding, were set up. We aimed to assess changes in breastfeeding initiation and duration in France between 2012 and 2021, and whether these changes differed according to mothers' level of education.

METHODS

EPIFANE 2012 and 2021 were two prospective cohorts including a nationally representative sample of neonates born after 33 AW in mainland France. in 2012, 3368 neonates from 136 maternity wards randomly selected, were included and interviewed at birth, 1, 4, 8 and 12 months. In 2021, we included 3 543 dyads, drawn at random from women included in the 2021 National Perinatal Survey and who agreed to take part in its 2-month follow-up. Mothers were interviewed at birth, 2 ,6 and 12 months. Kaplan Meier curves were used to determine breastfeeding duration. For maternal education, we distinguished a level of education below high school, high school level, 1 or 2 year after baccalaureate(high school) degree, 3 years or more after baccalaureate Sample designs were taken into account in all statistical analyses and the data were weighted.

RESULTS

In France, in 2012, 74% of mothers initiated breastfeeding versus 77 % in 2021. Median duration of breastfeeding increased of 5 weeks between 2012 and 2021, to 15 from 20 weeks. In 2012 and 2021, maternal education was a determinant of breastfeeding initiation and duration, with higher rates and duration observed among women with an education level equal to 3 years or more after baccalaureate. However, while the proportion of breastfeeding initiation did not change between 2012 and 2021 for women with a baccalaureate +1 or 2 (74%) and women with a baccalaureate +3 or more (83%) it almost increased of five points for women with a high school level (69% vs. 74%) and women with an education level below high school (65% vs. 69%). On the other hand, we observed increases in the median duration of breastfeeding between 2012 and 2021 for all levels of education, with an increase of 47 days for women with an education level below high school, and equal to 30 days for other categories

CONCLUSIONS

Analyses are underway to understand whether these trends, more significant for women with lower level of education, stay the same when maternal place of birth is taken into account.

CONFLICTS OF INTERESTS

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SOAP27_10

ADVANCING MATERNAL NUTRITION: EVALUATING MULTIPLE MICRONUTRIENT SUPPLEMENT ACCEPTABILITY IN SIERRA LEONE'S ANC SERVICES

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BACKGROUND AND OBJECTIVES

There is significant evidence of the benefit of multiple micronutrient supplements (MMS) during pregnancy over iron folic acid (IFA) on maternal and infant health and nutrition. In view of this, the Ministry of Health (MoH) of Sierra Leone decided to switch from IFA to MMS in 2023 with the support of its partners Helen Keller International and CARE International. The MMS is distributed in bottles containing 180 tablets to address the problem of inconsistent supplementation among pregnant women, but the impact this may have on ANC attendance and the general acceptability of the product in Sierra Leone is unclear. To address these implementation questions, a formative study was carried out in three districts where Helen Keller Intl supported the government to transition from IFA.

METHODS

A survey was conducted with 533 women in Kenema, Bombala, and Western Area districts in Sierra Leone. Women were enrolled at ANC and administered a survey questionnaire assessing their perceptions of MMS organoleptic, packaging, ease of use, social and time resources for supplement use and perceived impact on health. Women were also asked about how they valued ANC and their trust of ANC service providers.

RESULTS

The study has four key findings: first, most women who attended ANC reported receiving MMS (88%) and counseling for MMS. Second, women value ANC beyond MMS receipt and did not perceive that a 180-pill ration would limit ANC attendance. This was evidenced by the high trust and value of the counseling offered at ANC. Third, women found the MMS supplement to be acceptable. Women liked the pill size and color, found packaging attractive, and found the product easy to use. Taste, smell and ease of swallow were slightly less accepted. Finally, social support and education can be strengthened. A quarter of women did not feel that their family supported them to take MMS. Though women generally were aware of MMS health benefits to themselves and their babies, some women were unaware of the need to continue taking the supplement even if their diet was adequate and others noted double dosing in case of a missed dose.

CONCLUSIONS

The study found MMS in a 180-pill bottle to be acceptable among women who attend ANC in Sierra Leone. Women trust and value their ANC providers and experience, beyond the receipt of supplements. Future efforts should proceed with the administration of the 180 pill bottle of MMS and invest in strategies to improve knowledge and social dynamics that constrain supplementation.

CONFLICTS OF INTERESTS
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SOAP27_11

Improving Growth and Feeding Practices of Children Under Two (U-2) Years through Animal Source Food, Multiple Micronutrient Powder and Psychosocial Stimulation in a Resource-Poor Setting: Preliminary RESULTS from a Randomized Controlled Trial

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BACKGROUND AND OBJECTIVES

The first two years of life are critical for growth and development. Poor complementary feeding, poor home environments, and high infection rates hinder progress, contributing to stunting and micronutrient deficiencies affecting nearly one-third of children under five in developing countries. Previous interventions implemented in Bangladesh showed that comprehensive intervention improved growth and dietary diversity of children under two (U-2) years. This study explores the impact of combining Animal Source Food (ASF), Multiple Micronutrient Powder (MNP), psychosocial stimulation, and nutrition education (NE) on enhancing growth and feeding practices in U-2 children in low-resource settings.

METHODS

A community-based, cluster-randomized, controlled, three-arm trial was conducted in 30 clusters in Atpara Upazila, Netrokona district, Bangladesh. A total of 627 mother-infant pairs were equally assigned to Group-I, receiving daily eggs, MNP, psychosocial stimulation, and nutrition education (NE); Group-II, receiving eggs, MNP, and NE; and Group-III (Control), receiving NE only. The 12-month intervention was delivered by trained Nutrition Workers. Egg consumption and morbidities were measured monthly, while anthropometric measurements and feeding histories were collected quarterly. Dietary intake was assessed using a 24-hour recall. The primary outcomes included differences in growth and feeding practices among groups, analyzed using linear regression.

RESULTS

Baseline characteristics were similar across the three groups, including child age, gender distribution, parity, breastfeeding rates (94%–97.6%), dietary diversity scores (2.8–2.9), and delivery type (~64% normal). Nutritional status indicators, such as mean length-for-age z-scores (LAZ) and weight-for-age z-scores (WAZ), were comparable. After 12 months, Group -I achieved the highest mean length (81 cm at endline), followed by Group-II (80 cm) and the control group (79 cm). Group-I had a significant effect on length (coefficient: 2.311, 95% CI: 1.53–3.10) compared to Group-II (coefficient: 1.586, 95% CI: 0.81–2.37). For LAZ, Group-I showed a higher effect (coefficient: 0.551, 95% CI: 0.36–0.75) than Group-II (coefficient: 0.375, 95% CI: 0.18–0.57). Dietary diversity scores improved significantly, reaching 89% and 88% in intervention groups, compared to 71% in the control group.

CONCLUSIONS

The study showed that the combined intervention including ASF, MNP and NE significantly improves growth and dietary diversity among children under two.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP27_12

INFLUENCE OF FOOD INSECURITY AND ACCULTURATION ON DIETARY CHANGES AMONG STUDENTS FROM FRENCH OVERSEAS REGIONS AFTER RELOCATION TO MAINLAND FRANCE

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BACKGROUND AND OBJECTIVES

The influence of changes in the food environment on behaviors remains rarely studied. Individuals from French overseas regions (FOR), particularly students, experience profound and sudden changes in their food, socio-cultural and economic environments that can affect their diet when they move to mainland France (MF) to their studies. The aim of this work is to assess associations between dietary changes among students from the FOR after relocating and food insecurity (FI) and acculturation.

METHODS

In 2024, a cross-sectional survey (n=306) was conducted among students born in one of the five FOR and were studying in the MF, using a quota sampling method. An online questionnaire captured food purchasing and consumption practices, including reported dietary changes for 17 food groups. FI was measured using the 6-items US. Household Food Security Survey Module and acculturation by length of residence and age at arrival in MF. Multinomial logistic regression models adjusted on individual-level covariates were used to evaluate associations between dietary changes and FI and acculturation.

RESULTS

More than half of students were food insecure. Students who reported consuming fewer vegetables (OR=2.2, 95% CI: 1.0-4.5), dairy foods (OR=2.6, 95% CI: 1.0-6.5), whole starchy foods (OR=2.7, 95% CI: 1.1-6.2) and more sugary drinks (OR=2.6, 95% CI: 1.3-5.3) since they are in MF were more likely to be food insecure. Those who reported eating more eggs (OR=3.6, 95% CI: 1.9-6.9) and poultry (OR=3.0, 95% CI: 1.5-6.2) after relocation were also more likely to experience FI. The probability of FI was significantly higher among students who consumed less fast-food (OR=2.8, 95% CI: 1.2-6.6) and alcohol. Students who reported changes in their red meat consumption after relocation, either eating more (OR=5.5, 95% CI: 2.1-14.4) or less (OR=3.4, 95% CI: 1.8-6.4) were more likely to be food insecure. Acculturation variables had weak associations with changes in consumption of food groups, except for a higher consumption of eggs and a lower consumption of sugary products.

CONCLUSIONS

Although some changes were converging towards healthier diets, FI also leads to unfavorable modifications. Further research is needed to assess the effect of relocation to MF on food consumption and the influence of acculturation considering additional variables such as cultural proximity to the FOR, as well as exploring the potential interaction between FI and acculturation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP27_14

IMPACT OF SUPPLEMENTATION WITH FORTIFIED BALANCED ENERGY–PROTEIN DURING PREGNANCY ON BIRTH OUTCOMES: A COMMUNITY-BASED RANDOMIZED TRIAL AMONG PREGNANT WOMEN IN SOUTHERN NEPAL

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BACKGROUND AND OBJECTIVES

Undernourished pregnant women are at increased risk of adverse birth outcomes, including small-for-gestational-age (SGA) and preterm birth. The World Health Organization (WHO) recommends balanced energy-protein supplementation (BEP) in pregnancy to reduce risk of stillbirth and SGA birth in undernourished populations, yet variations in supplement composition and format and limited evidence on impact in lactation warrants further study. The Maternal Infant Nutrition Trial (MINT) aimed to assess the impact of a fortified BEP supplement in pregnancy and lactation on birth outcomes and infant growth in rural Nepal.

METHODS

MINT was a 2X2 factorial, unblinded, household randomized efficacy trial. Married women (15–30 years) who became pregnant were randomized to daily fortified BEP (~400 kcal, ~14 g protein, and multiple micronutrients) or no BEP from 14 weeks' gestation to delivery; participants in both arms also received iron-folic acid as standard of care. This analysis presents RESULTS for the primary outcome of the pregnancy period, incidence of SGA among live-born infants, and secondary outcomes, including preterm birth (<37 wks) and low birth weight (<2.5 kg). SGA was defined as infants with birth weight <10th centile of the INTERGROWTH-21st reference by gestational age and sex for those measured <72 hours after delivery. The analysis used an intent-to-treat approach to compare the proportion of SGA infants in intervention vs. control using log-binomial regression to estimate a relative risk and 95% confidence interval. A similar approach was used for secondary outcomes.

RESULTS

The trial enrolled 1,944 pregnant women, randomized as 985 supplement and 959 no supplement, in Sarlahi District, Nepal, from November 2021 to August 2023. Of 1,566 pregnancies with ≥1 live birth, 1,197 singleton infants had data on gestational age at birth and anthropometry within <72 hours of delivery. Trial groups were balanced across participant factors. At baseline, participant mean (SD) age was 24.5 (3.5), 10.8% (n=210) were nulliparous, 40.2% (n=781) had short stature (<150cm), 29.6% (n=576) were underweight (<18.5 kg/m2), and 45.1% (n=876) had no formal education. The incidence of SGA was 40.1% (n=479), preterm birth was 5.1% (n=79/1,550), and low birth weight was 20.1% (n=240). Data on treatment effects will be presented.

CONCLUSIONS

MINT RESULTS will contribute to global efforts to refine and implement the WHO context-specific recommendation for BEP supplementation in pregnancy for undernourished settings across low- and middle-income countries.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP27_15

FOOD BIODIVERSITY AND WEIGHT VARIATION: ASSOCIATIONS IN A FRENCH COHORT

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BACKGROUND AND OBJECTIVES

Food biodiversity, representing the diversity of plant and animal species consumed, may be a key determinant of diet quality, and positively influence the resilience of food production systems. Dietary species richness (DSR), a core marker of food biodiversity, has been positively associated with micronutrient adequacy and inversely associated with mortality and digestive cancer risks. However, the relationship between DSR and weight variation, including the risk of overweight and obesity, has not yet been explored. This study aimed to investigate these associations in a large French cohort.

METHODS

A total of 87,246 participants (78.2% were women, age = 43.8 (±14.7) years old) were included. They reported their weight and height at baseline and every six months. Each participant's DSR (the average number of different species consumed daily) was calculated based on repeated 24-hour dietary records collected during the first two years of follow-up. Proportional hazards Cox models were used to examine the associations between DSR and the risk of developing overweight (among participants with baseline BMI ≤ 25 kg/m²) and obesity (among those with BMI ≤ 30 kg/m²), adjusting for potential confounders and baseline BMI. The relationship between DSR and BMI variation was analyzed using mixed models for repeated measures.

RESULTS

The mean DSR was 32.4 ± 6.7 species per day. Higher DSR was inversely associated with the risk of developing overweight (2009–2023; median = 8 years): hazard ratio (HR) for a 10-species increase = 0.88 (0.85–0.91); $p < 0.001$. Participants in the highest DSR quartile (Q4) had a lower risk of overweight compared to those in the lowest quartile (Q1): HR = 0.81 (0.76–0.86); $p < 0.001$. Similarly, higher DSR was inversely associated with obesity risk: HR for a 10-species increase = 0.85 (0.81–0.90); $p < 0.001$, and HR (Q4 vs. Q1) = 0.76 (0.69–0.83); $p < 0.001$. Mixed models revealed that higher DSR was associated with a decrease in BMI over time ($\beta = -0.00834$; $p < 0.001$). These findings remained robust after additional adjustments for food groups associated with weight gain.

CONCLUSIONS

These RESULTS suggest an association between food biodiversity, measured by the number of different species consumed daily, and a lower risk of weight gain, overweight and obesity. If confirmed by further studies, these associations could help explain previous findings linking food biodiversity to reduced mortality and cancer risks, where overweight is a known risk factor. More research is needed to understand the underlying mechanisms.

CONFLICTS OF INTERESTS

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SOAP 29 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP29_01

MICROPLASTICS IN FOOD AS A POTENTIAL HEALTH RISK: MECHANISMS OF IMPACT AND MITIGATION STRATEGIES

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BACKGROUND AND OBJECTIVES

Owing to the presence of microplastics (MPs) in a variety of food sources such as water, seafood, salt, and packaged products, it has emerged as a major environmental and health threat over the past few years. Though their environmental impact is well studied, their potential effects on human health are uncertain. Here, we report an evaluation of dietary microplastic exposure risks, investigation of their biocompatibility, and elucidation of strategies to attenuate their impact.

METHODS

The investigations performed use spectroscopic and microscopic approaches to analyze microplastic contamination in several dietary foods. MP uptake, oxidative stress, and inflammatory responses are assessed using intestinal epithelial cells (Caco-2) and immune cells (macrophages) under in vitro conditions. Phagocytosis and cellular damage are quantified by flow cytometry and fluorescence imaging.

RESULTS

Initial RESULTS support that MPs are actively taken up by intestinal and immune cells, contributing to oxidative stress and inflammatory signaling. Long-term exposure to MPs can alter gut barrier function, the microbiome, and is thought to be involved in the development of metabolic and inflammatory diseases. Differences in the constituent and size of the MPs can modify their cellular uptake and toxicity.

CONCLUSIONS

MPs in dietary exposure pose a potential health risk by triggering cellular stress and inflammation. In the face of this reality, strict implementing regulations on food contamination, reducing plastic packaging, and using alternative biodegradable materials are vital for risk mitigation. More research is required to understand longitudinal health effects and the best detoxification approaches related to microplastics.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP29_02

FROM THEORY TO ACTION: IMPACT OF A BREASTFEEDING EDUCATION INTERVENTION ON KNOWLEDGE, SKILLS, AND CONSTRUCTS OF THE THEORY OF PLANNED BEHAVIOUR OF MEXICAN NUTRITION STUDENTS

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BACKGROUND AND OBJECTIVES

Breastfeeding (BF) is recognized as a fundamental component of public health (WHO, 2018). However, the lack of adequate training among nutritionists affects its effective promotion of BF (Becker, 2021; Grover, 2022). Innovative educational tools, as Massive Open Online Courses-*MOOC*, are key to closing these gaps and enhance the competencies of professionals in this domain (Sandhi, 2023). The aim of this study is to evaluate the impact of a BF-MOOC on knowledge, skills, and constructs of the Theory of Planned Behaviour about BF in Mexican nutrition students.

METHODS

A quasi-experimental pre/post-intervention study was conducted with nutrition students from three public universities in northern/western Mexico (approved by Ethical Committe). The students were invited by each Nutrition Degree Coordinator. Participants completed five 100-point online questionnaires (*LACTAMEX*) before and after a 40-hour BF-MOOC. Differences in scores (final-first test), were analysed with Student's t-test for related samples, with RESULTS expressed as mean±SD, p-value, size effect (Cohen’s d), and the percentage of subjects who improved in each construct.

RESULTS

Out of 235 participants who took the initial survey, only 64 students returned after four weeks, having completed the course. We excluded the only two men who answered the final survey. The scores obtained improved significantly in knowledge (8.04±15.0, $p<0.05$, d=0.5), attitudes (3.85±9.2, $p=0.002$, d=0.4), beliefs (3.03±9.1, $p=0.013$, d=0.3) and intention to promote BF (9.61±14.7, $p<0.05$, d=0.7). There were no significant differences in skills (1.15±15.3, $p=0.562$, d=0.1). Most of the students improved in knowledge (73.3%), skills (36.7%), attitudes (66.7%), beliefs (53.3%) and intention to promote BF (75%).

CONCLUSIONS

The efficacy of a BF-MOOC for nutrition students has been demonstrated, except for BF skills. This finding underscores the significance of incorporating BF contents into health undergraduate degrees, to which clinical or population-based experiences should be added.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP29_03

ONE NUTRITION COVERAGE SURVEY - LEARNINGS FROM A METHODS-DRIVEN HOUSEHOLD SURVEY TO ESTIMATE CO-COVERAGE AND EQUITY OF MULTI-SECTORAL NUTRITION INTERVENTIONS

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BACKGROUND AND OBJECTIVES

Global efforts to eliminate malnutrition face persistent challenges, and governments in low- and middle-income countries (LMICs) have developed multi-sectoral nutrition policies and strategies to combat these issues. However, measuring coverage of multi-sectoral nutrition interventions remains complex with data gaps that hinder effective policy implementation. The One Nutrition Coverage Survey (ONCS) aims to improve nutrition intervention coverage data by piloting new and standard metrics for assessing individual and household coverage of multi-sectoral interventions, targeted to vulnerable populations.

METHODS

The methods-focused ONCS will be implemented in 4 districts in Bangladesh (N=3280 households) in early 2025 as a proof of concept, using district-representative household survey to collect data on coverage of nutrition interventions aligned with national policies. The survey will test both new and standard measurement tools across sectors, including maternal, infant, and young child nutrition (MIYCN), nutrition-sensitive social protection (NSSP), and large-scale food fortification (LSFF). Coverage and co-coverage estimates will be generated and compared with existing data sources. The survey will also assess equity through disaggregation by residence type (urban vs. rural), education, and vulnerability segmentations based on socio-economic factors.

RESULTS

The ONCS will provide comprehensive coverage data on a wide range of nutrition interventions across health, WASH, agriculture, and social protection sectors. The analysis will estimate both individual and household-level coverage of individual interventions (percentages) and co-coverage of combined interventions for different life stages and across sectors (percentages and mean index values). Socio-demographic factors such as education, wealth quintile, and urban-rural residence will be analyzed to assess equity in intervention reach as well as by multi-dimensional vulnerabilities identified by segmentation of population groups. We will also develop guidance on how these data were collected and analyzed and provide measurement considerations.

CONCLUSIONS

Our findings will contribute to the monitoring and improvement of multi-sectoral nutrition programs in Bangladesh. The ONCS will also contribute to the global nutrition data landscape by refining coverage measurement methodologies and providing actionable insights to guide policy improvements. Learnings from the survey will support evidence-based decision-making in LMICs by addressing the complexities of multi-sectoral intervention measurement.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP29_04

MONITORING CHANGES IN IODINE STATUS IN THE UK

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BACKGROUND AND OBJECTIVES

Dietary iodine is essential for the production of thyroid hormones. Deficiency is associated with impaired neuro-cognitive development. Children and women of childbearing age are at particular risk in relation to the impact of deficiency. Over the past decade, concern has been raised about the possible decline in iodine status in some groups of the UK population due to declining dairy milk intake and changes in farming practices. We present population urinary iodine concentration (UIC) data from the UK National Diet and Nutrition Survey (NDNS).

METHODS

The NDNS is a continuous cross-sectional survey of diet and nutritional status of the UK population aged ≥1.5 y. Since 2013, spot urine specimens have been collected in participants aged ≥4 y. UIC is measured by inductively coupled plasma mass spectrometry (ICP-MS) and compared against WHO population cut-offs.

RESULTS

In the previous NDNS assessment between 2016 and 2019, median UIC was 149 and 135 µg/L in children aged 4 to 10 y (n 525) and 11 to 18 y (n 524) respectively, and in adult women (19 to 64 y) was 104 µg/L (n 688). The average percent change (95% CI) in UIC per year between 2013 and 2019 was -2.1% (-5.3, 1.3), 0.6% (-2.6, 4.0) and -2.6% (-5.3, 2.5) for children aged 4 to 10 y, 11 to 18 y and adult women, respectively. We will present up-to-date estimates of UIC in children and adults from the most recent NDNS assessment between 2019 and 2023 (RESULTS due for publication in Spring 2025) and examine change in UIC over 10 years to 2023.

CONCLUSIONS

NDNS data between 2016 and 2019 indicated evidence of declining iodine status in the UK. Whilst UIC in children was adequate, in adult women median UIC was relatively close to the WHO population threshold of <100 µg/L for mild deficiency. This may have implications for women in the UK and their offspring. These data suggest continued surveillance of at risk population groups is warranted in NDNS to inform on potential future public health programmes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP29_05

EVALUATING THE NUTRITIONAL QUALITY AND LABELLING OF CANADIAN FOOD PRODUCTS FOR INFANTS AND YOUNG CHILDREN USING THE WHO NUTRIENT AND PROMOTION PROFILE MODEL

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BACKGROUND AND OBJECTIVES

Unhealthy foods can contribute to poor dietary habits early in life. However, there has been little research or regulation regarding the nutritional composition and labelling of food products for infants and young children (FIYC) in Canada. Given the WHO's 2022 publication of a nutrient and promotion profile model (NPPM) to guide the appropriate nutritional composition, labelling, and promotion practices of FIYC, the objective was to evaluate Canadian FIYC using the WHO NPPM.

METHODS

Data for 228 toddler foods were extracted from the University of Toronto 2017 pre-packaged food database (Food Label Information and Price) and evaluated using the WHO NPPM. The number and proportion of FIYC that did not meet each nutrient content and labelling, and promotion criteria were evaluated.

RESULTS

None of the Canadian pre-packaged FIYC met all the WHO NPPM standards. Specifically, 71.9% (n=164) failed to meet ≥1 nutrient content and labelling criteria, with 48.3% (n=112) lacking a 'high in sugar' front-of-pack label despite exceeding the sugar thresholds. All FIYC failed to meet the promotion standards with all of them having no proportional content for ingredient list, 94.4% (n=219) displaying ≥1 promotional claims, and 99.1% (n=230) not displaying any content to promote and protect breastfeeding.

CONCLUSIONS

RESULTS suggest that most FIYC in Canada do not meet the nutrient standards and/or labelling of the WHO NPPPM with widespread inappropriate promotion practices. Regulatory action addressing the composition, labelling, and promotion of FIYC are needed to support the nutritional health of infants and young children in Canada.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP29_07

REAL WORLD INTERVENTIONS TO INCREASE DIETARY FIBRE INTAKE IN CHILDREN, ADOLESCENTS AND LOW INCOME CONSUMERS

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BACKGROUND AND OBJECTIVES

Intake of dietary fibre in all age groups fails to meet national recommendations across Europe, despite public health campaigns. People from low SES groups tend to have the lowest fibre intakes and poorest diet quality. They are also most vulnerable to diet related disease. Health by stealth strategies and increasing exposure to dietary fibre via interventions such as in schools could be effective means to increase fibre intake.

METHODS

This presentation considers interventions developed in the "Healthy Soil, Healthy Food, Healthy People" (www.h3.ac.uk) programme grant which aim to increase fibre intake in children, adolescents and adults on low incomes in the UK. Reformulation of foods for school breakfast programmes, meals using high fibre ingredients available in food pantries and foodbanks were developed, trialled and evaluated in real world studies.

RESULTS

RESULTS of school based tasting studies demonstrate the acceptance of breads which are high in fibre or a source of fibre by children and adolescents and provide insight into the design if such products for school breakfast programmes. Evaluation of a large long term school breakfast programme which provided high fibre bread for 1 year showed acceptance of the food and also increased attendance, improved punctuality and narrowed the gap between free school meal eligible children and their food secure peers. Incorporating high fibre ingredients into familiar meals in interventions such as cooking classes for children and their carers, providing tasting sessions in food pantries and evaluating uptake of recipes developed demonstrated effective METHODSto increase fibre in low income consumers.

CONCLUSIONS

Taken together this range of interventions highlights the need to tailor nutritional interventions for low SES groups as a method to increase fibre intake, increase acceptability of higher fibre foods and ultimately to reduce health inequalities.

CONFLICTS OF INTERESTS

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SOAP29_08

ASSESSING THE SCHOOL FOOD ENVIRONMENT TO IMPROVE ADOLESCENT NUTRITION IN URBAN COMOROS: FROM POLICY AMBITIONS TO COMMUNITY REALITIES

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BACKGROUND AND OBJECTIVES

In Comoros, undernutrition among adolescents persists while overweight and obesity rates are rising, particularly in urban contexts. While nutrition education and physical activity are part of national school programs, we examined whether key stakeholders prioritized these areas for developing comprehensive school food and nutrition programs (SFNPs) and assessed their current implementation in schools.

METHODS

We consulted key stakeholders from international, national, and local levels - 8 multi-sectorial policy makers, 4 development program implementers and 1 nutrition researcher - using semi-structured interviews (SSI). Additionally, we conducted a survey in a random sample of 32 secondary public and private schools in Moroni-Bambao (urban) and Itsandra-Hamanvou (peri-urban). SSI were conducted with school heads (n=32), food vendors inside schools (n=9) and food vendors outside schools (n=15). The type of food sold by vendors were also collected on the day of the survey through direct observations (n=32).

RESULTS

All national stakeholders acknowledged the double burden of malnutrition as an urgency to tackle in their country and prioritized 3 domains to be improved in schools: food provision inside schools, food provision around schools and school community involvement into SFNPs for an effective and sustainable impact. All school heads declared promoting healthy eating and physical activity, with 29 schools offering classes on food or nutrition as part of the national program. Half of the schools also had extra-curriculum activities to encourage healthy behaviors. None of the sampled schools provided meals to pupils (no canteen); we observed 12 schools with cafeterias, primarily in urban areas, and 16 schools had external vendors at school gates. On the survey day, fried snacks, sweet cakes, and sugary drinks were the most commonly sold items across all schools, while fruits were offered in only two out of 32 schools. Snacks sold by food vendors inside schools were mainly processed snacks. External food vendors offered more homemade snacks but may raise food safety concerns. Few schools have attempted to ban unhealthy snacks in their premises, but school heads acknowledged that healthy and local alternatives were scarce, costly or unavailable.

CONCLUSIONS

Bridging the gap between evidence, policies, and practices is crucial to improving school food environments and ensuring healthy choices are accessible and affordable for all pupils. The next step of this study will be to conduct participatory workshops with the school community to develop solutions for healthier nutrition in schools, considering local resources.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP29_09

LINEAR GROWTH VELOCITY VARIES BY SEVERITY OF THINNESS IN NEPALI PRESCHOOLERS

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BACKGROUND AND OBJECTIVES

Wasting and stunting malnutrition often coexist in impoverished regions of the world, including Nepal. However, the influence of the degrees of antecedent wasting [weight (wt)-for-height (ht) z-score (WHZ) < -2] on preschool child linear growth velocity, and risk of becoming stunted [height-for-age z-score (HAZ) < -2] remains poorly understood.

METHODS

We analyzed longitudinal data on 5,930 children ≤60 mo of age with ≥ 1 pair of ht and wt measurements from the PoSHAN community studies (2013–2016). WHZ at the first measurement was stratified into decrements of ≥ 0, 0 to -1, -1 to -2, and <-2. Annualized linear growth velocities (LGV) were calculated as paired differences in ht, expressed in cm/yr, and as a LGV Z-score (Z) derived from a concatenated WHO-Tanner preschool annual LGV referent (Manohar et al. Publ Health Nutr 2023). Primary outcomes were differences between observed LGV and the age-sex-specific median referent LGV (ΔLGV), and relative odds (95% CI) of a LGVZ <-2, we define as growth faltering (GF). Baseline variables included child sex, age as natural splines, household socioeconomic and food security status, season and region (*Terai*, hills, mountains). Mixed effects models with random intercepts for child and cluster were used to explore associations between baseline thinness and subsequent LGV, ΔLGV, and odds of GF, controlling for above variables. Additional models were also run allowing for the interaction between WHZ strata and child age spline terms.

RESULTS

Initial WHZ was ≥ 0, 0 to -1, -1.01 to -2, and <-2 for 14.2%, 33.1%, 34.1% and 18.5% of children, respectively. Compared to children with WHZ ≥ 0, those with 0 to -1 had a significantly lower LGV of -0.47 cm/yr (95% CI: -0.59, -0.34) and higher odds for GF of 1.54 (1.27, 1.88). Children with -1 > WHZ ≥ -2 had a lower LGV of -0.69 cm/yr (-0.82, -0.56) and odds of GF of 2.19 (1.80, 2.67). Those with WHZ < -2 exhibited the greatest LGV deficit of -1.11 cm/yr (-1.25, -0.96), and relative odds GF, of 3.24 (2.63, 4.00).

CONCLUSIONS

Among Nepali preschool-aged children, compared to having a WHZ at/above the WHO median, linear growth velocity in progressively thinner children decreased, and risk of growth faltering increased, in a dose-responsive manner. In this undernourished population of South Asian children growing, on average, below a recently derived composite Tanner-WHO velocity reference, our findings reveal the importance of a normal weight-for-height to sustain adequate growth.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP29_10

STUDY ON THE PERCEPTION OF THE NUTRI-SCORE AND ITS IMPACT ON PURCHASING BEHAVIORS AMONG RETAIL MANAGERS AND CONSUMERS IN THE HAUTS-DE-FRANCE REGION

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BACKGROUND AND OBJECTIVES

The Hauts-de-France (HDF) region is facing a rise in chronic diseases linked to diet. Obesity and overweight are particularly prevalent. To address this issue, the Nutri-Score, a simple and clear nutritional labeling system, has been implemented. This color-coded system aims to help consumers make healthier food choices. In this context, the Nutricourses HDF project aims to evaluate the effectiveness of the Nutri-Score in the region, specifically by studying how it is perceived by retailers and its impact on consumer purchases.

METHODS

This observational study, conducted over 12 months (October 2023 - July 2024), is divided into two phases. The first qualitative phase involved seven individual interviews with managers of partner retailers to gather their perceptions of the Nutri-Score and its impact on consumer purchasing behaviors. The verbal data collected were transcribed, coded, and analyzed. The second quantitative phase was based on an online questionnaire distributed by partner retailers to their customers. This 25-item questionnaire, adapted from one developed by Santé Publique France, was used to collect data on purchasing habits and perceptions of the Nutri-Score. The data were analyzed using statistical software (SPSS and SPAD).

RESULTS

The RESULTS of the qualitative phase reveal differing opinions about the Nutri-Score: half see it as a clear tool with a stronger impact on online purchases and organic products. Conversely, half of consumers, according to the managers, perceive it as overly simplistic and difficult to understand. No local communication or marketing strategies have been implemented. In the quantitative phase, 1,762 responses were collected, of which 1,674 met the inclusion criteria. Respondents were predominantly women (74%), aged 50 to 64 years (39%), residing in the northern part of the region (74%), with a high school diploma or higher (67%), and either overweight (33%) or obese (19%). Three distinct profiles emerged: the advocate, the uninterested, and the uninformed. The non-classifiable participants (n=671) form a heterogeneous group with no clear stance on the nutritional label.

CONCLUSIONS

This first study on the Nutri-Score at a regional level reveals a mixed perception of the logo among consumers in the HDF region. While some distribution professionals view the Nutriscore as a valuable tool for consumers, others believe it is perceived as complex or overly simplistic, underpinning the neccesity to targeted communication strategies.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP29_11

BALANCING BUSINESS AND PUBLIC HEALTH: RETAILER PERSPECTIVES AND ECONOMIC IMPACT OF VOLUNTARY ENERGY DRINK SALES RESTRICTIONS

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BACKGROUND AND OBJECTIVES

Energy drinks (EDs) are highly caffeinated beverages associated with significant health risks for children and adolescents, including insomnia, anxiety and cardiovascular issues. Despite the evidence of harm, these beverages are readily available to young individuals in some regions. While numerous countries have implemented restrictions on selling these beverages to minors, they remain accessible in certain areas. This research investigated the feasibility, acceptability, and economic implications of voluntary restrictions on selling energy drinks to individuals under 18 at all retail outlets in a regional town. The study aimed to understand the role of retailers in supporting public health initiatives and the commercial outcomes of these voluntary restrictions.

METHODS

Using a matched prospective controlled design, we combined Interrupted Time Series analysis of sales data with qualitative interviews of retailers (n=19) conducted before and during the implementation of a 4-month voluntary sales restriction of energy drinks to children under 18 years.

RESULTS

RESULTS indicated the four-month restriction did not adversely affect overall beverage sales, with retailers reporting shifts toward alternative products that offset potential losses. Qualitative findings demonstrated strong retailer support driven by youth wellbeing concerns and positive community reception of the voluntary sales restriction, which facilitated smooth implementation.

CONCLUSIONS

Our findings suggest voluntary ED sales restrictions can be feasibly implemented without compromising business viability, while protecting youth health. This community-driven initiative offers valuable insights for policymakers and retailers considering similar public health measures.

CONFLICTS OF INTERESTS

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SOAP29_13

FORMULATION OF NUTRIENT-DENSE BISCUIT TO REDUCE MALNUTRITION PREVALENCE AMONG VULNERABLE SCHOOL AGE CHILDREN IN NIGERIA

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BACKGROUND AND OBJECTIVES

The causes of undernutrition are multifactorial, with the condition mostly influenced by several factors, (Mogaji, et al 2022). Nutrition Intervention (NI) is essential to reduce malnutrition prevalence in Nigeria.

METHODS

A quasi-experimental study was conducted among 5,040 School Age Children (SAC) in South West Nigeria. A validated semi-structured interviewer-administered questionnaire was developed to obtain information on respondents' demographic characteristics at baseline. Anthropometric measurements were taken, 24-hour dietary recall questionnaire administered and Nutrient Dense Biscuit (NDB) was developed. SAC with mild/moderate thinness were randomly divided into four groups at midline: group I, 28g NDB was consumed, II, 56g NDB, III: 33g conventional biscuit and IV (no biscuit consumed). Endline evaluation was conducted by re-assessing respondents' nutritional status. WHO-Anthro plus and adapted Food Processor Softwares were used to determine SAC's nutritional status. NDB's efficacy was deduced by change in z scores before and after intervention of 10 weeks and 5 measurements.

RESULTS

SAC's mean age was 8.91 ± 2.08years. At baseline, prevalence of severe stunting (4.2%) thinness (16.8%) and underweight (5.8%) were statistically significantly different across Nigeria **(**p=0.000**),** likewise **e**nergy/protein intakes. Conventional biscuit was most efficacious compared to 56g NDB, 28g NDB was the least efficacious. Factors responsible could be composition of NDB, and nutrient requirements of participants.

CONCLUSIONS

This study's NDB did not significantly reduce mild/moderate malnutrition among vulnerable SAC in South West Nigeria. This must have been influenced by several confounding factors, such as cashless policy and economic meltdown. Further grouping into intervention should factor requirements, age, wealth status and mean nutrient intake.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP29_14

Monitoring micronutrient status in the UK - recent RESULTS from the UK National Diet and Nutrient Survey

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BACKGROUND AND OBJECTIVES

Since 2008, the UK National Diet and Nutrition Survey (NDNS) has provided nationally representative cross-sectional data on the diet and nutritional status of the UK population aged ≥1.5 years. Here we present objectively measured data from the most recent round of NDNS for folate status prior to the introduction of folic acid fortification in the UK, and the status of other B-vitamins.

METHODS

Data collection was performed between October 2019 and July 2023 bar a suspension of fieldwork during 2020 due to the COVID-19 global pandemic. Blood specimens were collected by trained biomedical fieldworkers in participants' homes and specimens were mailed overnight, cooled, to a central laboratory for processing. Specimens were subsequently measured for a range of micronutrient biomarkers including the following B-vitamins: vitamin B1 (erythrocyte transketolase activity coefficient [ETKac]), vitamin B2 (erythrocyte glutathione reductase activity coefficient [EGRac]), vitamin B6 (high performance liquid chromatography), serum folate (liquid chromatography tandem mass spectrometry), whole blood folate (microbiological assay) and vitamin B12 (and holotranscobalamin).

RESULTS

Between 2019 and 2023, blood specimens were collected from 292 children and 791 adults. Using these data (publication due in Spring 2025), we will provide the most recent estimates of micronutrient status in the UK, including for folate status prior to the introduction of folic acid fortification of non-wholemeal wheat flour scheduled for introduction at the end of 2026.

CONCLUSIONS

Objectively measured micronutrient status data are essential to determine the burden of micronutrient deficiencies in populations and to monitor the effectiveness of public health programmes. In the UK, the NDNS provides high quality, population representative data on micronutrient status that are used to inform and monitor the impact of public health policy, e.g. introduction of folic acid fortification, and that can contribute to knowledge on micronutrient status globally.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP29_15

MOBILITY AND EXPOSURE TO MULTIPLE FOOD ENVIRONMENTS IN CHILDREN AGED 10-14 YEARS

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BACKGROUND AND OBJECTIVES

Physical environments influence the availability and consumption of food. Every day people are exposed to different food environments according to the daily activities they carry out, the means of transport and the design of the cities.

Objetive: explore the spatio-temporal dynamics of the mobility of children aged 10 to 14 years living in different socioeconomic strata and its relationship with food availability.

METHODS

Case study involving children between 10 and 14 years old who live in areas with socioeconomic strata between 1 and 5. The travel diary, photography and drift were used as data collection techniques.

RESULTS

The RESULTS showed that the mobility of the participants exposes them to multiple food environments, so food exposure is not fixed, since, depending on the means of transport and the time at which they move, the offer varies. Children who reside in the lower socioeconomic strata and who also walk are more exposed to ultra-processed foods than those who travel by motorized means of transport. Thus, mobility dynamics facilitate exposure to multiple food environments, which is a threat to health.

CONCLUSIONS

The spatial and temporal mobility dynamics of children facilitate exposure to multiple environments where processed and ultraprocessed foods predominate, which is a threat to health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP29_16

END USERS, REGULATORS, IMPLEMENTERS AND HEALTHCARE PROFESSIONALS' AWARENESS, IMPLEMENTATION AND USE OF THE 2007 WHO GUIDELINES ON THE SAFE PREPARATION, STORAGE AND HANDLING OF POWDERED INFANT FORMULA: QUALITATIVE FINDINGS FROM GHANA, ENGLAND AND WALES

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BACKGROUND AND OBJECTIVES

The 2007 WHO guidelines for safe Powdered Infant Formula (PIF) Preparation, Handling and Storage were developed following PIF-linked C.Sakazakii, S.Enterica and S.Agona infection outbreaks causing diarrhoea and deaths. We investigated the awareness, usage, and barriers to using of the guidelines among implementers/regulators and end-users (healthcare and nursery workers, care providers) in Ghana, Wales and England.

METHODS

We conducted semi-structured interviews (SSI) with purposively selected participants. The recordings were transcribed and analysed thematically using *a priori* and emerging themes.

RESULTS

44 participants were interviewed (23 Ghana, 8 England, 13 Wales; of 23 mothers/non-professional caregivers, 12 nursery teachers/professional caregivers, 7 healthcare professionals, and 2 implementers/regulators). In all settings, knowledge on PIF preparation was acquired mainly from producers' manuals/label information. Training/education for all was reported to be very low, mainly in Wales. Practices by end-users were largely unregulated and subject to diverse influences including personal choice and producers' information. Generic precautions for food safety were common but not related to reducing pathogens. Awareness of 2007 WHO PIF Guidelines was low in all 3 countries. The awareness was lowest in Ghana (5/23-) followed by England (2/8) but in Wales (5/13). Participants encountered the PIF Guidelines through various information sources, including electronic media, training workshops, and interactions with professional colleagues. Dissemination and implementation among end-users appeared to be uncoordinated in all settings. National policy favouring breastfeeding and the resulting 'taboo' around the use of PIF were identified as barriers to guideline dissemination and implementation across the 3 countries.

CONCLUSIONS

The 2007 WHO PIF Guidelines are largely unknown and not used in our high- and low-income countries, posing an infection risk. PIF is a child nutrition supplement inevitably used in all countries. There is a need for training on safe PIF practices for all end-users, without compromising exclusive breastfeeding promotion.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 30 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP30_01

ESTIMATING THE POTENTIAL HEALTH IMPACTS OF THE UK SALT REDUCTION PROGRAMME ON CARDIOVASCULAR DISEASE: FINDINGS FROM A MODELLING STUDY

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BACKGROUND AND OBJECTIVES

Excessive dietary sodium contributes to approximately 3 million deaths globally each year. The UK is among 64 countries with a salt reduction programme. It has set voluntary salt content targets for 84 grocery categories and 24 out-of-home categories to be achieved by 2024. This study aimed to estimate the potential impact of these salt reduction targets on cardiovascular outcomes and healthcare costs for UK adults.

METHODS

This was a simulation modelling study using dietary data from 586 individuals to estimate the potential impact of changes in salt intake among adults aged 18 and over in England. The 2020 population data for adults in England was used, with intake changes modelled based on the National Diet and Nutrition Survey (2017/18). The effects on ischaemic heart disease (IHD) and stroke were assessed over 20 years using PRIMEtime, a multistate lifetable model. Healthcare costs and Quality-Adjusted Life-Years (QALYs) were calculated for the population's remaining lifetime.

RESULTS

If the UK salt reduction targets for 2024 were fully achieved, average daily salt intake is estimated to decrease from 7.06g to 5.75g (17.5% reduction). This would result in 114,000 fewer cases of IHD and 27,000 fewer cases of ischaemic stroke over 20 years. We predict a saving of 537,000 QALYs and a net cost reduction of £1.10 billion to the NHS over the lifetime of the adult population.

CONCLUSIONS

Industry reformulation to meet salt reduction targets could substantially lower cardiovascular disease burden without requiring changes in consumer behaviour. Policymakers should consider enhancing salt reduction policies, including better monitoring and implementation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP30_02

NUTRISHED: A FRAMEWORK TO ASSESS THE RESILIENCE OF KEY NUTRIENT FLOWS IN URBAN FOOD SYSTEMS

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BACKGROUND AND OBJECTIVES

The resilience of food supplies into cities in LMICs face multidimensional threats: climate change, shock events, and shifting consumer demands. However, quantities, sources, and seasonality of food flows into and within cities remain scant, leaving decision-makers with limited capacity to improve access to healthy diets. Building on 'foodshed' approaches, we develop the NutriShed methodology to map urban-bound flows of key limiting nutrients, identify spatiotemporal vulnerabilities, and develop solution space of prospective interventions and food system policies.

METHODS

The NutriShed methodology was deployed in 2 urban settings in Ghana:Takoradi and Asesewa. First, indicative dietary surveys (n=616) with mothers, adolescents and young children identified limiting nutrients in both communities, to inform a shortlist of nutrient-dense foods of interest in local markets. Then at 1047 checkpoints on selected roads into markets, traders completed a 5-minute survey about origins and quantities of food shipment. This data supplemented market (n=181), consumer backtracking (n=50) and food systems infrastructure surveys (n =169), and qualitative key informant interviews on issues associated with food safety, transportation, and retailing (n=15). Finally, geospatial techniques were integrated with systems thinking principles to identify chokepoints in food distribution pathways, existing infrastructure landscape and market environments.

RESULTS

Diets were limited in Ca, Fe, FA and vitamin B2, leading to identification of 15-20 nutrient-dense foods commonly consumed in the two citiess. Food flow mapping identified various catchment areas, seasonal quantities, and common transportation forms distributing these foods towards the study communities. In both sites, existing food systems infrastructure were spatially-clustered around markets. However, a mismatch was found between current facilities use and need to store highly perishable nutrient-dense foods, indicating vulnerability to accessing critical nutrients.

CONCLUSIONS

Local decision-makers require reliable and timely information on the types (i.e., what?), sources (i.e., where?) and seasonality (i.e., when?) of nutrient-dense food supplies. As standalone approaches, the METHODSenable local planners and decision-makers to identify seasonal sources, destinations and quantities of nutrient-dense foods traded. Integrated into a holistic methodology, the NutriShed approach highlights the critical vulnerabilities affecting flow of nutrient-dense foods across space and time.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP30_03

Impact of targeting strategies for balanced energy protein supplementation in pregnancy on adverse birth outcomes: RESULTS of a cluster randomized controlled trial in rural Bangladesh

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BACKGROUND AND OBJECTIVES

Balanced energy-protein (BEP) supplementation is a WHO recommended intervention to reduce the risk of adverse birth outcomes such as small-for-gestational-age (SGA) and low birth weight (LBW) in undernourished settings. However, there is limited evidence that targeting individual undernourished women is more effective than untargeted supplementation. We aimed to assess both a targeted and an untargeted approach to daily fortified BEP supplementation (containing 15 nutrients at an RDA for pregnancy and 500 mg calcium) during pregnancy on the primary outcomes of birth weight, LBW and SGA, compared to the control of daily multiple micronutrient supplements (MMS) using the UNIMMAP formulation.

METHODS

A four-arm, cluster-randomized controlled trial is ongoing in rural Bangladesh. From 12 weeks of gestation until pregnancy outcome, participants aged 15–35 years old in the study area comprising 240 predefined sectors were randomly assigned to one of four intervention arms: (1) MMS (control), (2) BEP, (3) BEP for those with pre-pregnancy body mass index (BMI) <18.5 kg/m2, while those with a pre-pregnancy BMI ≥18.5 kg/m2 received daily MMS or (4) BEP for those with pre-pregnancy BMI <18.5 kg/m2, MMS for others, with a switch to BEP if inadequate gestational weight gain was identified. Birth outcomes were assessed within 72 hours. Continuous outcomes at birth will be analyzed using linear regression with generalized estimating equations (GEE) to account for cluster design. For binary outcomes, relative risk ratios (RRRs) and absolute risk differences will be calculated using log-binomial regression with GEE. The impact of targeted and untargeted BEP compared to MMS will be assessed (Arm 1 vs: Arm 2; Arm 3; Arm 4).

RESULTS

In total 3390 pregnant women were enrolled in the trial between October 2022 and August 2024. At enrollment mean ± SD gestational age was 9.9±3.6 weeks, age was 23.6±5.4 years, hemoglobin was 116.0±11.7 g/L, BMI was 21.8 ± 3.7 kg/m2 (18.9% BMI<18.5) and MUAC was 26.2 ± 3.3 cm (16.7% MUAC<23.0 cm), and comparable across groups. Birth outcome follow up and assessment will conclude in March 2025. The effects of targeted and untargeted BEP supplementation versus MMS on adverse birth outcomes will be presented.

CONCLUSIONS

The findings will provide evidence for targeted BEP supplementation to identify beneficiaries and improve birth outcomes, hence strengthening the WHO's contextual recommendation for BEP supplementation in pregnancy.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP30_04

SHOULD POPULAR WEIGHT-LOSS SUPPLEMENTS BE CONSIDERED SAFE? A SYSTEMATIC REVIEW OF CASE REPORTS OF GARCINIA CAMBOGIA SUPPLEMENTS

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BACKGROUND AND OBJECTIVES

Hydroxycitric acid (HCA), derived from the plant Garcinia cambogia, has been widely promoted as a weight-loss supplement. However, increasing reports of adverse events associated with its use have raised concerns about its safety. This study aimed to review case reports and series to assess the clinical outcomes and causality of adverse events linked to HCA and Garcinia cambogia intake.

METHODS

Pubmed, Embase and the Cochrane library databases were searched up to May 22, 2023 for eligible publications. We systematically reviewed published case reports and series where Garcinia cambogia or HCA was implicated as a causative agent. Data on demographics, clinical presentation, dosing, duration of use, co-medications, medical history, recovery, and causality assessment scales were extracted.

RESULTS

Among 28 publications reviewed, 32 cases (75% women, median age 44 years (16y-82y)) reported adverse events linked to consumption of Garcinia cambogia extracts as the exclusive suspected agent. Daily doses ranged from 250 mg to 2000 mg (in 75% of cases not reported), with durations of use ranging from 2 days to 1 year. Hepatic injury (56%, 18 cases) with elevated liver enzymes was the most prevalent adverse event, followed by mania, pancreatitis, and cardiac injury. Specifically on hepatotoxicity, causality assessments (including Roussel Uclaf Causality Assessment Method scores) categorised 28% of cases as very probable, 28% as probable and 11% as possible. Four cases required liver transplantation. Recovery was documented in all the cases except one, which was fatal. Additionally, 73 cases reported adverse events (including 81% liver injury and 8% neurotoxic effects) to Garcinia cambogia extracts in combination with other ingredients. Regarding hepatotoxicity, in 47% of cases, Garcinia cambogia extracts were assessed as definitive or highly likely causative.

CONCLUSIONS

The temporal relationship between Garcinia cambogia use and adverse events highlights potential toxicity. While hepatotoxicity remains the primary concern, cardiac and neuropsychiatric effects warrant attention. The findings emphasize the need for public awareness of the potential risks associated with Garcinia cambogia and HCA supplementation. Future studies should explore the mechanisms underlying these adverse effects.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP30_06

CREATING A GLOBAL CALCIUM DASHBOARD TO HIGHLIGHT COUNTRY-SPECIFIC DATA ON CALCIUM INTAKES, POLICIES, AND RELATED HEALTH OUTCOMES

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BACKGROUND AND OBJECTIVES

Low calcium intake is a pervasive global health problem that can profoundly impact maternal health, neonatal survival, and the development of chronic health problems such as osteoporosis. Despite its important health implications, fragmented data on calcium intakes and related health outcomes have hindered strategic responses. The aim of this project is to develop a centralized, interactive platform that visualizes calcium intakes, associated health outcomes and policies across countries. This tool seeks to give stakeholders useful insights to promote fair resource distribution, shape public health policies, and boost the impact of efforts to address inadequate calcium intake.

METHODS

The Global Calcium Dashboard integrates datasets that include calcium availability, calcium intake, as well as calcium supplementation, and fortification programs and legislation from over 150 countries. Epidemiological data on preterm births, maternal hypertensive disorders, and other calcium related health outcomes were also incorporated to highlight areas with the greatest potential need for improved calcium intake. These data were sourced from national surveys, international health organizations, scientific literature searches through multiple systematic reviews, and published modeled estimates. These data can be visualized in a series of online maps and country profiles that describe the available information for each country and enable the identification of health disparities, and critical data gaps related to calcium as well as opportunities to design tailored strategies.

RESULTS

The Global Calcium Dashboard reveals that data coverage is comprehensive for high- and middle-income countries, with detailed records on daily calcium intake and related health outcomes. However, low-income countries often lack granular data, creating challenges for targeted interventions. Analysis of the data shows significant variation in calcium intake globally, with over 60% of countries not meeting the requirements. Furthermore, supplementation initiatives are documented in less than 40% of the countries surveyed, highlighting the need for an increased emphasis on these efforts.

CONCLUSIONS

The Global Calcium Dashboard is a data repository, serving as a transformative framework for addressing calcium-related global health challenges. By bringing together diverse datasets, the maps of the Global Calcium Dashboard offer country-specific information on calcium intake, health outcomes, and current policies, enabling targeted interventions. It also serves as an instrumental tool for advocacy and education, and driving policy changes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP30_07

RISK FACTORS FOR MENTAL DISORDERS IN PREGNANT WOMEN: A COMPARISON BETWEEN THE JUNDIAÍ AND ARARAQUARA COHORTS IN BRAZIL

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BACKGROUND AND OBJECTIVES

Mental disorders during pregnancy are a significant public health problem due to the substantial physiological and psychological changes that occur during this period. This study aims to investigate the risk factors for mental disorders in pregnant women by comparing data from two distinct cohorts in Jundiaí and Araraquara, Brazil.

METHODS

This is a prospective cohort study that included pregnant women from two Brazilian cohorts. The Jundiaí cohort (1997-2000) included 865 pregnant women, while the Araraquara cohort (2017-2023) included 755 pregnant women. Socioeconomic, demographic, obstetric history, and mental health data were collected and analyzed. Mental health was assessed using standardized questionnaires, including the General Health Questionnaire (GHQ), the State-Trait Anxiety Inventory (STAI), and the Perceived Stress Scale (PSS). Statistical analysis included bivariate tests and univariate and multivariate random-effects models for panel data.

RESULTS

The RESULTS indicated higher levels of anxiety, depression, and perceived stress in the Araraquara cohort compared to the Jundiaí cohort study. Socioeconomic factors such as being single, separated or widowed, lower per capita income, lower educational levels, higher household density, and morbidity during pregnancy such as urinary infection, pyelonephritis, gestational hypertension, tuberculosis, cervicitis, and vaginitis were the risk fators identified.

CONCLUSIONS

The findings of this study highlight the need for targeted interventions for pregnant women in vulnerable situations, including socioeconomic support, improvements in living conditions, and access to adequate health care. Additionally, it is essential to integrate mental health services into prenatal care to monitor and treat health complications that may affect the mental health of pregnant women.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP30_08

A 'VALUE FOR INVESTMENT' ANALYSIS OF FREE, HEALTHY SCHOOL LUNCHES IN NEW ZEALAND

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BACKGROUND AND OBJECTIVES
Free, healthy school lunch programs are both costly and beneficial and New Zealand's new program (Ka Ora, Ka Ako) is highly politically contested. However, assessing the return on investment using standard METHODSis fraught because important, non-monetizable benefits are usually omitted. The objective of this study was to use the interdisciplinary, participatory method called Value for Investment (VfI) analysis to provide a comprehensive, evidence-based, stakeholder-defined assessment of the value of Ka Ora, Ka Ako.
METHODS

Three workshops were conducted with key stakeholders from schools, the community, lunch providers, and government agencies to define the value proposition of the program and the value criteria, standards, and evidence indicators for rating the levels of value created by the program. The evaluation team collated the evidence which was presented at the fourth workshop where stakeholders made evaluative judgements about the program's performance in achieving each of the values determined in the value proposition.

RESULTS

Over 3 workshops, 91 stakeholders co-created the value proposition statement: "A healthy, tasty, sustainable, equitable, free school lunch system that contributes to improving food security, nutritional health and wellbeing, learning outcomes, environmental sustainability, and local economies and communities" and 21 criteria upon which they would judge the program's performance and value. In economic terms there were 10 criteria for effectiveness, 5 for efficiency, 3 for equity, 2 for economy (money stewardship), and 1 for cost-effectiveness. Evidence from 44 sources were collated and summarised and presented to the fourth workshop (19 stakeholders). They rated the program's performance as Excellent for 8 criteria, Good for 11, Adequate for 2, and Poor for none. In particular, the 6 criteria relating to the government's initial justification for the program scored Excellent (Improved healthy eating: Reduced financial burden on disadvantaged households) or Good (Alleviating hunger at schools; Improved diet-related outcomes; Strengthened local economies; Reduced barriers to education and improved long-term educational outcomes).

CONCLUSIONS
The participatory VfI approach enabled stakeholders to define the wide range of the program's expected values and create evidence-based ratings for each value. The program rated very well but despite these very positive RESULTS, it has since suffered major budget cuts. This study also demonstrates how the VfI approach provides transparent, evidence-based assessments of value for money in contexts that often resist economic analysis.
CONFLICTS OF INTERESTS
All other authors have no conflicts of interestJulian King developed the Value for Investment methodology which he uses in his consulting business.

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SOAP30_09

THE ASSOCIATIONS BETWEEN MATERNAL MILK MICROBIOME, OLIGOSACCHARIDES AND INFANT GUT MICROBIOTA: INSIGHTS FROM A BURKINABE COHORT STUDY

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BACKGROUND AND OBJECTIVES

Human milk feeding supports infant development and protects against diseases, potentially through human milk oligosaccharides (HMOs) and milk-associated bacteria. However, the dynamics of milk microbiome and HMO composition, and their impact on infant gut microbiota in low- and middle-income countries remain underexplored, especially in the context of maternal nutritional challenges.

METHODS

We analyzed fecal and milk samples from 152 mother-infant pairs in Burkina Faso participating in a maternal nutrition intervention. Maternal gut microbiota were analyzed using metagenomic sequencing during pregnancy (second and third trimester) and lactation (1-2 and 5-6 months postpartum), and infant gut microbiota were profiled at 1-2 and 5-6 months. Milk microbiome and HMO composition were analyzed with 16S rRNA sequencing and HPLC, respectively, at 14-21 days, 1-2, and 3-4 months postpartum.

RESULTS

Infant gut microbiomes at 1-2 months clustered into three patterns: Bifidobacterium-dominated, Escherichia-dominated, and a diverse group. These patterns converged by 5-6 months due to exclusive breastfeeding. Maternal gut microbiota at trimester 3 strongly correlated with infant gut microbiota, but postnatal maternal samples did not. Milk microbiome diversity mirrored infant gut clusters at 3-4 months, with temporal correlations evident only at matching time points. Infant gut Bifidobacterium species correlated with fucosylated HMOs, such as 2'Fucosyllactose (2′FL) at early time point, and correleated with sialylated HMOs later. Redundancy analysis revealed that HMOs were significant drivers of infant gut microbiota variance, surpassing milk microbiome contributions.

CONCLUSIONS

Optimizing maternal nutrition to enhance HMO profiles may foster healthier infant gut microbiota development in resource-limited settings.

CONFLICTS OF INTERESTS

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SOAP30_11

Impact of Cash Transfers and Digital Nutrition Counselling on Maternal Nutrition Knowledge: RESULTS from the Shonjibon Trial

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BACKGROUND AND OBJECTIVES

The Shonjibon Trial (ACTRN12618001975280), a cluster randomised controlled trial, assessed the effectiveness of a multifaceted intervention combining unconditional cash transfers, a mobile app, and phone-based nutrition counselling in reducing child stunting in Bangladesh. This study presents the impact of the intervention on participants' nutrition knowledge, a critical determinant of improved maternal and child health outcomes.

METHODS

The trial was designed as a two-armed cluster randomised controlled trial. Participants in the intervention arm received unconditional cash transfers along with access to the "Soi Barta" mHealth app and the "Soi Pushti Sheba" counselling service. The app provided stage-specific multimedia nutrition advice tailored to pregnancy and early childhood, while trained counsellors delivered empathetic, personalized guidance to address beliefs, barriers, and motivations. Nutrition knowledge was assessed at enrolment (during the first trimester of pregnancy) and at the study endpoint (18 months postpartum) using a 24-item questionnaire. The questionnaire was tailored for pregnant women from rural communities, focusing on practical and culturally relevant nutrition concepts. The impact of the intervention on knowledge scores was analyzed using ANOVA, with pairwise comparisons to identify differences between groups.

RESULTS

A total of 2,243 participants were included in the analysis. The mean score in the intervention arm increased from 11.0 (SD 2.8) at baseline to 14.9 (SD 3.4) at endline. Similarly, in the control group, the mean score increased from 10.2 (SD 2.6) at baseline to 12.3 (SD 3.8) at endline. The mean score improvement in the intervention arm was 3.9 (SD 4.0), compared to 2.1 (SD 4.4) in the control arm. ANOVA revealed a statistically significant effect of the intervention on changes in nutrition knowledge scores ($p < 0.001$). Participants in the intervention arm experienced a significantly greater mean improvement in knowledge scores compared to the control arm (mean difference 1.80, 95% CI: 1.45–2.15, $p < 0.001$).

CONCLUSIONS

The Shonjibon Trial demonstrated that mobile app and phone-based nutrition education can enhance maternal nutrition knowledge in a low-resource setting. The integration of digital tools with personalized counselling showed considerable promise in addressing maternal and child nutrition challenges in vulnerable populations across South Asia. While improved knowledge is a critical precursor to behavior change, its translation into improved nutrition practices and health outcomes requires further investigation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP30_13

EVOLUTION OF LEGUMES CONSUMPTION AND ASSOCIATED FACTORS IN THREE WEST AFRICA COUNTRIES

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BACKGROUND AND OBJECTIVES

The importance of legumes in traditional West African diets is well established. However, their consumption has evolved over the years. This study analysed the changes in their consumption and associated factors in Benin, Burkina Faso and Senegal, as well as options for promotion.

METHODS

In each country, focus group discussions (FGD) were held in various regions in both rural and urban areas (n=32). In each study site, two FGD were held: one with young women (18-35 years) and the second with older women (50-65 years). We investigated changes over time in the levels and forms of consumption of legumes, factors associated and strategies for promotion. Discussions were recorded, transcribed and then, organized a thematic analysis.

RESULTS

There is a diversity of 14 legumes consumed across the three countries, with slight differences. Pulses such as cowpea, bambara pea, Kersting's groundnut, lentil, lima bean and pigeon pea have been consumed for a long time. Consumption of 'traditional' legumes has declined over time, due to falling production, rising prices, replacement by 'new' species, and existence of prohibition/negative perception. They are generally not much appreciated by the young generation; youth preferring easy-to-cook modern foods. However, legumes such as soybean, mung beans and split peas, are relatively recent and seeing increasing uptake. Soya consumption has risen sharply over the last twenty years in both urban and rural areas of Benin and Burkina Faso. Soya is consumed in several forms. In Benin, soya cheese (i.e. tofu) is the main form consumed. It is available, cheap and used in sauces. It replaces fish and meat: '200 XOF francs worth of [soy]cheese is enough to make a sauce for my whole family, and everyone will be happy! It's very economical. It would be impossible with fish'. In addition, traditional legume-based recipes with high nutritional potential are being abandoned. Promotion strategies identified included access to quality seeds and inputs to improve productivity, raising awareness among the nutritional benefits of pulses, and developing new processing technologies. Marketing strategies such as quest for new markets, price reduction, etc. can be important levers for encouraging their consumption.

CONCLUSIONS

There is a diversity of legumes with many forms of consumption in Benin, Burkina Faso and Senegal. However, some species and forms of consumption are disappearing or are tending to be abandoned. It is, therefore, important to work on improving the image of legumes, in order to maintain their high existing consumption level within the population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP30_14

LONGITUDINAL CHANGES OF HUMAN MILK LACTOFERRIN DURING THE FIRST YEAR: A PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES

Lactoferrin (Lf) is an important bioactive protein in human milk involved in diverse biological functions. Concentrations of milk Lf are tightly regulated during lactation. This study aims to explore longitudinal changes of human milk Lf concentrations during the first year postpartum and to identify the associated factors.

METHODS

This prospective cohort study recruited 160 dyads of healthy mothers and their newly delivered full-term newborns in Wuqiang, Hebei province, China. Characteristics of mothers and infants were collected using a structured questionnaire. Concentrations of milk Lf were measured by using an Enzyme-linked Immunosorbent Assay kit. Linear mixed model was used to examine its longitudinal changes and associated factors.

RESULTS

The mean concentrations of milk Lf were 7.17 g/L, 4.02 g/L, 2.95 g/L, 2.19 g/L, and 2.43 g/L at 0-7 days, 30 days, 3 months, 6 months, and 12 months postpartum, respectively. The frequency of breastfeeding in the prior 24 hours was negatively associated with Lf concentrations (P = 0.017). Prenatal mean corpuscular volume (MCV) status may influence the longitudinal changes of milk Lf (PMCV*time = 0.011).

CONCLUSIONS

The concentration of milk Lf decreases during the first 6 months and increases from 6 to 12 months, with its change possibly being associated with feed frequency and prenatal MCV status.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP30_15

ENHANCING ADHERENCE TO BALANCED ENERGY PROTEIN SUPPLEMENTS THROUGH COMMUNITY HEALTH RESEARCH WORKERS IN RURAL BANGLADESH

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BACKGROUND AND OBJECTIVES

Balanced energy protein (BEP) supplements improve maternal and newborn health, but limited program examples make it crucial to identify strategies for enhancing adherence, especially as cultural and practical barriers persist.This study explores how community health research workers (CHRWs) motivate pregnant women to improve BEP adherence in a community-based trial in northern Bangladesh.

METHODS

Six focus group discussions were held with 35 CHRWs (n≅6 per group), selected for the research study and responsible for delivering BEP supplements and supporting adherence through the JiVitA Project in Gaibandha, Bangladesh. Data were collected using field guides and analyzed thematically.

RESULTS

CHRWs explained their roles in promoting adherence through culturally sensitive communication and consistent follow-up to integrate BEP supplementation into the maternal and child health-related beliefs of trial participants and their families. By delivering appropriate messages on BEP consumption and health awareness, community health research workers emphasized the importance of regular BEP supplementation in improving maternal and child health, supporting healthier pregnancies, and achieving adequate weight gain. Their trusted status enabled them to address cultural beliefs and misconceptions, making the intervention more acceptable. CHRWs also enhanced access and adherence by delivering supplements directly to households, encouraging the integration of supplements into traditional dietary practices, and offering consistent and frequent follow-ups outside their regular hours. CHRWs described challenges such as traveling on bicycles to reach women’s homes and sometimes not finding them at home, some refusals due to perceived side effects, and disapproval from some husbands and mothers-in-law. CHRWs actively involved husbands, mothers-in-law, and female neighbors to foster a collective understanding of the benefits of BEP. CHRWs believed the community's trust in the JiVitA Project had created a supportive environment for women to adopt and adhere to BEP.

CONCLUSIONS

CHRWs helped to ensure adherence to BEP supplementation by building trust, delivering tailored health messages, and ensuring consistent follow-up with the women. Policies should consider adequate support to nutrition programs through workload management, transport, financial incentives, and addressing field challenges faced by CHRWs. Funding: This work was supported by the Bill and Melinda Gates Foundation grant number INV-033381.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 33 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP33_01

EVALUATION OF THE FOOD ENVIRONMENT AT THE PARIS 2024 OLYMPIC AND PARALYMPIC GAMES

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BACKGROUND AND OBJECTIVES

Recent global focus on sustainability of the Olympic and Paralympic Games (OPG) by the International Olympic Committee (1) was a key feature of the Paris 2024 OPG. This included a food vision that aimed to reduce environmental impact through specific strategies such as providing plant-based food, locally sourced suppliers and no plastics (2). Despite this, the food environment at the OPG must be suitable for the performance, health and cultural needs of athletes from over 200 countries (3). The aim of this study was to investigate the safety and suitability of the Paris 2024 OPG food provision for athletes in the context of the food vision focused on environmental sustainability.

METHODS

A mixed METHODSstudy design was employed using a previously developed survey instrument specific for this environment (4) that was implemented with experienced sports nutrition experts in advance (n=13) and during the event (n=11); and a series of focus group discussion with 17 sports nutrition experts affiliated with national Olympic and Paralympic teams who had attended the Paris 2024 OPG and experienced the food provision for athletes. Focus group discussions were recorded, transcribed and thematically analysed, while survey RESULTS were descriptively analysed and RESULTS used to further inform emerging themes.

RESULTS

Experts' overall ratings of the food provision for athletes during the Paris 2024 OPG was 5.0 / 10, in comparison to 7.7 /10 for the proposed menu reviewed 12 months prior to the event. Emerging themes from focus group discussions included issues with food safety, cross contamination, insufficiency of animal protein, accessibility to water and lack of specific cultural items, although this was noted as improving over time. Experts recommended the development of a framework to guide caterers appointed to provide food, improved early engagement by caterer and organisers with team dietitians and inclusion of food service nutrition experts during the planning phase.

CONCLUSIONS

While the food vision that aimed to reduce environmental impact was recognised as important by all experts, RESULTS of this study suggest that a more balanced approach that equally meets the performance and health needs of athletes is necessary. The development of a framework of standards for food provision at the OPG would benefit organisers and caterers in the future.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP33_02

EGCG IMPROVE THE SKIN AGING OF C57BL/6J MICE BY MODULATING SIRT1/FOXO1 PATHWAY

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BACKGROUND AND OBJECTIVES

The skin is integral to the maintenance of body homeostasis. Addressing the issue of skin aging, which is partly induced by glycosylation, is becoming increasingly imperative. The aim of this study is to examine the potential of EGCG in decelerating skin aging and to elucidate its underlying mechanisms.

METHODS

Eight-month-old C57BL/6J mice were randomly allocated into four experimental groups: Normal, EGCG-low (50 mg/kg/d), EGCG-high (50 mg/kg/d), and an aging model group. The aging model group was provided with a diet enriched in advanced glycosylated end products. Additionally, six-week-old C57BL/6J mice were utilized as the young control group. Following a four-month intervention with EGCG, dorsal skin samples were collected for pathological analysis and assessment of substances associated with the aging process.

RESULTS

The RESULTS demonstrated that high-dose EGCG treatment resulted in a statistically significant reduction in N-ε-Carboxymethyllysine content ($p < 0.05$). When compared to the aging model groups, EGCG treatment was associated with an 0.8-fold increase in Hyp content and a 4.85-fold increase in COL1A1 expression, while MMP-3 expression decreased by 0.93-fold. Furthermore, the study observed that high-dose EGCG intervention led to enhanced aging outcomes, as demonstrated by a significant reduction in the senescence-associated secretory phenotype (SASP) such as IL-1β, IL-6, MMP-1 ($p<0.05$), and p16 expression. Notably, the administration of high doses of EGCG resulted in significant improvements in SOD levels, increasing from 88.19±15.07 U/mg to 108.69±19.49 U/mg, GSH levels from 15.84±6.15 U/mg to 45.10±14.40 U/mg, and CAT levels from 0.62±0.26 U/mg to 1.78±0.48 U/mg. These improvements can be partially ascribed to the upregulation of NRF2 expression, as well as the phosphorylation of Sirt1 and Foxo1.

CONCLUSIONS

The potential anti-aging effects of EGCG may be attributed to its antioxidative benefits, which are mediated through the activation of the Sirt1/Foxo1 pathway.

CONFLICTS OF INTERESTS

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SOAP33_05

THE IMPLEMENTATION OF PILOT PROGRAM OF MULTIPLE MICRONUTRIENTS SUPPLEMENTATION IN SIDOARJO DISTRICT OF EAST JAVA, INDONESIA

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BACKGROUND AND OBJECTIVES

Multiple Micronutrients Supplement (MMS) currently has been widely used in Asian and African countries. In Indonesia, the use of MMS is still in context of implementation research to prepare in transitioning from IFA to MMS. The objective of this study aims to evaluate the implementation of the pilot program of MMS among pregnant women.

METHODS

This is a formative evaluation study, was conducted using explanatory sequential QUAL→QUAN mix method. Qualitative approach was provided the information about the implementation of MMS program including input, process and output (the coverage and adherence of MMS), and quantitative approach was to provided the data of acceptance and adherence of MMS consumption among pregnant women. This research was conducted in Sidoarjo Districts, East Java Province, Indonesia. There were 3 samples consist of staff of district health office, sub-districts level, and pregnant women in village level. This difference of targets was intended to explore the role of each level in MMS program implementation. Qualitative data were gathered by FGD among staff of district health office, sub districts level, while the survey was done among pregnant women in village level. Qualitative data form FGD was analysed using content analysis, narrative analysis. Data survey was performed as cross table and percentage.

RESULTS

The implementation of MMS pilot program in Sidoarjo District was conducted since 2017 under initiation of District Health Office (DHO) following with strong commitment by the head of DHO and Head of Public Health Division, strengthened by local regulation on maternal and child health. Budget support was quite good, to provide MMS supply. MMS supply only cover about 65.8% of population of pregnant women. Supply of IFA remain consistent, and MMS distribution did not interfere the IFA distribution, because DHO extent the IFA target on adolescent girls. Recording and reporting of MMS distribution embedded in ANC services using “si cantik” application. However, the pilot program still lacks of promotion. Based on data survey, the MMS coverage is about 69.1%, because MMS supply only provide 25000 bottles, whereas the total population of pregnant women is about 38000. MMS was distributed either as a single supplement or combine with IFA.

CONCLUSIONS

The acceptance and adherence of MMS consumption among pregnant women was good, because of less side effect, and family support (husband), even their knowledge of MMS benefit remains poor. Most of respondent stated that MMS product was quite stable in odor

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP33_06

FACILITATORS AND BARRIERS TO HEALTHY MERCHANDISING INITIATIVES IN THE FOOD RELIEF SECTOR: A SOUTH AUSTRALIAN QUALITATIVE STUDY

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BACKGROUND AND OBJECTIVES

In economically developed countries, food relief services are indispensable safety nets; however, concerns have grown regarding the nutritional adequacy of foods supplied by third-sector organisations. Evidence-informed behavioural strategies and pricing manipulations have been shown to improve unplanned impulse purchases for healthy food selection. In 2021, researchers successfully adopted a place-based approach by collaborating with Foodbank South Australia and Northern Territory to implement the 3P Pantry Reform Study as part of the Healthy Merchandising Project in two food relief pantries. Understanding the perceptions and experiences of key stakeholders involved in 3P Pantry Reform Study is important in policymaking. However, their perceptions of the implementation challenges remain unknown. Objective: This study sought to explore the facilitators and barriers to implementing healthy merchandising in the food relief pantries of a leading South Australian food relief provider.

METHODS

Purposive sampling identified 13 informants who were deemed integral and familiar with the study. One-to-one, semi-structured interviews were conducted with key stakeholders, including managers (n = 4), frontline pantry employees (n = 4), and volunteers (n = 5). The interview schedule was informed by Kurt Lewin's three-stage model. Interview transcripts were reported using Braun and Clarke's thematic analysis, using inductively coded data from a critical realist ontology.

RESULTS

Facilitators (N =11) and barriers (N = 11) were identified across the four main themes structured as stratified layers of realities: 1) individuals, engagement with pantry operations and intervention; 2) organisational, within the contraints of distribution facilities and capacities; 3) structural, deviating away yet dependent on food rescue; and 4) governance, a food insecure organisation tackling food insecurity.

CONCLUSIONS

Insights from key informants revealed that existing forces and dynamics within and external to the food relief sector must be considered as essential components in the pathways towards nutritious food banking, particularly when considering the viability and uptake of public health strategies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP33_07

BREAST MILK SUBSTITUTES MARKETING ON SOCIAL MEDIA: A SYSTEMATIC SCOPING REVIEW

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BACKGROUND AND OBJECTIVES

Infant feeding decisions significantly impact child health and development. These decisions should be guided by evidence and accurate information rather than influenced by commercial marketing. Digital media has rapidly superseded traditional media for persuasive marketing, and social media marketing may exploit a loophole in the International Code of Marketing of Breast-milk Substitutes. This scoping review aimed to identify and analyse the strategies of breast-milk substitutes (BMS) marketing on social media platforms

METHODS

Six databases were searched: CINAHL, Embase, Medline, Scopus, and two Cochrane databases. Backward and forward citation hand-searching was undertaken. Grey literature that may have been excluded from other reviews was included in this analysis. The search was limited to English language articles published from January 2003 to April 2024.

RESULTS

20,425 and 91 articles were identified through database and hand searches, respectively. After removing duplicates and screening abstracts, 497 full-text articles were reviewed, with 70 included in the analysis. The study revealed extensive BMS marketing strategies, specifically for social media platforms. The most prominent strategies identified on social media included: user engagement features, promotion by social media influencers and bloggers, peer influence, digital marketing tracking, and live streaming or live interaction. Facebook and Instagram were the most popular social media platforms for BMS marketing. The top three companies marketing their BMS brands on social media were Danone, Nestle, and Mead Johnson.

CONCLUSIONS

Several transnational companies control the global milk formula market and actively promote BMS on social media. This study highlights the urgent need for coordinated global monitoring and regulatory measures to restrict BMS marketing on social media in order to protect breastfeeding and child health.

CONFLICTS OF INTERESTS

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SOAP33_08

NUDGING FOOD CHOICES IN DUTCH FOOD BANKS: AN INTERVIEW STUDY

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BACKGROUND AND OBJECTIVES

This study explored the acceptance of healthy food choice nudges at food banks. The primary aim was to assess how nudges promoting healthier food choices among food bank clients are considered acceptable and feesable through the perspectives of both clients and volunteers.

METHODS

Interviews were conducted with 13 clients and 18 volunteers of two different food banks to gather insights into the feasibility and acceptability of implementing healthy food choice nudges at food banks. All interviews were analyzed using thematic analysis, which identified various themes in both groups (clients and volunteers). The acceptance of nudges was examined across both groups.

RESULTS

Feasibility of nudging was considered moot, due to limited: offer of food items, need for healthy food choices, and language ability among clients. The need for autonomy was stressed, with nudges intended to raise awareness of healthy food choices being viewed as most acceptable.

CONCLUSIONS

Despite the expressed value of healthy nutrition by both volunteers and clients, we conclude that the narrow and inconsistent range of healthy foods on offer make food banks the wrong place for promoting healthy nutrition through nudging.

CONFLICTS OF INTERESTS
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SOAP33_09

EXPOSURE TO FOOD ADDITIVE MIXTURES AND TYPE 2 DIABETES RISK IN THE NUTRINET-SANTÉ COHORT

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BACKGROUND AND OBJECTIVES

The safety assessment of food additives has traditionally focused on individual substances. However, in reality, people are exposed to mixtures of food additives daily. Preliminary experimental data suggest that some of these chemicals, alone and/or in synergy, impact metabolic health. The objective of this study was to investigate for the first time the associations between exposure to mixtures of food additives and type 2 diabetes (T2D) risk in a large French adult cohort.

METHODS

Participants (n=108,643, mean follow-up=7.7y, SD= 4.6, age=42.5y, SD=14.6, 79.2% women) were adults from the French NutriNet-Santé cohort (2009-2023). Dietary intakes were assessed using repeated 24h-dietary records, including industrial food brands. Exposure to food additives was evaluated through multiple food composition databases and laboratory assays. Mixtures were identified through non-negative matrix factorisation, and associations with type 2 diabetes risk were assessed using multi-adjusted Cox models.

RESULTS

1,131 participants were identified with T2D during follow-up. Two out of the five identified food additive mixtures were associated with increased type 2 diabetes risk : the first included modified starches E14XX, pectin E440, guar gum E412, carrageenan E407, polyphosphates E452, potassium sorbate E202, curcumin E100, and xanthan gum E415 (HR =1.08 [1.02-1.15], p=0.006), and the second mixture included citric acid E330, sodium citrates E331, phosphoric acid E338, sulphite ammonia caramel E150d, acesulfame-K E950, aspartame E951, sucralose E955, arabic gum E414, malic acid E296, carnauba wax E903, paprika extract E160c, anthocyanins E163, guar gum E412, and pectin E440 (HR=1.13 [1.08-1.18], p<0.001). Food groups most likely to contain the mixtures associated with type 2 diabetes risk were broth, dairy desserts, fats and sauces, as well as artificially sweetened beverages and sugary drinks, respectively. These associations were not driven by a specific food additive, and several interactions between additives of a same mixture were detected.

CONCLUSIONS

This study revealed positive associations between exposure to two widely consumed food additive mixtures and increased type 2 diabetes risk. Further experimental research is need to depict underlying mechanisms. These findings suggest that potential interaction/synergistic effects of food additives should be considered in safety assessments and they support public health recommendations to limit non-essential additives.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP33_10

CHILD FEEDING PRACTICES AND NUTRITIONAL OUTCOMES OF TWO GEOGRAPHICALLY DIVERSE INDIGENOUS COMMUNITIES OF INDIA

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BACKGROUND AND OBJECTIVES

Role of agroecology in improving nutrition outcomes is well documented [1]. Research is crucial to explore differences in child feeding practices of population groups from different agroecological zones, having access to distinct traditional foods. We conducted a study among children from two indigenous communities, from geographically diverse and different agroecological zones of India, to examine their infant and young child feeding (IYCF) practices, dietary intake and nutritional status. The communities included Gond tribe residing in forest-surrounded villages of Madhya Pradesh (MP) and Garo tribe, residing in Meghalaya, a biodiversity hotspot of India.

METHODS

Study sites included 21 randomly selected villages from Mandla district, MP, and 14 randomly selected villages from West Garo Hills district, Meghalaya. Household surveys elicited information on IYCF practices (n=232 in Gond tribe, n=205 in Garo tribe). Additionally,2-day non-consecutive 24-hour dietary recall and anthropometric assessments (height and weight measurements) were conducted for diet and nutritional status assessment. Data analysis was done in MS Excel and R.

RESULTS

Overall better IYCF practices were demonstrated in Garo children, for early initiation of breastfeeding (95.4% Garo vs 59.4% Gond), colostrum feeding (67.3% Garo vs 44.3% Gond) and pre-lacteal feeding (2.4% Garo vs 6.8% Gond). Exclusive breastfeeding till 6 months was reported in 53.4% and 47.4% Garo and Gond children. Similar to national estimates (23%), 25.6% Garo and 21.1% Gond children consumed minimum diverse diet (≥5 food groups). Less than one-fourth reported minimum adequate diet (18.5% Garo, 12.9% Gond), although higher than national estimate (11%). Most children consumed high fat, salt and sugar foods (83.4% Garo, 73.2% Gond) with one-fifth Garo children (21.6%) consuming sugar-sweetened beverages. Animal-source foods like egg and flesh foods was reported more in Garos than Gonds (42.7% vs 16.3%). In comparison to national estimates (32.1% underweight, 35.5% stunting and 19.3% wasting), lower prevalence of underweight (28.9%), stunting (23.6%) and higher wasting prevalence (28.6%) was observed in Gond children, attributed to consumption of nutritionally inadequate diets.

CONCLUSIONS

This study provides insights into suboptimal diet and nutrition of young indigenous children from diverse agroecological zones of India. Strengthening nutritional outcomes through community-specific foods, grown and accessed as part of rich agro-diversity, is warranted.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP33_12

A GLOBAL ACTION-ORIENTED FRAMEWORK FOR ADOLESCENT NUTRITION

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BACKGROUND AND OBJECTIVES

Optimal nutrition during adolescence is fundamental to growth and development. Yet globally, adolescents experience a triple burden of undernutrition, micronutrient deficiencies and overweight/obesity. Currently, we lack a comprehensive reference framework to improve adolescent nutrition. The aim of this collaborative project between the Global Adolescent Nutrition Network (GANN) and youth partners from Act4Food, was to develop a framework to guide actions and investments to improve global adolescent nutrition.

METHODS

The framework was developed using a multi-step methodology including (1) a review to identify and summarise existing frameworks relevant to adolescent nutrition (10-19 years); (2) Nominal Group Technique (NGT) methodology to achieve consensus on strengths and limitations of available frameworks, and key characteristics of an ideal new framework for adolescent nutrition; (3) stakeholder workshops to co-create the framework; and (4) stakeholder survey to assess the use and applicability of the final framework.

RESULTS

We present a framework that recommends actions to improve adolescent nutrition across four levels: adolescents themselves; households, peers, schools and communities; national systems; and global systems and planetary health. These actions can be tailored to different contexts and are directed at actors, including youth, working on research, programming, policy, and advocacy. Key to this process was the contribution of young people to enable agency and empower change.

CONCLUSIONS

Through a novel youth co-design process, we developed a new framework to guide actions and investments to improve global adolescent nutrition.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP33_13

CHALLENGES IN MONITORING PRENATAL SUPPLEMENTATION WITHIN THE CONTEXT OF ROUTINE ANTENATAL CARE IN INDONESIA

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BACKGROUND AND OBJECTIVES

A key indicator of the prenatal supplementation program in Indonesia has been the percentage of pregnant women (PW) who receive at least 90 tablets of Iron & Folic Acid (IFA). Given low IFA adherence, as shown in national surveys, the Ministry of Health, in 2020 started assessing adherence to prenatal supplements via a supplement consumption card (or consumption calendar) that was given to women upon their receipt of their supplements. The objective of this study is to examine the feasibility and use of the consumption card within the context of exploring the introduction of multiple micronutrient supplementation (MMS).

METHODS

Implementation research is being conducted to examine the feasibility of introducing MMS in 25 districts in Indonesia, utilizing a mixed METHODSlongitudinal design. The survey with 1941 PW was conducted in eight out of 25 districts. Focus group discussions (FGDs) were conducted in a subset of three districts representing Western, Central, and Eastern regions of the country. In three districts, nine FGDs were conducted in health centers involving 75 midwives and included questions related to the feasibility and use of the consumption control card. Thematic analysis was conducted.

RESULTS

From the PW survey, only 57.6% of women always/often filled out the control card after taking MMS. Nearly 10% of PW had never filled out the control card. This result is in line with the qualitative findings. From the FGDs, midwives informed that only some PW use the control cards to document their MMS consumption. Overall, midwives reported that not all PW use or bring the consumption card to their ANC visits. Key themes for not using or bringing the card included: 1) midwives not instructing PW to bring the card to ANC visits; 2) PW forgetting to bring the card to their ANC visits; and 3) the card was lost/damaged. In addition, midwives varied across districts in their responses, reporting regular use and sharing of the card, inconsistent use or sharing of cards, or inappropriate use or sharing (i.e., perceptions that women falsely reported taking tablets on their cards). Concerning the latter, some midwives felt that the supplement packaging (e.g., use of bottle) hindered their ability to count remaining tablets and validate PW's recording on the consumption card.

CONCLUSIONS

Monitoring prenatal supplementation by midwives remains challenging and continued efforts are needed to strengthen ANC monitoring of prenatal supplement adherence, including strengthening the use and sharing of MMS consumption records by PW.

CONFLICTS OF INTERESTS

Kristen Hurley: Funding and Materials for the study described in this presentation were provided by the Kirk Humanitarian Foundation and Vitamin Angel Alliance. Dr. Hurley was also a paid consultant (technical advisor) to the Kirk Humanitarian Foundation and has received funding from Vitamin Angels to provide technical

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oversight to programs team. These arrangements have been reviewed and approved by the Johns Hopkins University in accordance with its conflict of interest policies.

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SOAP33_15

LOW OR HIGH DIETARY SWEET TASTE EXPOSURE DO NOT AFFECT SWEET TASTE LIKING OR BODY WEIGHT

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BACKGROUND AND OBJECTIVES
Humans love sweet taste (1). Intuition suggests we may love it too much, and that it RESULTS in excessive consumption and high energy intake (2). Authoritative public health agencies, such as the WHO, follow the reasoning: more frequent exposure to sweet taste increases preference for sweetness, which leads to greater sugar and calorie intake and, eventually, leads to higher body weight (3). However, none of these steps have been confirmed with experimental data (4,5,6).
METHODS

A large-scale 6 months, Randomized, Clinical Trial with 180 adults and 3 experimental groups: higher, regular and lower dietary sweetness exposure. Primary outcome was sweet taste preferences; sweet taste perception, energy intake, body weight and several biomarkers for diabetes and cardiovascular disease were secondairy outcomes.

The full design of the trial has been pubslished previously (7), preregistered at clinicaltrials.gov NCT04497974: Sweet Tooth: Nature or Nurture? and had medical ethical approval: NL72134.081.19.

RESULTS

A higher/lower dietary exposure to sweet taste did not lead to higher/lower sweet taste preferences, changes in perception, energy intakes, body weight or biomarkers for diabetes and cardiovascular disease. Subjects also spontaneously returned to baseline levels of sweet food intake at 1 and 4 months follow up.

CONCLUSIONS

Our findings directly contradict the assumptions made by many public health agencies, and suggest that, while overweight remains a global public health concern, excess energy intake is unlikely to be affected by advice to reduce our exposure to, or intakes of, sweet taste. Dietary recommendations to avoid energy overconsumption should instead focus on effective evidence-based strategies, such as, reducing the energy density of food and drinks, limiting portion sizes, and avoiding foods with a high energy intake rate such as sugar-sweetened beverages.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 36 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP36_01

WHY DO WOMEN CHOOSE TO USE COMMERCIAL MILK FORMULA? A WHO MULTI-COUNTRY MARKET RESEARCH STUDY OF WOMEN'S EXPOSURE TO COMMERCIAL MILK FORMULA MARKETING

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BACKGROUND AND OBJECTIVES

Marketing of commercial milk formula (CMF) is a well-resourced strategic effort by CMF companies to shape societal attitudes and practices towards infant feeding to promote CMF and, as a consequence, undermines breastfeeding. CMF marketing continues despite legislation in many countries partially aligned with the provisions of the International Code of Marketing of Breast-milk Substitutes (the Code).

METHODS

A cross-sectional survey was conducted across seven countries: Bangladesh; Mexico; Morocco; Nigeria; South Africa; the United Kingdom (UK); and Viet Nam; to explore the extent and nature of CMF marketing. A market-research methodology used convenience sampling of women stratified by infant feeding practices and child age. Participants were recruited from hospitals, clinics, markets and shopping malls. In each country, the sample included 300 pregnant women, and 750 mothers of children aged < 18 months (150 mothers breastfeeding, never feeding CMF; 600 women feeding CMF with or without breastmilk). Questionnaires were administered on tablets by trained field workers.

RESULTS

Interviews were conducted with 8,528 women between October 2019 and March 2021. Among them, 3,095 of 7,480 respondents (41.3%) reported exposure to CMF marketing, with rates ranging from 3% in Morocco to 92% in Viet Nam. The commonest marketing site in all countries was television, with in-store advertising and print media also common. Social media marketing was uncommon in all countries except the UK.

Health professionals were reported to be the most important influencers among women, both in their choice of CMF feeding and which CMF brand to use. Friends and family were also influential. In addition, although most women agreed with the statement that 'breastfeeding is best for babies' many women perceived CMF as being similar to breastmilk, ranging from 12.9% in Bangladesh to 48.9% in South Africa. Practical considerations such as the belief that CMF feeding is easier than breastfeeding and a better choice for mothers who are returning to work were also important in decisions to feed with CMF.

CONCLUSIONS

The findings underscore how CMF marketing strategically positions products as equivalent to breastmilk and as solutions to normal newborn behaviour, normalizing formula feeding through strategic messaging and promotional activities. Effective legislation to strengthen the Code and public health strategies are urgently needed to protect breastfeeding and empower women with accurate information about infant feeding.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP36_02

STATE OF RESEARCH ON NUTRITION AND FOOD SYSTEM POLICIES AND ACTION PLANS IN SECONDARY CITIES IN LOW- AND MIDDLE-INCOME COUNTRIES: A NARRATIVE REVIEW

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BACKGROUND AND OBJECTIVES

Secondary cities (SC) in low- and middle-income countries (LMICs) are rapidly urbanizing, presenting unique challenges and opportunities for addressing malnutrition and improving food systems. However, research and policy focus have predominantly centered on primary cities, leaving a knowledge gap about the status and impact of nutrition and food system (FSs) policies in SC. This review aims to synthesize the existing literature on this topic, identifying key trends, challenges, and opportunities to inform policy, program development and research gaps.

METHODS

A narrative review was conducted to explore the state of research on nutrition and FSs policies and action plans in SCs in LMICs. Literature published between 2010 and second quarter of 2024 was purposively searched using databases such as PubMed, Scopus, and Web of Science, alongside gray literature from international organizations, including the FAO, WHO, and UNICEF. Studies were included if they focused on nutrition outcomes, FSs, or policy frameworks and action plans specific to SCs. Key themes and evidence were extracted and synthesized to identify research gaps and emerging practices.

RESULTS

The review identified 54 relevant studies and policy reports, majority published after 2015. The findings highlighted significant themes on nutrition and FSs challenges in SCs, SCs as central to FSs transformation, evidence gaps on policy elaboration on nutrition and FS, and knowledge, interventions and recommendations available on how to shape better nutrition, FSs and environment. Malnutrition both under and over remains a major public health concern specifically in SC in LMICs aggravated by rapid urbanization, climate crisis and FSs disturbances. Policies and plans are pivotal in creating a healthier urban FSs. However, policy research related to this were conducted most in high-income countries of the global north with concentration in capital cities, and very limited for SCs. Nutrition and FSs policies and action plans at the city level might be present however quality of implementation is questionable and research gaps on this were identified in several literature.

CONCLUSIONS

The review underscores the urgent need for more research and tailored policy interventions focused on SCs in LMICs. SCs are pivotal to achieving equitable and sustainable FSs, yet remain underrepresented in current research and policy discussions. Utilizing multisectoral collaboration is a first step toward FSs transformation and tackling malnutrition issues through effective governance of urban FSs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP36_03

NUTRI-SCORE IN THE NETHERLANDS: HOW TO ALIGN WITH NATIONAL FOOD-BASED DIETARY GUIDELINES AND TARGETS FOR PRODUCT IMPROVEMENT

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BACKGROUND AND OBJECTIVES

Since 2024, Nutri-Score is the official front-of-pack nutrition label (FOPNL) in the Netherlands. Despite improvements to its nutrient profiling model (NPM), criticism persists. The Nutri-Score NPM is not fully aligned with Dutch Food-Based Dietary Guidelines (Wheel of Five, WoF) and allows for excessive additions of salt or sugar in processed vegetables and fruits. This study aims to develop an alternative NPM for the Nutri-Score FOPNL that is more consistent with National Dietary Guidelines.

METHODS

A product-category-specific NPM was developed to replace the across-the-board Nutri-Score NPM. Criteria from the WoF and the Dutch Targets for Product Improvement were integrated with the Choices 5-level criteria to create an alternative NPM. To evaluate the alternative and Nutri-Score NPM with Dutch food composition data, the percentage of products labeled A/B (i.e. healthier options) and the percentage of products that align with WoF were calculated.

RESULTS

Compared to Nutri-Score NPM, the alternative NPM assigned fewer products to label A/B (table 1). The alternative NPM showed better alignment with WoF than Nutri-Score NPM for processed vegetables (2-fold improvement) and fruits (1.4-fold improvement). Products labeled A/B under the alternative NPM had 45% lower salt levels in processed vegetables and 33% reduced sugar content in processed fruits compared to Nutri-Score NPM.

Table 1. Percentage of products compliant with WoF, percentage of products with label A/B and percentage alignment with WoF for alternative and Nutri-Score NPM.

Product group	WoF	Alternative NPM		Nutri-Score NPM	
	compliant (%)	label A/B (%)	alignment WoF (%)	label A/B (%)	alignment WoF (%)
Processed vegetables (n=52)	19	42	61	88	31
Processed fruit (n=48)	52	17	60	69	42
Processed beans & legumes (n=25)	92	96	88	100	92

CONCLUSIONS

This preliminary analysis illustrates that it is possible to support the Nutri-Score FOPNL with an alternative product-category-specific NPM that is stricter and better aligned with Dutch Food-Based Dietary guidelines. This analysis will be expanded to other product groups.

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CONFLICTS OF INTERESTS

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SOAP36_08

IMPACT OF A COMPLEMENTARY FEEDING PROGRAM ON THE QUALITY OF LIFE OF OLDER PEOPLE

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BACKGROUND AND OBJECTIVES

Background: The world's population is aging rapidly, this is happening due to the combination of different factors: health policies, changes in mortality and birth rates, and migration processes. Aging is a natural process in which a series of changes occur, depending on the speed at which these changes occur, they can even affect people's quality of life (QoL). The WHO defines QoL as the individual sees perception of life, goals, expectations, standards, and concerns. The Complementary Food Program for the Elderly is a set of activities for the distribution of fortified foods to older people in Primary Health Care establishments, this plays an important role in the health of the elderly people. **Objective:** To analyze the impact of a complementary food program on the quality of life of older people.

METHODS

A cross-sectional study was conducted in community dwelling eldery people using non-probabilistic sampling. We evaluated self-perception of QoL and adherence to the complementary feeding program. The RESULTS are presented as n(%) and the Chi-square test was performed to establish the association between the variables. The analyses were performed using STATA 15.1 software.

RESULTS

444 elderly people participated in the study, 73.87% are women with an average age of 77±3 years. 51.35% self-perceive their health as good. 40.54% of the sample withdrew from the program, of them 50% would change something about the products and 100% would recommend the products. The QoL RESULTS are as follows: 77.03% consider their QoL to be good, 20.05% consider it to be average and 2.93% to be poor. When asked if they consider that the complementary feeding program has improved their quality of life, 60.65% of the sample answered yes, with statistical differences between women and men 54.6% vs 79.25% respectively $p<0.001$.

CONCLUSIONS

We can conclude that there is low adherence to the complementary feeding program. However, a greater proportion of men who consume the foods of the program consider that it has a positive impact on their quality of life. It is necessary to explore the reasons for the low adherence to the complementary feeding program.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP36_09

RESOURCES FOR CARE IN CAREGIVER AND CHILD NUTRITION RESEARCH, PROGRAMS, AND POLICY: ANALYZING AND REFLECTING ON 25 YEARS OF EVIDENCE AND APPLICATION

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BACKGROUND AND OBJECTIVES

Adequate care was first highlighted as an underlying determinant of infant and child growth, development, and survival in the 1990 UNICEF conceptual framework for malnutrition. Care refers to behaviors that affect child nutrition, health, and development.

In 1999, Engle, Menon, and Haddad published the seminal "Care and Nutrition: Concepts and Measurement" (Engle et al.) article, adding Resources for Care as another determinant to the UNICEF framework. Resources for Care are resources that caregivers need to draw upon that are linked to their own physical and psychological well-being and sense of self to practice nurturing care and participate in nutrition activities. Engle et al. identified six categories of Resources for Care: 1) caregiver education, knowledge, and beliefs; 2) physical health and nutritional status; 3) mental health and self-confidence; 4) autonomy and control over resources; 5) reasonable workloads and sufficient time; and 6) social support. In the 25 years since publication, the concept of Resources for Care has been widely recognized and used globally, but a systematic investigation of its application and impact was needed.

METHODS

A citation analysis was conducted to 1) understand how Engle et al. and the concept of Resources for Care have been applied to nutrition and related research and programs, and 2) examine how the article has influenced scholarship across disciplines.

RESULTS

From a total of 696 citations identified, 264 peer-reviewed articles, books, reports, and theses from researchers across multiple geographic regions and disciplines (e.g., agriculture, anthropology, child development, economics, education, gender, nutrition, political science, public health) met inclusion criteria and were analyzed. The most frequent nutrition topics were growth and nutritional status, followed by breastfeeding and complementary feeding. Thirty-three (12.5%) of the publications reported on interventions and 33 (12.5%) included the Engle et al. figure. How the concept of Resources for Care was used to guide the research and/or inform a framework or theory was summarized. For publications conceptually grounded in Resources for Care, adaptations to the original framework, which Resources for Care were included, and related measures and outcomes were documented.

CONCLUSIONS

"Care and Nutrition: Concepts and Measurement" continues to be cited in the global nutrition literature. Use and measurement of Resources for Care advanced in some contexts. Research and program recommendations, including improving standardization and measurement of caregiver resource constructs for comparison across contexts, will be presented.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP36_10

NUTRITION EDUCATION IMPROVES THE DIET QUALITY OF ADOLESCENTS IN FOOD-INSECURE HOUSEHOLDS (STUDY IN POST-DISASTER AREAS OF INDONESIA)

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BACKGROUND AND OBJECTIVES

Adolescents' diets can be worse in post-disaster areas due to food insecurity. Nutrition education is a method often used to change eating behaviors, but its effectiveness in improving the diet quality of food-insecure adolescents has not been extensively researched. This study aims to analyze the impact of nutrition education on improving eating behaviors and its effects on the diet quality of adolescents in post-disaster areas.

METHODS

The research was conducted in disaster-affected areas in Indonesia from August 2021 to August 2022. The Cluster Randomized Controlled Trial (CRCT) design was used, with random allocation based on schools. There were 52 and 53 adolescents in the intervention and control groups, respectively. The intervention group received a combination of nutrition education at school and home visits for three months. Each group received food coupons that could be exchanged for groceries. Follow-up measurements were conducted three months after the intervention was completed.

RESULTS

The combination of nutrition education in schools and home visits had a significant positive impact on behavioral mediators such as attitudes, behavioral control, intentions, and vegetable eating habits among adolescents ($p<0.05$). Also, it resulted in an improvement in the diet quality ($p<0.05$). This condition persisted three months after the intervention, except for the scores of behavioral control and diet quality, which decreased although their values remained above the pre-intervention scores.

CONCLUSIONS

Nutrition education interventions designed based on behavior change theory, multi-strategy, and multi-component approaches can improve the diet quality of adolescents in vulnerable households in post-disaster areas.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP36_12

MICRONUTRIENT DEFICIENCIES AND RISK FACTORS AMONG SCHOOL-AGED CHILDREN: A REPRESENTATIVE CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

In the context of nutritional transition and significant shifts in lifestyle and diet, the Middle East and North Africa are experiencing a notable rise in overnutrition, while micronutrient deficiencies persist. These micronutrient deficiencies, particularly vitamin A (VAD) and iron deficiencies (ID), remain significant public health concerns among school-aged children. This study aims to analyze the extent, severity, and socio-demographic factors influencing VAD and ID among school-aged children in Greater Tunis.

METHODS

A stratified random sample of 50 primary schools (public and private) in urban Tunisia was selected, with 50 children randomly chosen from grades 4–6 in each school. Between January 2020 and June 2021, a cross-sectional study was conducted among 2465 children aged 8–11 years (50.3% girls, 49.7% boys) and their parents (n = 2256). Data were collected through surveys, dietary recalls, and measurements of anthropometric and biological parameters, including hemoglobin (Hb), ferritin (FER), retinol-binding protein (RBP), C-reactive protein (CRP), and alpha-1-acid glycoprotein (AGP) using a combined sandwich ELISA method. Adjustments for inflammation using Thurnham's method provided corrected estimates of ferritin and RBP levels. Multivariate logistic regression explored associations between socioeconomic and demographic factors and anemia, ID, and VAD.

RESULTS

The proportions of schoolchildren with anemia (based on WHO criteria), ID (serum ferritin < 15.0 µg/l), and iron-deficiency anemia (concurrent ID and anemia) were 5.9%, 22.4%, and 1.9%, respectively, with ID being more prevalent among girls (25.3%) compared to boys (19.5%). The mean RBP level was 1.02±0.007 µmol/l, and 6.7% of children exhibited levels below 0.70 µmol/l, the threshold for VAD, with a higher prevalence in boys (7.8%) than girls (5.6%). Mother's education level significantly influences micronutrient deficiencies in children, especially girls. Children of mothers with secondary education had a lower risk of iron deficiency (OR = 0.6, 95% CI [0.43-0.91]) but a higher likelihood of vitamin A deficiency (OR = 1.5, 95% CI [0.86-2.53]) compared to those with university-educated mothers. Socioeconomic factors significantly influenced deficiencies, with children from lower wealth tertiles having a higher adjusted prevalence of ID (21.8%) and VAD (7.1%).

CONCLUSIONS

This study reveals that in a context with documented increases in overweight, micronutrient deficiencies still persist among schoolchildren in urban Tunis, with disparities by sex, maternal education, and socioeconomic status.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP36_13

VILLAGE LEVEL TREATMENT OF ACUTE MALNUTRITION IN SOMALILAND USING ICCM PLUS: THE SETIPLUS TRIAL

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BACKGROUND AND OBJECTIVES

In Somaliland, a 2019 analysis of SAM treatment coverage found that that less than 1 in 5 children with SAM was enrolled in treatment. Physical access to healthcare facilities is one of the biggest issues families face when seeking care. We hypothesised that integrating simplified combined approach for treatment of acute malnutrition into existing community case management platforms (iCCM+) would lead to greater access to effective acute malnutrition treatment compared to facility-based treatment.

METHODS

We conducted a cluster randomised controlled trial in 37 villages. We collected baseline and endline data and followed a cohort of active cases over 12 months (March 2024-February 2025). The trial intervention was the provision of treatment at village-level for uncomplicated acute malnutrition, for children 6-59 months of age, by community health workers, known locally as Family Health Workers (FHW). Treatment followed a simplified treatment package. Data was collected from households using Open Data Kit on Android mobiles, and records from FHW and health facilities were photographed and data manually entered into Excel. We used STATA to perform data analysis and hypotheses were tested using multi-level linear and logistic regression models.

RESULTS

We conducted a cluster randomised controlled trial in 37 villages. We collected baseline and endline data and followed a cohort of active cases over 12 months (March 2024-February 2025). The trial intervention was the provision of treatment at village-level for uncomplicated acute malnutrition, for children 6-59 months of age, by community health workers, known locally as Family Health Workers (FHW). Treatment followed a simplified treatment package. Data was collected from households using Open Data Kit on Android mobiles, and records from FHW and health facilities were photographed and data manually entered into Excel. We used STATA to perform data analysis and hypotheses were tested using multi-level linear and logistic regression models.

CONCLUSIONS

RESULTS from the SETiPlus trial will provide important insights into the challenges facing the scale up child malnutrition treatment using the iCCM platform in this setting. The findings will provide evidence to help inform the ongoing development of WHO operational guidelines.

CONFLICTS OF INTERESTS

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SOAP36_14

INFLUENCE OF SOCIO-ECONOMIC DETERMINANTS AND FOOD INSECURITY ON FREQUENCY OF AWAY FROM HOME CONSUMPTION AMONG STUDENTS FROM FRENCH OVERSEAS REGIONS AFTER RELOCATION TO MAINLAND FRANCE

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BACKGROUND AND OBJECTIVES

Given their vulnerability, understanding students' eating habits is essential. Students from the French overseas regions (FOR) who have relocated to mainland France (MF) for their studies experience a sudden change in their food environment that may lead to unhealthy food behaviors. The aim of this work is to evaluate the associations between the frequency of food away from home consumption (FAHC) including on-campus university cafeteria, and the socio-economic determinants and food insecurity (FI).

METHODS

In 2024, a cross-sectional survey (n=306) was conducted among students born in one of the five FOR and were studying in the MF, using a quota sampling method. Participants were asked to complete an online questionnaire about their food consumption and food purchasing practices. FCAH was assessed with the frequency of use of university cafeteria (UC) that provide more affordable food services, and fast-food (FF) or traditional (TR) restaurants. FI was measured using the 6-items US. Household Food Security Survey Module. Multinomial logistic regression models adjusted on individual-level covariates were used to evaluate associations between FAHC and socio-economic determinants and FI.

RESULTS

More than half of students never eating at UC. Students who reported visiting the UC several times a week were more likely to be men (OR=2.3, 95% IC: 1.1-4.9), to have a scholarship (OR=3.7, 95% IC: 1.9-7.5) and to live in university accommodation (OR=3.0, 95% IC: 1.5-5.9). 55% of students reported going to FF at least once a week. Those who visited FF at least one a week were less likely to live in university accommodation (OR=0.4, 95% IC: 0.2-0.9) and to be food insecure (OR=0.4, 95% IC: 0.2-0.9). More than half of students reported eating in a TR at least once a week. Those who declared going several times a week were more likely to be men (OR=2.8, 95% IC: 1.1-7.5). Age, level of education and income did not seem to be associated with the use of UC, FF and TR.

CONCLUSIONS

Sex and housing and study conditions appear to significantly influence away from home consumption, suggesting the role of food preparation practices, equipment and food environment as mediating factors in these relationships. Further research is needed to better understand the role of food environment and the affordability on the frequency of food consumed away from home, especially regarding UC an FF.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP36_15

DIETARY DIVERSITY, HOUSEHOLD FOOD INSECURITY AND CHILD- AND CAREGIVER ALCOHOL CONSUMPTION ON SCHOOL-AGED CHILDREN'S NUTRITIONAL STATUS IN UGANDA: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

The nutritional status of children in the primary school age period has received limited attention. This study, embedded in the "TREAT C-AUD - Child Alcohol Use Disorder in Eastern Uganda: screening, diagnostics, risk factors and handling of children drinking alcohol", investigated the relationship of child dietary diversity, household food insecurity and child- and caregiver alcohol consumption on the nutritional status of children aged 6 to 13 years in Mbale District, Uganda.

METHODS

A two-stage proportionate-to-size sampling procedure was carried out in Mbale District, including 20 sub-counties and 114 selected clusters (villages) where 1857 households were systematically sampled for caregiver-child interviews including all children 6-13 years. This study included a sub-set of children with anthropometric measurements. Dietary diversity scores (DDS) were computed based on self-reported consumption of nine food groups as defined by the Food- and Agriculture Organisation. A household food insecurity (HFI) scale was created based on a modified version of the Household Food Insecurity Access Scale including 6 items. Child and caregiver alcohol consumption included self-reported drinking during the past 30 days. The z-scores for BMI-for-age (BAZ) and height-for-age (HAZ) were employed to assess nutritional status according to WHO reference values. Linear regression adjusting for household clustering was done and the final model also adjusted for child age and sex.

RESULTS

A total of 1,566 children, 51.3% boys, were included in the analysis. The mean age was 9.5 years (95% CI 9.4-9.6). The prevalence of underweight (BAZ < -2) and stunting (HAZ < -2) were 8.3% (95% CI 7.0% to 9.8%) and 49% (95% CI 46% to 51%), respectively. The mean DDS was 4.2 (standard deviation 2.0). Alcohol consumption was reported by 21.1% (95% CI 19.2% to 23.2%) of children and 27.5% (95% CI 25.4% to 29.8%) of caregivers, both groups usually drinking 1 and 2 units each time. There was no association between DDS, HFI, and child- and caregiver alcohol consumption on HAZ, but a positive association was found between DDS and BAZ (Adj ß: 0.04; 95% CI 0.02 to 0.08). A negative association between child alcohol consumption and BAZ was only seen in the bivariable model (ß: -0.19, 95% CI -0.38 to -0.01). HFI and caregiver alcohol consumption were not found related to BAZ.

CONCLUSIONS

There were low dietary diversity and high alcohol consumption among 6-13 year old children in Mbale, Uganda, that affected children's nutrition status. Further research to explore the complex interplay of dietary patterns, substance use, and health determinants is needed in this age group.

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CONFLICTS OF INTERESTS

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SOAP 39 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP39_01

WHEY PROTEIN SUPPLEMENTATION USE AMONG UK RECREATIONAL EXERCISERS: INSIGHTS INTO SUPPLEMENT TYPES, DOSE, EXERCISE HABITS AND DIETARY GOALS

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BACKGROUND AND OBJECTIVES

Whey protein (WP) supplements derived from cow's milk are rich in branched-chain amino acids (BCAA). Although a large body of evidence supports the positive health benefits of WP, some studies have reported diets high in BCAA are associated with type 2 diabetes risk. WP is marketed to people who exercise for muscle building, to improve recovery from exercise and aid with weight management. Despite increasing annual sales of WP, there is little evidence on how and why they are used by UK recreational exercisers. The objective of this research was to address this knowledge gap.

METHODS

An online survey, aimed at UK adults who exercise was developed. Participants who used WP were asked questions about the amount, frequency, timing, goals and perceived effects of WP use. The survey also collected demographic data including sex, age, occupation and income, as well dietary and exercise habits. The survey was open for 11 weeks and was shared primarily via online fitness groups and through gym networks. Data were analysed using regression (binary/multinomial logistic or linear as appropriate).

RESULTS

Of the 688 survey responses, 46% used WP. Sex (OR 0.551, 95% CI 0.389 - 0.781, $p<0.001$), age (OR 0.974, 95% CI 0.961-0.967, $p<0.001$), body mass index (OR 1.045, 95% CI 1.005-1.087, $p=0.026$), exercise type and duration (OR 1.002, 95% CI 1.001- 1.002, $p<0.001$) were significantly associated with higher odds of using WP. The most common supplement type was WP powder (57%), followed by WP bars (26%) and ready-to-drink shakes (13%). The primary goal for WP use was muscle building (52%) and weight management (17%). Relative to females, a greater proportion of males used WP for muscle building, whereas use for weight management was lower. Most participants had used WP for more than 2 years (57%) and took WP after exercise (61%). Males consumed larger servings with more frequency (25-50 g, 4.5-10 times per week) than females (25-30 g, 3-7 times per week). Reported daily protein intake goals in both sexes far exceed current UK protein intake recommendations. Most WP users indicated they did not follow any specific diet (48%) with high-protein diet being the next most common response (12%).

CONCLUSIONS

These findings offer valuable insights into the demographics and behaviours of WP users in the UK, which will help inform future research into the impact of high dietary BCAA intake from WP on metabolic health.

CONFLICTS OF INTERESTS

DIG has received travel expenses and honoraria in connection with lectures and meetings from the Dairy Council (now Dairy UK), Dutch Dairy Association, European Dairy Association, and the International Dairy Federation.

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He has also been a consultant to BioCC OÜ the Estonian Bio-Competence Centre of Healthy Dairy Products, and to the Dairy Council on fats in dairy products and cardiometabolic diseases.JAL is Deputy Chair of the UK government's Scientific Advisory Committee on Nutrition (SACN); however, this represents independent work and is not related to any direct activity by the SACN committee.

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SOAP39_02

EFFECTIVENESS OF MULTI-MICRONUTRIENT POWDERS AND HEALTH EDUCATION COMMUNICATION ON BODY COMPOSITION IN VIETNAMESE INFANTS AGED 6 - 11 MONTHS

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BACKGROUND AND OBJECTIVES

Changes in the body composition of children help open up knowledge about nutritional needs as well as functional changes after nutritional intervention in children. This study was conducted to evaluate the effect of multiple micronutrient powders and health education communication on body composition in Vietnamese infants 6-11 months old.

METHODS

360 infants 6-11 months old participated in the intervention, divided into 2 groups according to anthropometric indicators, age in months and gender. The intervention group supplemented the multi-micronutrient package MNPs Bibomix, 1 package/1 day; 5 packages/1 week, consisting of 15 vitamins and minerals, combined with nutrition communication, the control group used a placebo package and nutrition communication, for 12 months. Assessment of body composition (n=138) using deuterium and analysed by Fourier transform infrared spectroscopy (FTIR). Comparison of the difference between the two study groups used generalized multiple regression analysis.

RESULTS

After controlling for pre-intervention confounding factors, the RESULTS show that the increase of average fat free mass (FFM) in the intervention group was 1.25 ± 0.10 kg (SE), the control group was 1.12 ± 0.09 kg, the difference between the two groups was 0.13 kg ($p > 0.05$). After 12 months, the intervention group gained 3.18 ± 0.18 kg (SE), the control group gained 2.86 ± 0.18 kg, the difference between the two groups was 0.32 kg ($p < 0.05$). There is no difference between the intervention and the control group on the average FM after 6 months of intervention. After 12 months, the intervention group increased by 0.72 ± 0.13 kg (SE), the control group increased by 0.79 ± 0.13 kg, the difference between the two groups was -0.07 kg ($p > 0.05$). After 12 months, the intervention group decreased by -0.02 ± 1.42 (%) (SE), the control group increased by 0.63 ± 1.29 (%) (SE), the difference between the 2 groups was -0.65% ($p < 0.05$).

CONCLUSIONS

Fortification of multi-micronutrient powders into complementary foods at households combined with counseling on child feeding and care have improved the body composition of children measured by the stable isotope method significant increase in the average FFM of children after 6 months and 12 months in the intervention group compared to the control group. These findings highlight the need for using stable isotope techniques to monitor situations and interventions for promoting infant and young child nutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP39_03

ADHERENCE TO PLANT-BASED DIETARY PATTERNS TOWARDS IMPROVEMENTS IN GLYCAEMIC CONTROL IN A UK PREDIABETIC COHORT ON THE NATIONAL DIABETES PREVENTION PROGRAMME

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BACKGROUND AND OBJECTIVES

This study aimed to assess the impact of adherence to plant-based dietary patterns on glycaemic control among participants that completed the National Diabetes Prevention Programme (NDPP), a targeted behaviour change intervention in the UK. This study also evaluated the programme's effectiveness in altering body composition and its effects on glycaemic control as measured by HbA1c levels.

METHODS

A survey method was employed to collect data from individuals who completed the NDPP. Adherence to an overall plant-based diet index (PDI), healthy plant-based dietary index (hPDI), and unhealthy plant-based diet index (uPDI) were assessed. Correlation and regression models between these dietary index scores and glycaemic control (HbA1c), weight loss, and other body composition measures were analysed. The timeline for these measurements was from baseline (on referral to the NDPP), to at least 9 months (from completion of the NDPP), to 6 months after completion.

RESULTS

Adherence to the hPDI showed significant improvements in glycaemic control ($r=-0.237$, $p=0.042$), whereas the PDI and uPDI were not significant or predicted remission. Weight loss and baseline glucose control were significant predictors of changes in HbA1c ($B=0.206$, $p<0.001$, and $B=0.353$, $p=0.021$, respectively) and post-intervention HbA1c levels ($B=-0.206$, $p<0.001$, and $B = 0.647$, $p<0.001$, respectively). Significant reductions in body weight, waist circumference, and BMI were observed over the 9-month programme (-5.02kg, -5.85cm, and -1.74kg/m2, respectively). Post-intervention, 56.8% of 74 participants achieved remission from prediabetes, with a mean change in HbA1c levels of -2.4mmol/mol.

CONCLUSIONS

Preliminary findings suggest that adherence to a healthy plant-based diet is associated with improved glycaemic control, to a greater extent than adherence to PDI or uPDI indices. Weight loss remains a primary target for diabetes prevention, with an increased focus on consuming healthy plant foods as recommended for optimal prevention of type 2 diabetes. A follow-up survey will be conducted to further investigate and validate these preliminary findings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP39_06

ASSOCIATIONS BETWEEN NIGHT EATING SYNDROME, FOOD ADDICTION AND SLEEP QUALITY: A CROSS-SECTIONAL ANALYSIS

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BACKGROUND AND OBJECTIVES

Night Eating Syndrome (NES) and Food Addiction (FA) are emerging conditions with significant implications for metabolic, psychological and behavioural health. NES is characterized by compulsive nocturnal eating patterns and disrupted sleep cycles, while FA involves a critical inability to regulate food intake, similar to substance addiction. Sleep quality, a nocturnal but essential factor in overall well-being, may serve as a common pathway linking NES and FA and exacerbating their impact on health. Therefore, the aim of this study is to investigate the relationships between NES, FA and sleep quality in a cross-sectional population.

METHODS

This cross-sectional study was conducted with adults aged 18–65 years, recruited through face-to-face interviews. Participants with chronic diseases, pregnancy, or lactation were excluded. Data were collected using the Night Eating Questionnaire (NEQ) to assess NES, the Yale Food Addiction Scale (YFAS) for food addiction, and the Pittsburgh Sleep Quality Index (PSQI) for sleep quality. Demographic and lifestyle information were recorded. Analyses were performed using SPSS, with statistical significance set at $p < 0.05$.

RESULTS

The study was conducted with 600 participants aged 18–65 years, with a mean age of 31.7 ± 13.7 years. The study included 264 males (44.0%) and 336 females (56.0%), with 71.5% of participants never smoking, and 28.5% being current smokers. A multiple linear regression model was used to assess the effects of age, gender, BMI, smoking status, night eating syndrome, and sleep quality on food addiction. The RESULTS revealed that higher NES scores ($\beta = 0.027$, $p < 0.001$) and poorer sleep quality ($\beta = 0.046$, $p=0.010$) were significant predictors of increased food addiction scores. Specifically, a one-unit increase in NES scores and sleep quality scores increased food addiction scores by 0.046 and 0.027 points, respectively. Age ($p=0.460$), smoking status ($p = 0.491$), gender ($p = 0.665$), and BMI ($p = 0.667$) were not statistically significant predictors.

CONCLUSIONS

This study shows that NES, food addiction, and sleep quality are closely linked and may affect overall health. Addressing these issues together could help improve sleep and eating habits while reducing the risk of food addiction. Future research should explore these connections over time and in different groups to gain a deeper understanding of their impact and improve treatment strategies.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP39_08

THE EFFECTS OF A WHOLE-DIET SWEET TASTE INTERVENTION FOR SIX DAYS ON SUBSEQUENT SWEET TASTE PERCEPTIONS AND SWEET FOOD INTAKE

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BACKGROUND AND OBJECTIVES

Considering associations with the development and maintenance of poor health, the World Health Organisation currently recommends reducing free sugar intakes [1]. To aid with this reduction, one strategy that has been proposed is to reduce consumption of all sweet-tasting foods and beverages, based on a rationale that regular exposure to dietary sweet taste increases preferences for sweet-tasting foods and beverages, including those which contain free sugars [2]. This randomized controlled trial investigated the effects of a whole-diet, sweet taste intervention on subsequent sweet taste perceptions and intakes of other sweet-tasting foods and beverages.

METHODS

A total of 104 adults were randomized to: a) increase their sweet food intake (n = 40), b) decrease their sweet food intake (n = 43), or c) make no dietary change (n = 21), for six consecutive days. Sweet taste perceptions (pleasantness, desire to eat and taste intensity) and sweet food intake as a proportion of total food intake, were measured on day 0 and day 7.

RESULTS

In intention-to-treat analyses, no dietary exposure x time interactions were found for perceived pleasantness (F(2, 101) = 1.32, p = .27, $np2$ = .03), desire to eat (largest F(2, 101) = 2.22, p = .11, $np2$ = .04) or sweet food intakes (largest F = 2.53, p = .09, $np2$ = .05). A significant dietary exposure x time interaction was found for sweet taste intensity (F(2, 101) = 4.13, p = .02, np2 = .08), where participants in the decrease sweet food consumption group reported all foods to taste more sweet after the intervention compared to before ($Mdiff$ = 6mm / 100mm, SE = 2mm). Participants in this group also reported their intervention to be significantly more difficult to adhere to than participants in the other two groups (t(81) = 2.45, p = .02, $Mdiff$ = 14mm / 100mm, SE = 6mm).

CONCLUSIONS

Our findings suggest that dietary exposure to sweet-tasting foods and beverages does not affect the perceived pleasantness, desire to eat or intake of subsequent sweet-tasting foods. These findings contradict the predictions that reducing dietary sweet taste exposure will aid with reducing free sugar intakes.

CONFLICTS OF INTERESTS

ADB:NoneKMA: For work in the area of sweet taste and low-calorie sweeteners, KMA has previously received research funding from Unilever R&D Vlaardingen, NL, ILSI-North America, US, and the International Sweeteners Association, BE. She has current funding from a consortium of the American Beverage Association, Arla Foods, Cargill R&D Centre Europe BVBA, DSM-Firmenich SA, International Sweeteners Association, SinoSweet Co., Ltd, Cosun Nutrition Center and Unilever Foods Innovation Centre Wageningen, and from The Coca Cola Company, US. She has received speaker's expenses from the International Sweeteners Association, BE; PepsiCo, US; ILSI-North America, US; the CBC group, Israel, and EatWell Global.PJR: PJR has received funding for research from Sugar Nutrition UK, provided consultancy services for Coca-Cola Great Britain, and received speaker's fees from the Global Stevia Research Institute, ILSI-Brasil, ILSI-Europe, ILSI-India and the International Sweeteners Association, and other support from industry for travel expenses for workshops and conferences where he presented research on sugar and low-calorie sweeteners.

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SOAP39_09

A CROSS-SECTIONAL ANALYSIS OF THE NUTRITIONAL QUALITY AND PRICES OF INFANT AND TODDLER FOOD AND BEVERAGE PRODUCTS IN THE CANADIAN FOOD SUPPLY

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BACKGROUND AND OBJECTIVES

Proper nutrition is essential for growth and development during infancy and early childhood; however, the healthfulness and cost of commercial infant and toddler food and beverage products (ITPs) have not been documented in Canada. The objective of the study assessed the nutritional quality and prices of ITPs in the Canadian food supply.

METHODS

Using the Food Label Information and Price 2020 database, ITPs intended for children <4-year-olds (n=423) were examined for their energy and nutrient content (per 100 g or mL), the prevalence of products exceeding 'High in' thresholds for nutrient(s)-of-concern (according to Canadian front-of-pack labelling thresholds), and their price (per 100 g or mL).

RESULTS

Median energy level of ITPs was 101 kcal/100 g or mL [IQR: 67, 400], derived primarily from carbohydrates (21.7 g [14.1, 71.4]). Although total and saturated fat (1.2 g [0, 7.1] and 0 g [0, 0], respectively) and sodium (16 mg [4, 100]) levels were low, ITPs were also low in protein (3.6 g [0.8, 10.0]) and iron (0.9 mg [0.4, 6.0]), and high in sugars (10.9 g [5.5, 17.6]). Based on Canadian front-of-pack labelling thresholds, 59% (n=248) of products were 'High in' one or more nutrients-of-concern, particularly sugars (55%, n=234). Prices varied significantly, ranging from $1.32 to $6.95/100 g or mL, with toddler products costing more than those for infants ($3.14 vs. $1.55).

CONCLUSIONS

Overall, the nutritional quality of commercial ITPs in Canada is poor, with many products 'High in' sugars, highlighting the need for healthier, affordable options and public health policies that can support healthier food environments for infants and toddlers.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP39_10

TRENDS AND FACTORS INFLUENCING VITAMIN A SUPPLEMENTATION UPTAKE AMONG TANZANIAN CHILDREN: ANALYSIS OF 2010-2022 DEMOGRAPHIC HEALTH SURVEY DATA

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BACKGROUND AND OBJECTIVES

Vitamin A is crucial for vision, growth, immunity, and reducing mortality from diarrhea and other causes. Despite its importance, vitamin A supplementation (VAS) uptake among children under five in Tanzania remains low, with limited understanding of determinants. This study analyzed Tanzania Demographic and Health Survey (TDHS) data from 2010 to 2022 to assess trends and factors influencing VAS uptake

METHODS

A secondary analysis of TDHS data was conducted on children aged 6–59 months with available VAS data and caregiver information. Logistic regression assessed associations between VAS uptake and sociodemographic factors using STATA 17 software

RESULTS

Data from 5,863 child-caregiver pairs showed that VAS coverage was 61.1% in 2010, declined to 41.3% in 2015/16, and increased to 53.2% in 2022. Factors significantly associated with higher VAS uptake included maternal primary education or higher, high wealth index, urban residence, first birth after 18 years of age, and marital union. Conversely, younger child age (<12 months), more than four under-fives in the household, lack of vitamin A-rich fruit consumption, and missing postnatal visits within the first two months were linked to lower uptake.

CONCLUSIONS

VAS coverage in Tanzania remains suboptimal and is influenced by child and caregiver characteristics. Targeted health education campaigns emphasizing the importance of VAS uptake and addressing barriers such as education, access, and postnatal care are recommended to improve coverage and reduce vitamin A deficiency-related complications

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP39_13

EFFECT OF BUFFALO MILK CONSUMPTION ON THE BIOCHEMICAL INDICES RELATED TO LINEAR GROWTH OF ADOLESCENT FILIPINO SCHOOLGIRLS

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BACKGROUND AND OBJECTIVES

Energy and nutrients in milk such as calcium, phosphorus, and high-quality protein are needed for biological processes including bone development, and for optimal nutrition to support rapid growth during adolescence. Deficiencies in these nutrients can disrupt the synthesis and secretion of insulin-like growth factor 1 (IGF-1), a hormone that promotes bone formation.The study investigated the effect of buffalo milk consumption on the total serum protein, inorganic phosphorus, total serum calcium, and IGF-1 concentrations among schoolgirls.

METHODS

A quasi-experimental study design was employed to evaluate the impact of buffalo milk consumption for 160 days on the biochemical indices of 57 schoolgirls ages 10-12 years old in selected public schools. The buffalo milk used in the study was analyzed in terms of its energy and nutrient content.

RESULTS

The overall mean total serum protein of the participants decreased after the feeding period while the overall mean inorganic phosphorus, total serum calcium, and IGF-1 concentrations increased. This is also true regardless of the linear growth status, except for phosphorus. Moreover, dairy consumption has been associated with increased serum IGF-1, which is a hormone that is important in skeletal growth. Milk-induced changes in IGF-1 contribute to accelerated linear growth. Therefore, the change in calcium and IGF-1 levels in the blood of the subjects in this study implies that milk consumption can improve their bone mass development and the rate of linear growth regardless of their nutritional status.

CONCLUSIONS

The study findings imply that milk consumption can improve the nutrition profile of adolescent schoolgirls, particularly on nutrients that can assist in improving bone mass development and consequently the rate of linear growth.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP39_14

FOOD LITERACY CURRICULUM, STUDENT COMPETENCY, AND TEACHERS' CONFIDENCE IN SRI LANKAN SECONDARY SCHOOLS: GAPS AND RECOMMENDATIONS

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BACKGROUND AND OBJECTIVES

Food literacy is a critical skill that enables individuals to make informed food choices, promoting health and sustainability. This study examined the food literacy curriculum, stakeholder opinions, student competency, and teacher confidence in Sri Lankan secondary schools to identify gaps and recommend improvements.

METHODS
A mixed-METHODSapproach was used combining curriculum analysis, stakeholder interviews, and quantitative surveys. Curriculum analysis involved identifying essential components and conducting curriculum mapping. Stakeholders, including educators, policymakers, and parents, provided qualitative insights. A validated 25-item tool ($\alpha = 0.937$) was used to measure grade 9 and 10 students' food literacy level across knowledge, attitudes, and practices. Teachers' confidence in teaching food literacy was also assessed.
RESULTS
In curriculum analysis, 34 food literacy components identified as essential for school food literacy education. Of these, 31 components were included in the curricula, with an emphasis on knowledge over practical skill building. Stakeholders emphasized integrating practical skills and fostering collaboration among schools, families, and policymakers to drive behavioral changes through food literacy education. Survey RESULTS indicated that 56% of students demonstrated moderate level of food literacy, 26% low levels, and only 18% high levels. The truncated scores (out of 100) were highest in knowledge (78.9), followed by attitudes (75.7), and lowest in practices (57.1), highlighting a significant gap in applying knowledge. Teachers, particularly females, demonstrated high confidence in delivering food literacy, which is influenced by their educational level.
CONCLUSIONS

The current food literacy curriculum offers substantial knowledge but lacks emphasis on practical skills and sustainable behaviors. Students struggle to apply knowledge in practice, while teachers' confidence varies, highlighting the need for targeted interventions. Revising the curriculum to integrate food literacy into core subjects, prioritizing skill-based learning, and improving teacher training are recommended to enhance confidence and effectiveness, ensuring a balanced approach to knowledge, skills, and behavioral change in food literacy education.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP39_15

PREVALENCE OF CHILD UNDER-NUTRITION IN RURAL COASTAL COMMUNITIES

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BACKGROUND AND OBJECTIVES

We report childhood stunting in communities which are surrounded by relatively cheap to almost free marine proteins. Two serial cross-sectional studies were conducted in 2015 in the east coast (n=244) and 2019 on an island off the west coast (n=106) of (location redacted for review). The objective was to determine the prevalence of undernutrition among children and determine adequacy of food intake.

METHODS

Anthropometric assessments were done using standard procedures. Weight-for-age and height-for-age were compared against WHO 2007 growth charts. WHO AnthroPlus was used to determine anthropometric nutritional status. Socio-economic information were gathered using interviewer administered questionnaires. In 2015, dietary intake was measured using 3-day 24-hour recall. In 2019, due to logistical constraints, food intake was measured as diet diversity score (DDS). Consent to participate were obtained from parent of children and children agreed to participate.

RESULTS

The children in both locations were of the same ethnic group and had almost similar food culture. In 2015, prevalence of underweight, i.e., weight-for-age (WFA) <-2SD was 51.0%. Mean WFA was -1.94 ± 0.97 (95%CI: -2.14 to -1.74). Stunting, i.e., height-for-age (HFA) <-2SD was 42.6%. Mean HFA was -1.91 ± 1.01 (95%CI: -2.11 to -1.70). In 2019, underweight was 51.7%. Mean WFA was -2.12 ± 1.13 (95%CI: -2.31 to -1.73). Stunting was 59.4%. Mean HFA was -2.35 ±1.34 (95%CI: -2.69 to -2.00). In comparison, the national survey (redacted for review) of 2019 reported that the national prevalence of underweight was 15.4% and stunting was 12.7%. In 2015, 99.7% of children met or exceeded the recommended protein intake levels. In 2019, 96.2% of children ate fish every day.

CONCLUSIONS

Such differences between national and local prevalence of under-nutrition formed the basis for an on-going qualitative study to elucidate the causes of severe under-nutrition in various rural coastal communities within (location redacted for review). Food intake data suggested dietary intakes were adequate albeit over-reporting is possible. These findings are of public health importance as stunting is irreversible.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 42 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP42_02

EFFECTS OF A CLUSTER-RANDOMIZED, MULTI-SETTING INTERVENTION TO IMPROVE CHILDREN'S DIET, PHYSICAL ACTIVITY, SLEEP AND SCREEN TIME ON CARDIOMETABOLIC RISK MARKERS IN 6-11-YEAR-OLD CHILDREN: THE GENERATION HEALTHY KIDS STUDY

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BACKGROUND AND OBJECTIVES

The prevalence of cardiometabolic risk markers such as elevated blood pressure, an adverse plasma lipid profile, and elevated insulin is increasing along with the increasing prevalence of overweight and obesity among children. Randomized trials have shown that the New Nordic Diet, intake of fish and wholegrains as well as physical activity can have beneficial effects on children's blood pressure, triacylglycerol, cholesterols, and insulin sensitivity. However, the effect of multicomponent interventions has only been investigated in a few studies with inconsistent RESULTS. The present study was a sub-study of the Generation Healthy Kids project; a 2-school-year multi-setting, multi-component intervention focusing on healthy diets, physical activity, sleep, and screen media habits with the aim of promoting healthy weight development among Danish children aged 6-11 years. The aim of the present study was to investigate the effects of the intervention on children's blood pressure and fasting cardiometabolic blood markers at midpoint by the end of the first school year of the intervention.

METHODS

23 schools were cluster-randomized to either the intervention or the control group and a total of 1351 children aged 6-9 years were included in the sample. The main intervention components were 1) a free-of-charge school lunch four days a week focusing on fruits and vegetables, wholegrains, and fish, 2) three weekly 40-minute sessions of organized vigorous physical activity, and 3) three 45-minute teaching sessions for children and a workshop for parents on sleep practices and screen media use. The control schools continued their usual practice. Children's height, weight, waist circumference, resting blood pressure, and resting heart rate were measured at baseline and after 7-8 months. A subset of children (n=399) also had a venous blood sample drawn which was analyzed for fasting triacylglycerol, cholesterols, insulin, and glucose.

RESULTS

Data analysis is ongoing, and the RESULTS will be presented at the IUNS-ICN 2025. We will use linear mixed effects models to test for differences between intervention and control in changes in blood pressure and cardiometabolic blood markers.

CONCLUSIONS

Our hypothesis is that the intervention will have beneficial effects on children's blood pressure (in particular systolic blood pressure), plasma lipid profile and potentially insulin sensitivity and glucose homeostasis.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP42_03

IMPACT OF FOOD INSECURITY ON DIET QUALITY AND NUTRITION STATUS: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

Food insecurity is a growing global issue that significantly affects individuals' access to nutritious food, leading to poor dietary habits and negative health outcomes. This study aimed to evaluate the impact of food insecurity on diet quality and nutrition status.

METHODS

The study was conducted with 385 adult individuals aged 18-65 years (mean age: 32.4±13.6 years; M: 31.9%, F: 68.1%) through face-to-face surveys. Food insecurity was assessed using the Household Food Insecurity Access Scale, and diet quality was calculated using the Healthy Eating Index-2020 (HEI-2020) from 24-hour dietary recall. The researcher measured participants' body weight, height, waist circumference, and neck circumference.

RESULTS

It was determined that 46.0% of the participants were married, 38.2% were employed, 52.2% had a university education or higher, and the mean body mass index (BMI) was 25.9±5.1 kg/m². The food insecurity rate among participants was 41.8%, with the majority experiencing mild food insecurity (88.8%). Food insecure individuals had significantly higher BMI, waist circumference, neck circumference, and waist-to-height ratio ($p<0.05$). Diet quality scores were calculated for participants based on their food consumption records, and it was found that only 10.6% had a good diet quality. Individuals with food insecurity had significantly higher dietary energy, carbohydrate (g), fat (g), and polyunsaturated fatty acid intake, but lower intake of animal protein, total protein, and fiber ($p<0.05$). Those with food security consumed significantly higher amounts of vitamin B1, vitamin B2, niacin, folic acid, vitamin B6, vitamin B12, vitamin C, and vitamin E ($p<0.05$). Food secure individuals also consumed significantly more iron, zinc, magnesium, phosphorus, and potassium ($p<0.01$), whereas sodium intake was not influenced by food security status. In the food insecure group, a higher number of individuals had poor diet quality, while in the food secure group, more individuals had good diet quality. A significant negative correlation between diet quality and food insecurity was also found (r:-0.480,$p<0.001$).

CONCLUSIONS

Food insecurity is associated with poorer diet quality, higher body mass index, and a higher risk of inadequate nutrient intake. Individuals facing food insecurity tend to consume lower quality diets, with specific deficiencies in essential vitamins and minerals. Addressing food insecurity could improve overall diet quality and nutrition in affected populations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP42_04

STUNTING AMONG CHILDREN HIV-EXPOSED AND HIV-FREE IN ESWATINI: A RETROSPECTIVE EVALUATION OF ASSOCIATIONS WITH BIRTH WEIGHT, FEEDING AND CAREGIVING PRACTICES

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BACKGROUND AND OBJECTIVES

There is a need to understand how dietary practices and feeding patterns relate to stunting among children HIV-exposed and HIV-free, while also considering the socio-demographic environment and maternal characteristics. We investigated the associations between infant birth weight, household socio-demographic factors, and dietary and feeding practices with children's stunting at 9 and 18 months. We used secondary data from a study conducted in eSwatini to evaluate neurodevelopmental outcomes after a nurturing care intervention.

METHODS

We used generalized linear mixed models (GLM) with a logit link to characterize the association between stunting and exposures including infant birth weight quartiles, socio-demographics, maternal characteristics, and infant dietary diversity scores (<5,=5,>5). We further tested for moderating effects of dietary factors on the relationship between birthweight and stunting. Generalized structural equation models were used to characterize the direct and indirect associations between the exposures and stunting at 18 months, mediated through stunting at 9 months.

RESULTS

We included 367 children HIV-exposed and HIV-uninfected. Stunting at 9-months was associated with significantly reduced odds among infants in the 3rd and 4th birthweight quartiles [adjusted Odds Ratio (adj OR) 0.24 (0.11,0.55) p-value=0.0001, 0.10(0.03,0.33), p<0.001, respectively]. Evidence of a moderating effect of dietary diversity was limited to a relative decline in the second birthweight quartile. There was a significant increase in stunting prevalence from 9 months (21%) to 18 months (37%), mediated by stunting at 9 months with significant direct and indirect effects of birthweight and dietary diversity on stunting at 18 months.

CONCLUSIONS

In this population of children HIV-exposed and HIV-free, stunting risk increased dramatically from 9 to 18 months of age, reaching a prevalence rate consistent with that of young children throughout eSwatini. The association with birthweight was strong and not significantly moderated by caregiving practices or dietary factors. These findings, along with a suggestive finding of dietary diversity, illustrate the importance of incorporating the social determinants of health into investigations of children HIV-exposed. The findings warrant urgent attention because stunting among young children is associated with poor school performance, and reduced human capital across the life-course.

CONFLICTS OF INTERESTS

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SOAP42_05

VITAMIN B12 SUPPLEMENTATION AND DOSE RESPONSE IN WOMEN OF REPRODUCTIVE AGE AND PREGNANT WOMEN IN TWO DOUBLE-BLIND, RANDOMIZED, CONTROLLED MICRONUTRIENT DOSE RESPONSE (MINDR) TRIALS IN RURAL BANGLADESH

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BACKGROUND AND OBJECTIVES

Antenatal multiple micronutrient supplements (MMS), providing approximately one recommended dietary allowance (RDA) of 15 nutrients, improve birth outcomes but may be insufficient to address deficiencies in micronutrients such as vitamin B12 in undernourished settings with inadequate dietary intake. We are conducting two parallel bioefficacy trials of increasing amounts of multiple micronutrients, including vitamin B12, in women of reproductive age (WRA) and pregnant women (PW) (18-35 years) in rural northern Bangladesh to ascertain the amounts of each nutrient that minimizes deficiency. Here we focus on vitamin B12.

METHODS

The trials are double-blind, placebo-controlled randomized to attain 240 (60 per arm) WRA and PWs each (NCT06081114). Daily doses of micronutrients are provided in a reconstituted powdered drink, including a placebo, along with a balanced energy-protein product containing ~1 RDA of 18 nutrients/serving. Vitamin B12 per arm is 2.6, 6, 12, and 18 µg/d, ~1-7.5x the RDA. Trial duration is 3 and ~6 months for WRA and PW (12-16 weeks gestation to birth), respectively, with biospecimens collected at baseline, midpoint, at/near the end of supplementation, and at 1 month postpartum for PW. Serum B12 is measured by autoanalyzer (Roche Diagnostics) and holo-transcobalamin (HoloTC) by immunoassay (Active B12-ELISA, IBL International). Pharmacokinetic (PK) and pharmacodynamic (PD) analytical approaches will be applied to determine the threshold of intake at which vitamin B12 sufficiency is achieved.

RESULTS

In total, 289 WRA and 354 PW were enrolled, with follow-up visits to conclude in December 2024 and April 2025, respectively. Study arms were balanced across baseline characteristics. Preliminary blinded data (WRA=280, PW=337) on baseline serum B12 show that 12.6% of WRA and 21.5% of PW were B12 insufficient (150 to <220 pmol/L), and 1.9% and 4.2% deficient (<150 pmol/L), respectively. Baseline HoloTC values (WRA=45, PW=133) indicated 8.8% of WRA, but no PW, were B12 deficient (<35 pmol/L). RESULTS of PK and PD models for the complete sample size will be presented at the conference.

CONCLUSIONS

The risk of vitamin B12 deficiency is high among WRA and during pregnancy in LMICs like Bangladesh. Findings from the dose-response trials will guide B12 dosing in MMS products in LMICs, where the risk of vitamin B12 deficiency is high.

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CONFLICTS OF INTERESTS

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SOAP42_06

CHOLINE ALLEVIATES COGNITIVE IMPAIRMENT IN SLEEP-DEPRIVED YOUNG MICE VIA REDUCING NEUROINFLAMMATION AND ALTERING PHOSPHOLIPIDOMIC PROFILE

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BACKGROUND AND OBJECTIVES

Cognitive impairment caused by insufficient sleep is a significant public health concern, particularly in children. This study explores the protective effects of choline supplementation in alleviating sleep deprivation-induced cognitive deficits, with a focus on neuroinflammation, oxidative stress, and alterations in hippocampal phospholipidomic profiles.

METHODS

Chronic sleep deprivation was induced in young mice, followed by choline supplementation (11.36 g/kg). Cognitive function was assessed using Y-maze and novel object recognition tests. Functional connectivity was analyzed with rs-fMRI, and structural integrity was evaluated by DTI. Pathological injury and synaptic plasticity were assessed using electron microscopy and histological staining. Neuroinflammation was assessed through microglial activation and cytokine levels. Oxidative stress markers were measured with LC-MS/MS. Blood-brain barrier integrity was evaluated using Evans Blue dye extravasation and serum brain injury markers. Phospholipidomic profiles were determined by HILIC-MS/MS.

RESULTS

Choline supplementation significantly improves spatial learning ability. Functional MRI RESULTS reveal the hippocampus as a key region affected by sleep deprivation, where choline supplementation notably preserves hippocampal structural integrity and enhanced connectivity. Additionally, choline ameliorates hippocampal pathological injury, reduces blood-brain barrier permeability and serum brain injury biomarkers. Choline also reduces inflammation and oxidative stress biomarkers, and mitigates microglial activation in the hippocampus, which preserves synaptic plasticity. A key finding is the changes of hippocampal phospholipidomic profile along with cognitive function, and a total of 313 phospholipid molecules are identified. Choline increases the levels of total phospholipid and sub-classes (particularly PC), which are strongly correlated with reduced neuroinflammation and oxidative stress biomarkers, as well as improved cognitive outcomes. Furthermore, there are similar findings in some phospholipid molecules such as PC 36:1, PC O-33:0, PC p-38:3, PE 36:3, PE p-42:4 and PS 44:12.

CONCLUSIONS

These findings highlight that choline alleviates cognitive impairment in sleep deprivation via reducing neuroinflammation and oxidative stress as well as altering phospholipidomic profile. This study suggests that choline could develop into functional food or medicine ingredient to prevent and treat cognitive impairment by sleep disturbances, particularly children and adolescents.

CONFLICTS OF INTERESTS

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SOAP42_09

PREVALENCE OF EXCLUSIVE BREASTFEEDING IN RURAL MOTHERS LIVING WITH AND WITHOUT HIV IN LESOTHO

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BACKGROUND AND OBJECTIVES

Exclusive breastfeeding (EBF) rates are low in Lesotho, and lower in mothers living with HIV (MLWH). Breastfeeding is a life-saving intervention to prevent malnutrition (1-8). We compared the prevalence of EBF among MLHIV vs mothers not living with HIV (MnLWH) and further explored the relationship between breastfeeding and its associated factors.

METHODS

A quantitative retrospective, cross-sectional study design with a convenience sampling method was used. Semi-structured questionnaires were used to collect data on sociodemographic and breastfeeding feeding practices of mothers of children aged 6-12 months, attending regular visits at Maseru district clinics in May 2022 in 151 mother-child dyads (MLWH; n=73 and MnLWH: n=78).

RESULTS

All mothers had similar socio-demographic information, with the prevalence of EBF at 40.4%. The MLWH had lower rates of EBF than MnLWH (28.8% vs. 51.3%); p=0.005. Most MLWH introduced complementary feeding from as early as 1-3 months (19.2% vs 9.0%) and more than half of MLWH started giving solids foods from 4-5 months (52.1% vs 39.7); p=0.012. Above a quarter of mothers in this study received EBF support from the health facility, spouse, and other family members. Only 40.4% of the mothers were encouraged to EBF and 70.9% believed that breastmilk was only adequate for the first six months, and a strong positive correlation was found in EBF and mothers' belief MLWH: r=0.5; p<0.001 and MnLWH: r=0.4; p=0.001.

CONCLUSIONS

Despite significant efforts to promote breastfeeding among MLWH in Lesotho, the low EBF rate remains a persistent public health concern, necessitating increased breastfeeding rates through nutrition education, counseling, and support.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP42_10

THE EAT-LANCET REFERENCE DIET: ASSOCIATION BETWEEN DIET QUALITY AND COGNITIVE FUNCTIONING AND DECLINE IN COMMUNITY-DWELLING OLDER ADULTS

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BACKGROUND AND OBJECTIVES

Adherence to higher-quality diets has been linked to better cognitive function in older adults, but limited research exists on the EAT-Lancet diet. This study examined the association between adherence to the EAT-Lancet diet and cognitive function and decline in community-dwelling older adults.

METHODS

Data from 1,371 participants aged 55–99 years from the Longitudinal Aging Study Amsterdam were analyzed. Adherence to the EAT-Lancet diet was assessed in 2014–2015 using a diet quality index based on a 238-item food frequency questionnaire. Cognitive domains—global cognition (MMSE), information processing speed (Coding task), episodic memory (15WT), and executive function (Word Fluency)—were measured every three years (2011–2021) and converted to z-scores. Linear mixed models assessed associations between quintiles of adherence and cognitive function and decline (testing interaction by age), adjusting for demographic and lifestyle factors. Interaction by sex and secondary analyses with the Mediterranean Diet Score and Dutch Healthy Diet index 2015 were also tested.

RESULTS

Higher adherence to the EAT-Lancet diet was associated with better episodic memory (Q5 vs. Q1, β=0.14 (0.01;0.28)) and executive function (Q5, Q2 vs. Q1, β_Q5=0.20 (0.09;0.32)), but not with information processing speed or global cognition. Higher adherence was linked to slower decline in information processing speed (Q5, Q3 vs. Q1, β=0.01 (0.00;0.02)), with no associations for other domains. Comparable findings were observed for the other diet indices.

CONCLUSIONS

Higher adherence to the EAT-Lancet diet is associated with better episodic memory and executive function and slower decline in information processing speed in Dutch older adults.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP42_11

FOOD INSECURITY AND OVERCROWDING: THE CONCURRENCE BETWEEN TWO SOCIAL DETERMINANTS OF HEALTH IN URBAN CHILEAN HOUSEHOLDS

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BACKGROUND AND OBJECTIVES

Food insecurity and inadequate housing are critical social determinants of health in cities, socioeconomic spatial segregation is related with health inequalities. While evidence suggests vulnerable households face elevated risks of both food insecurity and overcrowding, the spatial co-occurrence and sociodemographic patterns of these conditions remain poorly understood.

Objective: to determine the distribution and association of food insecurity and overcrowding prevalence in Chilean households according to social determinants and residence region.

METHODS

Cross-sectional design based on secondary data from the Chilean National Socioeconomic Survey CASEN, 2022. A sample of 72,056 households occupying 70,751 dwellings in 335 communes in the 16 regions of the country was completed, obtaining information on 202,231 people. Used the food insecurity experience scale. Overcrowding is measured as the ratio of people per bedroom (PPB) in a household Critical overcrowding when ≥2.5 (PPB).

RESULTS

Significant higher food insecurity in women (18%) than men (13%); $p < 0.001$. In the same way, overcrowding prevalence was higher in women (4.3%) than men (3.2%). The women, aged 25 -44 years, lowest socioeconomic level, and critical overcrowding have significantly more food insecurity (OR 1.34; OR 0.95; OR 0.75; OR 3.72 respectively). At a regional level, food insecurity prevalence is higher in the Tarapacá region with higher overcrowding prevalence, whereas the Magallanes region is the lowest in both.

https://drive.google.com/file/d/1S_7Jq-AAG_HF2k7W5CRthKHIm3m_AS5H/view?usp=drive_link

CONCLUSIONS

Food insecurity is a persistent public health problem linked to sex, age, socioeconomic status, and overcrowding. Food and housing indicate the necessity of structural changes in urban settings to improve health in more vulnerable populations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP42_13

HIGHER PREVALENCE OF INADEQUATE VITAMIN D INTAKE IN TODDLERS NOT CONSUMING A VITAMIN D SUPPLEMENT

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BACKGROUND AND OBJECTIVES

Vitamin D is required for growth and development, but little is known about its status during early childhood. This study aimed to determine vitamin D intake and status in toddlers.

METHODS

This is a secondary analysis of data from toddlers (n=133) enrolled in a double-blind randomized controlled trial of fatty acid supplementation between ages 1-2 y. Participants were recruited between 2010-2014 (latitude 49°N). Dietary information was collected using a 3-day food record, and supplement use was assessed by questionnaire. Vitamin D intakes (dietary plus supplemental) were compared to the North American Estimated Average Requirement (EAR; 400 IU [10 µg]) and European Adequate Intake (AI; 600 IU [15 µg]) recommendations. Plasma 25-hydroxyvitamin D3 (25OHD) concentrations were quantified by LC–tandem MS; low vitamin D status was defined as <50 nmol/L. Blood sampling was dichotomized by season defined as winter (Sep-Feb) and summer (Mar-Aug). Relationships were determined by adjusted general linear models and logistic regression.

RESULTS

At baseline 61% of the toddlers were male; 92% had normal weight-for-age z-score; 56% attended the study visit during the winter; and 61% were European ethnicity (parent-reported). At age 1 y (n=110) and 2 y (n=86), the top food sources of vitamin D were dairy (73-81%), fish (7-14%), and eggs (4-6%). Vitamin D supplements were consumed by 43% and 48% of the toddlers at age 1 y and 2 y, respectively. Daily median total vitamin D intakes were 317 IU (8 µg) at age 1 y and 288 IU (7 µg) at age 2 y. Intakes <EAR and ≥AI were 61% and 16% at age 1 y and 66% and 23% at 2 y, respectively. There was a higher prevalence of inadequate vitamin D intake (<EAR) in vitamin D supplement non-users compared with users (P≤0.001) at age 1 y (92% [n=63] vs 19% [n=47]) and age 2 y (96% [n=45] vs 34% [n=41]). Overall, mean (SD) plasma 25OHD levels were 60 (18) nmol/L at age 1 y (n=124) and 61 (14) nmol/L at 2 y (n=104). The prevalence of low vitamin D status was 27% at age 1 y and 22% at 2 y. Plasma 25OHD levels did not differ by sex, supplement use, ethnicity, or weight z-score. At age 1 y, there was a higher prevalence of low vitamin D status in the winter compared to summer (39% vs 12%; P<0.001) with greater odds of low vitamin D status in winter (OR=4.53; P=0.001). A positive relationship was found between plasma 25OHD and total vitamin D intakes at age 1 y (P<0.05; adjusted models).

CONCLUSIONS

These findings suggest a high prevalence of inadequate vitamin D intake in toddlers who do not consume a vitamin D supplement, placing them at higher risk for deficiency in winter.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP42_14

IMPACT OF PORTION GUIDANCE ON COMMONLY CONSUMED PACKAGED FOOD TO REDUCE DISCRETIONARY CALORIES AND PUBLIC HEALTH SENSITIVE NUTRIENTS: EVIDENCE FROM THE UNITED KINGDOM AND FRANCE

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BACKGROUND AND OBJECTIVES

Excessive consumption of discretionary food is a global concern linked to obesity prevalence. Providing reference portion sizes and the possible subsequent reduction in portion size holds potential to tackle this issue. Our aim was to evaluate the impact of following newly established global portion values (GPV) (Eldrige et al., 2025) - without altering food choices - on discretionary calorie intake and nutrients of public health concern, using nationally representative datasets from the United Kingdom (NDNS) and France (INCA3).

METHODS

Diet modelling was applied to selected discretionary, energy-dense food categories; portions larger than GPV were substituted with GPV. Nutritional quality and adherence to WHO guidelines were compared before and after substitutions. Linear regressions were conducted to determine if reduction in daily total energy and daily added/free sugar was associated with participants' demographic and anthropometric characteristics.

RESULTS

After substitution, the proportion of daily energy from discretionary foods decreased 3.1% for NDNS (mean ± SD from 15.6 ± 9.8% to 12.5 ± 8.0%, $p<0.001$) and 3.6% for INCA3 (from 16.1 ± 10.7% to 12.5 ± 8.1 %, $p<0.001$) data. Following reference portion guidance for discretionary foods led to diet quality improvements, with a decrease in public health sensitive nutrients (e.g., saturated fat, added sugar, sodium) and a better adherence to WHO dietary guidelines. Older age was associated with a smaller reduction in discretionary calories and added/free sugar.

CONCLUSIONS

Modification of excessive portion sizes without altering food preferences holds promise for decreasing energy intakes and improving intakes of public health sensitive nutrients. Further research is needed to explore the applicability of these findings to other geographical regions and to investigate potential associations with health outcomes.

CONFLICTS OF INTERESTS

LTT, CD, ES, FM, ALE are employees of Nestlé Research. FV and MM received a consultancy fee from Nestlé Research.

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SOAP 45 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP45_02

EXPLORING THE USES AND PERCEPTIONS OF FOOD ENVIRONMENTS ACROSS SOCIOECONOMIC BACKGROUNDS

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BACKGROUND AND OBJECTIVES

Food environments (FEs) are crucial in shaping dietary patterns and the population's health. Evidence suggests significant disparities in food environments between low- and high-socioeconomic neighborhoods. This study compares how individuals from different socioeconomic backgrounds use and perceive their food environments, using the Chilean model of FE as the framework.

METHODS

This qualitative study involved 11 focus groups conducted in two neighborhoods in Santiago, Chile: five in a low socioeconomic status neighborhood (LSN) and six in a high socioeconomic status neighborhood (HSN). Each focus group included 4 to 10 participants over 18 years old. Discussions were audio-recorded, transcribed, and analyzed thematically, organized around the five FEs in the Chilean model: domestic, restaurant, supply, street, and organizational. Informed consent was obtained from all participants before data collection.

RESULTS

Uses and perceptions of the FEs differed according to socioeconomic status. Participants from the HSN approached food environments with a focus on self-care and pleasure, while those from LSNs prioritized economic constraints and basic needs. In the domestic FE, HSN participants shared responsibilities for food-related tasks, whereas in the LSN, these tasks were primarily managed by women. The HSN supply FE offered greater variety, purchasing options, and quality, whereas LSN participants highlighted farmers' markets as essential for accessing affordable and quality food. The restaurant FE in the HSN served as a space for relaxation and social enjoyment, with a wide range of options. In contrast, LSN participants reserved its use for special occasions due to economic limitations. Both groups associate the street FE with exceptional use and hygiene concerns. In the organizational FE, HSN participants prepare meals for work or choose healthy workplace options, while in LSNs, working conditions create more significant barriers to eating adequately. Digital FE (not included in the Chilean model) appeared more frequently in the HSE and younger participants.

CONCLUSIONS

This study reveals socioeconomic disparities in the use and perception of food environments. Therefore, the challenge is improving food environments, especially in low socioeconomic and vulnerable communities.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP45_05

MATERNAL PRENATAL FACTORS AND THEIR RELEVANCE FOR INDICATORS OF CHILD HEALTH MEASURED AT BIRTH

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BACKGROUND AND OBJECTIVES

Maternal exposures may have an impact on their offspring health in the immediate and long-term. We assessed the association between maternal prenatal factors and parameters of child health measured at birth.

METHODS

This cross sectional study collected data on previous pregnancies from 403 women at a Teaching Hospital. Data collected included socio demographics whilst pregnancy and child birth factors were extracted from the maternal health record book. Maternal factors were maternal age at child birth, BMI at first antenatal clinic (ANC) and gestational weight gain (GWG kg). Child health factors were birthweight, APGAR score measured at 1 and 5 minutes and head circumference. Associations between maternal and child factors were analysed using multivariable linear regression models in SPSS.

RESULTS

Mean maternal age was 30.4 ± 5.3, BMI was 27.4 ± 6.3kg/m2, gestational age was 39.0 ± 1.9 weeks whilst GWG was 12.0 ± 5.3kg. Maternal age was associated with birthweight, after adjustment for child's sex and gestational age, ß=0.089, P= 0.039. Maternal age was associated with child's APGAR score at 1 minute, ß=0 .100, P= 0.044 and with child's head circumference, ß=0.136, P =0.004. Maternal BMI was associated with birthweight, ß=0.203, P<0.001, but no association between GWG and birthweight. BMI and GWG were inversely associated with APGAR scores but not significant. No association was observed between BMI and child's head circumference P= 0.06.

CONCLUSIONS

Maternal age, BMI at first ANC and GWG may be relevant determinants of a child's birthweight, APGAR scores and head circumference at birth.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP45_06

ASSOCIATION BETWEEN ADHERENCE TO LIFESTYLE RECOMMENDATIONS AND HEALTH OUTCOMES IN CHILDREN: IMPACT ON OBESITY, ABDOMINAL OBESITY, ATHEROGENIC INDEX, AND INSULIN RESISTANCE

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BACKGROUND AND OBJECTIVES

Diet quality, physical activity, sedentary behaviour and sleep duration have been related to health status in adults and children, but most studies have investigated the relationship of these factors independently, so the aim of this study was to analyze whether a healthier lifestyle is related to better health status in children.

METHODS

A total of 819 Spanish children aged 8 to 13 years were studied. Dietary data (3-day food record), anthropometric data, biochemical parameters, sleep duration and physical activity were collected. The diet was analyzed using the DIAL software. The Healthy Eating Index (HEI-2020) was calculated as an indicator of diet quality. BMI (weight/height2) and z-score BMI were calculated and classified into normal weight and overweight/obesity according to WHO criteria. The waist-to-height ratio was calculated, and a cut-off point of 0.5 was established to determine abdominal obesity. Fasting blood samples were collected to determine serum cholesterol, HDL-c, glucose and insulin, and the atherogenic index (cholesterol/HDL-c) and HOMA-IR for insulin resistance (IR) were calculated with a cut-off point of 3.5 and 3.16, respectively. A physical activity questionnaire was used to collect the number of hours spent in different activities along the day. Children were classified based on the number of recommendations for a healthy lifestyle they complied with: moderate-to-vigorous physical activity (≥ 1 h/day), screen time (≤ 2 h/day), sleep (9-11 h/day) and HEI-2020 (> 60 points). Logistic regression models, adjusted for sex and age, were used for statistical analysis.

RESULTS

38.95% of the sample had a good lifestyle (meeting 3-4 recommendations) with no differences between the two sexes, and 5.74% did not achieve any recommendations. Having a worse lifestyle (< 3 recommendations) was significantly associated with a higher risk of abdominal obesity, atherogenicity and IR [OR (IC 95%): 1.42 (1.01-2.00), 1.57 (1.05-2.35) and 3.71 (1.54-8.97), $p < 0.05$, respectively) but was not associated with overweight/obesity. Analysis by sex showed an association with atherogenicity in boys and IR in girls.

CONCLUSIONS

A poorer lifestyle was related to poorer health status data such as abdominal obesity, atherogenicity or insulin resistance. Programs to improve health status should address lifestyle as a whole.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP45_07

RELATION BETWEEN DIETARY QUALITY AND SERUM LPS IN PREGNANT WOMEN WITH OVERWEIGHT OR OBESITY

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BACKGROUND AND OBJECTIVES

Bacterial lipopolysaccharide (LPS) is a trigger for inflammatory response. Chronic exposure to low levels of LPS may induce systematic low-grade inflammation, which underlines several metabolic disorders, including obesity and type 2 diabetes. Maternal low-grade inflammation may impact intrauterine programming with likely impacts on child and even transgenerational health. High fat diet has been shown to increase serum LPS levels. Whether diet, as whole, during pregnancy have similar implication on serum LSP and further, beyond maternal metabolic health, is not characterized. The objective is to investigate the impact of overall dietary quality on serum LPS levels. Further, whether LPS is related to insulin levels in pregnant women with overweight or obesity was investigated.

METHODS

The study population comprised of 200 pregnant women with overweight/obesity (prepregnancy BMI≥25) at early pregnancy. Dietary quality was analysed by a validated index of diet quality (IDQ, score 1-15, <10 indicate poor (n=124) (1) and ≥ 10 good (n=75)) and by dietary patterns (healthy pattern and less-healthy pattern) (2). Nutrient intakes were analysed from three-day food diaries. LPS activity was measured by a Limulus amebocyte lysate assay coupled with a chromogenic substrate. Insulin was determined by an immunoelectrochemiluminometric assay.

RESULTS

IDQ correlated negatively with LPS when all the women (ρ=-0.141, p=0.047) and women with poor dietary quality (IDQ<10, n=124)(ρ= -0.274, p=0.002) were analysed, whilst no correlation was detected in women with good dietary quality. Instead, intake of carbohydrates (ρ=-0.232, p=0.047) and fibre in grams (ρ=-0.246, p=0.034) associated negatively with LPS in women with good dietary quality. In women with less-healthy dietary pattern (n=99), intake of total energy (ρ=-0.243, p=0.016), protein (ρ=-0.302, p=0.003) and fibre (ρ=-0.267, p=0.008) correlated negatively with LPS. No correlations were detected in women with healthier dietary patterns (n=96). Direct correlation between LPS and insulin was detected when all the women (ρ=0.24, p<0.001) and women with poor dietary quality were analysed (ρ =0.291, p=0.001). Direct correlation between LPS and insulin were also found in women with less-healthier dietary pattern (ρ=0.339, p<0.001).

CONCLUSIONS

Dietary intake and serum LPS show distinct relations according to dietary quality status in pregnant women with overweight or obesity. This may be reflected in aberrant glucose metabolism and insulin resistance in this study population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP45_08

COMMENSALITY - THE PRACTICE OF EATING TOGETHER IN OLDER AGE

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BACKGROUND AND OBJECTIVES

Older adults are increasingly self-sufficient and have better physical function than before. Many older adults are satisfied with life, but in very old age loneliness increases. Participating in health-promoting activities with others, such as eating together, can contribute to better social interaction. Older adults who participate in social meals tend to feel less lonely and eat more nutritious meals. The aim of this study was to understand commensality among older adults and how it changes as years go by.

METHODS

This qualitative longitudinal study used a phenomenological research design to gain deeper insight into older adults' meal experiences. Data collection was carried out first in 2011/2012 and was followed up in 2020/21 using semi-structured interviews. We conducted a total of 24 interviews with 16 participants aged 67 to 94 years.

RESULTS

The first round of the study showed how commensality contributed to good life quality. In the follow-up, we found that changes in life situations, such as being alone, medical conditions, or decreasing physical activity, were factors that impacted their eating habits. We also observed that age played a significant role in their willingness to venture out and meet other older adults for social gatherings.

CONCLUSIONS

The study showed that commensality played an important part in the respondents' perception of a good life. Facilitating commensality also among the oldest old could be a good strategy for local communities to improve their quality of life. This can help to maintain good health and prevent nutrition-related diseases such as malnutrition in this group.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP45_09

NUTRIENT PROFILE OF FOODS CONSUMED BY ADOLESCENTS IN SENEGAL, ACCORDING TO NOVA CLASSIFICATION

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BACKGROUND AND OBJECTIVES

Adolescence is a period of intense growth that requires a balanced diet to prevent health problems in adulthood. However, the growing exposition to ultra-processed foods (UPF) increases the risk of non-communicable diseases (NCDs). This study aimed to determine the nutrient profile of foods consumed by adolescents in Senegal.

METHODS

A food consumption survey was carried out among 2 121 Senegalese adolescents aged 10-19 years, randomly selected from households using three-stage cluster sampling as part of a national cross-sectional study of anemia. The foods consumed by the adolescents were recorded using the individual 24-hour dietary recall and then grouped according to the NOVA classification system. The nutrient content of foods, including total fat (TF), saturated fat (SF), total sugars (TS) and sodium, was collected from product labels or food composition tables. The nutrient profile of the foods was assessed using the WHO's nutrient profile model for the African region.

RESULTS

The NOVA food groups most frequently consumed were unprocessed or minimally processed foods (52%), followed by processed culinary ingredients (24%), UPF (16%) and processed foods (8%). Among 381 unique foods analyzed, processed culinary ingredients had the highest median values for energy (898.5 kcal/100g; IQR [397.3-900]) and TF (99.9 g/100g; IQR [0.07-100]). Processed foods had the highest sodium content (0.17 g/100g; IQR [0.01-0,4]), while UPF had the highest TS content (30.05 g/100g; IQR [10.1-60.2]). Overall, 41.2%, 24.9% and 26.8% of the foods exceeded the recommended limits for TS, TF and energy, respectively. All groups, except for the minimally processed or unprocessed foods, had high rates of non-compliance with the thresholds for TS (over 98%) and energy (over 82%). In addition, 36.4% and 14.3% of the culinary ingredients exceeded the thresholds for SF and sodium, respectively. For processed foods, respectively 50% and 26.8% exceeded the limits for TF and sodium. More than half of the UPF were above the thresholds for TF (61.1%) and SF (57.1%).

CONCLUSIONS

Senegalese adolescents' diet is marked by a predominance of unprocessed or minimally processed foods. Half of the foods consumed exceeded the recommended thresholds for TS, while a quarter surpassed the limits for TF and energy. Most UPF were above the levels recommended for nutrients of concern. This highlights the need to implement strategies to restrict the promotion of unhealthy foods and prevent diet-related NCDs among adolescents.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP45_11

AN OPEN-LABEL RANDOMIZED CONTROLLED TRIAL TO COMPARE THE EFFICACY OF DAILY SUPPLEMENTATION OF SMALL QUANTITY LIPID-BASED NUTRIENT SUPPLEMENTS (SQLNS) VS. IRON AND FOLIC ACID (IFA) SYRUP, FOR ANEMIA PROPHYLAXIS AMONG CHILDREN AGED 6 MONTHS TO 24 MONTHS

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BACKGROUND AND OBJECTIVES

Anemia affects approximately 78% of Indian children aged 6–23 months [1]. Despite efforts under the Anemia Mukt Bharat program, adherence to Iron and Folic Acid (IFA) syrup remains low [1,2]. Home food fortification with Small Quantity Lipid-based Nutrient Supplements (SQLNS), yet to be studied in India, could offer better outcomes. This study compares the efficacy of daily supplementation of oral SQLNS vs. oral IFA syrup for anemia prophylaxis among non-anemic children aged 6 months to 24 months, measured by change in hemoglobin, after 3 months of intervention.

METHODS

This community based non-inferiority parallel group open-labelled randomized control trial was conducted among non-anemic children aged 6 months to 2 years. A total of 100 children were randomised to receive either SQLNS or IFA syrup for 3 months. Hemoglobin levels were measured at baseline and endline, with the primary outcome being the difference in mean hemoglobin levels.

RESULTS

Baseline characteristics were similar between the two groups. Mean adherence rates were 54% for the SQLNS group and 73% for the IFA group. The change in hemoglobin levels (mean ± SD, g/dL) was 0.11 ± 1.1 for SQLNS and 0.36 ± 1.37 for IFA, with the SQLNS group showing a 0.25 g/dL lower mean increase compared to the IFA group. Adverse events were reported more frequently among participants receiving IFA syrup (72%) compared to those receiving SQLNS (48%).

CONCLUSIONS

Both SQLNS and IFA syrup effectively improved hemoglobin levels. However, due to higher adverse events with IFA syrup, SQLNS is the preferred option.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP45_12

FOOD INSECURITY AND OBESITY AMONG SYRIAN FEMALE REFUGEES IN TÜRKIYE

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BACKGROUND AND OBJECTIVES

Food insecurity is a risk factor for obesity among refugees, especially in women (1-3). The food insecurity-obesity paradox suggests that the overconsumption of low-cost, high-calorie, and less nutritious food, often linked to low socioeconomic status, can lead to overweight and obesity (4). This study aims to evaluate the association between household food insecurity and obesity among Syrian female refugees living in Türkiye.

METHODS

This descriptive cross-sectional study was conducted with 180 Syrian female refugees aged 18–64 living in Türkiye. Participants' sociodemographic data, anthropometric measurements, and food insecurity status were assessed. The Body Mass Index (BMI) was calculated by dividing weight (kg) by height squared (m^2) and categorized according to the World Health Organization classification. The FAO's Food Insecurity Experience Scale was used to determine the level of food insecurity (5).

RESULTS

The mean age of the individuals was 26.2± 9.17 years. Among the women in the study, 64.4% were single, and 71.7% were university graduates. It was found that 14.4% of the women had food security whereas the rest of them experienced some sort of food insecurity (46.7% mild food insecurity, 21.1% moderate food insecurity, and 17.8% severe food insecurity). The food-insecure group had a significantly higher mean BMI (24.7±4.98 kg/m2) than the food-secure group (23.5±4.123 kg/m2) ($p=0.04$) and a significantly higher number of overweight and obese women ($p=0.048$). There was a statistically significant positive correlation between the FIES scores and BMI values of the participants ($r: 0.236$, $p<0.01$). When there is a 1 unit increase in BMI value, there is a 0.221 increase in the total FS value ($p:0.003$).

CONCLUSIONS

In conclusion, this study found a positive association between food insecurity and obesity among Syrian female refugees living in Türkiye. Investigating the relationship between food insecurity and obesity among refugees is essential for developing effective policies and assistance programs. Comprehensive mixed-method studies are needed to understand this issue fully and to inform targeted interventions.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP45_13

ASSOCIATION BETWEEN VICTIMIZATION AND UNHEALTHY EATING PATTERNS AMONG LOW-INCOME WOMEN OF COLOR

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BACKGROUND AND OBJECTIVES

Low-income women and women of color (WOC) often exhibit poor diet quality and high rates of cardiometabolic disease. Healthy eating is considered a key factor for cardiometabolic health. As an “upstream” risk factor, victimization and neglect have also been associated with poor negative cardiometabolic outcomes. Further examining this association may contribute to the development of effective healthy eating interventions for WOC with victimization experiences.

METHODS

Twelve low-income, cis-gendered and transgender, Black, Latina, South Asian and Filipina WOC, 18-65 y.o., from New York City and Baltimore, Maryland were interviewed. WOC were asked about the following topics: 1) familial and social networks; 2) experiences with food during early life; 3) eating patterns and food preparation; 4) body image; 5) economic issues; 6) substance use over the life course; and 7) victimization experiences over the life course.

RESULTS

Physical, verbal, and sexual victimization were associated with unhealthy eating patterns mediated by negative mental health and/or substance use. Mental health issues that were mentioned by participants included depression, anxiety, anorexia, and bulimia. Substances used included alcohol, cannabis, and/or methamphetamine. Some women also engaged in “harm reduction” approaches to mitigate or prevent the consumption of unhealthy food while under the influence of substances. One approach was to arrange the environment before engaging in substance use to prominently display healthy food options while hiding unhealthy food options.

CONCLUSIONS

More research is needed to examine the association between victimization and unhealthy eating patterns among low-income women of color. Effectively addressing victimization among low-income WOC may result in the mitigation of unhealthy eating patterns. Training low-income WOC survivors of victimization to implement “harm reduction” approaches while under the influence of substances may also result in mitigating unhealthy eating patterns.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP45_14

NUTRITION EDUCATION THROUGH MOBILE APP IMPROVED KNOWLEDGE BUT HAD LIMITED IMPACT ON ANEMIA PREVENTION PRACTICES AMONG ADOLESCENT GIRLS FROM LOW-MID SOCIOECONOMIC BACKGROUNDS

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BACKGROUND AND OBJECTIVES

Previous studies have shown low awareness among adolescents about anemia prevention behaviors, making innovative nutrition education strategies essential to complement nutrition programs for anemia control in adolescents and accelerate their effectiveness. This study aims to develop an app-based intervention to change knowledge, attitudes, and anemia prevention practices among adolescent girls from lower-middle socioeconomic backgrounds.

METHODS

A quasi-experimental study with a pre- and post-test design with a control group was conducted in two selected high schools in an urban area, where one school was designated as the treatment group (n=30) and the other as the control group (n=38). Participants were randomly recruited from each school and consisted of first- and second-year female students (aged 14–17). The intervention was delivered through a series of educational materials on anemia via the Android-based EndMia app for 10 weeks. The control group received the educational materials electronically after the intervention was completed in the treatment group. Pre-test and post-test measurements of knowledge, attitudes, intentions, and practices were conducted using a valid questionnaire. To assess the impact of the intervention on changes in outcome variables, statistical tests were conducted to compare the mean scores of knowledge, attitudes, and practices before and after the intervention within each group and to compare the magnitude of these changes between the two groups.

RESULTS

The study RESULTS showed an increase in knowledge in both groups at the end of the intervention, but the changes were greater and significant ($p<0.05$) in the treatment group compared to the control group. Improvements in attitudes, intentions, and practices were observed in the treatment group but not in the control group, although the effects were relatively small ($p>0.05$).

CONCLUSIONS

The findings suggest that the mobile phone app has a potentially positive impact on anemia prevention behaviors, though broader strategies beyond nutrition education are necessary, especially in economically disadvantaged contexts.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP45_15

COMPARISON OF WEIGHING SCALES FOR CHILDREN AGES 0 TO 59 MONTHS IN TWO MUNICIPALITIES IN LAGUNA, PHILIPPINES

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BACKGROUND AND OBJECTIVES

Accurate weight measurement is critical for assessing growth and nutritional status in children. However, measurement errors due to equipment can affect reliability. This study evaluated the reliability and consistency of weight measurements by community health workers using four tools: SECA model 878, NutriScale Digital, Tanita model HD-662, and Salter Hanging Infant Weighing Scale

METHODS

A cross-sectional field trial was conducted in two municipalities in Laguna, Philippines. Three pairs of end-users measured the weight of 80 children aged 0 to 59 months across House-to-House and stationary setups in rural and urban areas. Inter-measurer and intra-measurer reliability were evaluated using correlation coefficients (CC), Technical Error of Measurement (TEM), and coefficient of variation (CV). TEM values below 0.1 kg and %TEM within acceptable limits (≤1.5% for intra-measurer and ≤2% for inter-measurer) were benchmarks for reliability.

RESULTS

NutriScale exhibited the lowest TEM values (0.03–0.07 kg) and %TEM across all settings, making it the most reliable tool. Tanita followed closely, with TEM values ranging from 0.05 to 0.09 kg. Salter, while considered the gold standard, recorded higher TEM values (0.03–0.13 kg) and consistently overestimated weights, particularly in rural and House-to-House setups. SECA demonstrated some variability, with TEM values between 0.06 and 0.10 kg, but remained within acceptable reliability limits. Significant differences in weight measurements were observed between House-to-House and stationary setups for some tools, particularly in the rural area.

CONCLUSIONS

SECA, Tanita, and NutriScale are reliable alternatives to the Salter scale for weighing children aged 0 to 59 months. NutriScale demonstrated the highest reliability across rural and urban areas and in both house-to-house and stationary settings. Tanita and SECA also performed well, with minor variability between settings. Accurate RESULTS require proper calibration, initial training, and regular recalibration. These steps are crucial for ensuring consistency, especially in community programs like Operation Timbang (OPT).

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP45_16

THE URGENT NEED FOR COMPREHENSIVE TOOLS TO MEASURE HUNGER AND MALNUTRITION IN CHILDREN

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BACKGROUND AND OBJECTIVES

Hunger and malnutrition remain urgent global crises, disproportionately affecting children and adolescents and perpetuating cycles of poverty and inequality. Despite their critical importance, current tools for measuring these issues often fail to capture the full extent of the problem, especially at the individual level for children and adolescents. This review highlights the pressing need for standardized, comprehensive tools that can capture the various aspects or dimensions of children and adolescents' hunger and food insecurity, ensuring effective interventions and policies.

METHODS

A scoping review was conducted between July and September 2024, employing a two-stage search strategy to identify relevant tools and indicators. Academic and grey literature were retrieved from relevant sources and systematically analyzed, focusing on validation, reliability, and applicability to children aged 0–19 years. Tools were assessed against criteria such as their capacity to capture multidimensional aspects of hunger, their cultural adaptability, and their ability to measure the severity of food insecurity

RESULTS

The review identified 67 tools, including 33 that address child and adolescent hunger and food insecurity; however, only a few directly engage children and adolescents as respondents. Existing tools, such as the Child Food Insecurity Experience Scale (CFIES), show potential but have limitations in accurately capturing the severity of food insecurity and the unique needs of adolescents. Furthermore, significant gaps remain in assessing the socio-cultural and psychological dimensions of food insecurity, while standardized anthropometric measures for children and adolescents continue to be inadequate

CONCLUSIONS

The findings underscore the critical need for comprehensive, age-sensitive, and culturally adaptable tools to measure hunger and malnutrition accurately. Enhancing existing tools like CFIES while developing frameworks that capture the multidimensional nature of food insecurity will enable better-targeted interventions. Addressing these gaps is essential to support effective policy-making and ensure progress toward eradicating child hunger and malnutrition

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 46 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP46_01

UNRAVELING THE IMPACT OF PREWEANING KETOSIS ON METABOLIC PROGRAMMING AND ITS IMPLICATIONS FOR OBESITY

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BACKGROUND AND OBJECTIVES

Ketone bodies rise during limited carbohydrate intake. Typically below 0.1 mM in healthy adults, they reach 0.5–2 mM (nutritional ketosis) in breastfed infants. Limited breastfeeding has been linked to increased childhood obesity risk. This study investigates the impact of preweaning ketosis on obesity, particularly in the context of beige adipogenesis, and explores the underlying molecular mechanisms.

METHODS

Two ketone body-deficient models, early weaning and Hmgcs2 knockout (KO) mice, were used to assess preweaning ketosis effects on beige adipogenesis and thermogenesis. In early weaning, pups were weaned at postnatal day 12 (P12; EW group), while control suckling mice (SK group) continued breastfeeding. A rescue group (EW-MCT) was supplemented with medium-chain triglycerides (MCTs) until P21. Mice were assessed after 12 weeks of HFD feeding. In Hmgcs2 KO mouse model, control and Hmgcs2 KO adult mice underwent cold exposure experiments, followed by analyses of body temperature and inguinal white adipose tissue (iWAT). Molecular mechanisms were explored using bulk RNA sequencing and single-cell RNA sequencing (scRNA-seq).

RESULTS

Early-weaned pups showed greater weight gain, increased fat weights, adipocyte hypertrophy, and hepatic steatosis compared to the control SK group after 12 weeks of HFD. MCT supplementation reduced HFD-induced weight gain, adiposity, adipocyte hypertrophy, and hepatic steatosis. Glucose intolerance and insulin resistance in the EW group were rescued by MCT supplementation. In the Hmgcs2 KO model, control mice displayed increased beige adipocytes and thermogenic gene activation in iWAT during cold exposure. In contrast, Hmgcs2 KO mice showed fewer beige adipocytes, reduced thermogenesis, and lower body temperature. scRNA-seq identified a subset of adipocyte precursor cells (APCs) in the stromal vascular fraction (SVF) induced by elevated βHB levels.

CONCLUSIONS

Loss of preweaning ketogenesis through early weaning exacerbated obesity, impaired glucose metabolism, and reduced thermogenesis in diet-induced obese mice, while MCT supplementation during lactation rescued these abnormalities. Similarly, loss of endogenous ketogenesis in Hmgcs2 KO mice impaired cold-induced beige fat formation. These findings underscore the critical role of preweaning ketosis in regulating beige adipogenesis, thermogenesis, and metabolic health, suggesting potential interventions for early metabolic programming.

CONFLICTS OF INTERESTS
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SOAP46_02

PREVALENCE OF UNDERNUTRITION AND FEEDING DIFFICULTIES AMONG CHILDREN WITH DISABILITIES IN UGANDA: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

Globally, over 240 million children have disabilities, with those living in low- and middle-income countries facing significant barriers to adequate healthcare and nutrition. Despite the well-established link between disability and nutrition, considerable data gaps persist, globally and in Uganda, regarding the nutritional status of children with disabilities. This study aimed to estimate the prevalence of undernutrition and risk for feeding difficulties, and to assess common feeding practices among children with disabilities receiving services at a leading rehabilitation hospital in Uganda.

METHODS

We conducted a cross-sectional analysis of data from 350 children with disabilities aged birth to 10 years, collected between July 2024 and January 2025. Data included demographics, anthropometric measurements (weight, height, and mid-upper arm circumference [MUAC]), hemoglobin levels, risk for feeding difficulties, and caregiver-reported feeding practices. Undernutrition was assessed using the World Health Organization *z*-scores for anthropometric measurements, MUAC cut-off points, and anemia criteria. Statistical comparisons were made using ANOVA and Pearson's chi-squared tests.

RESULTS

The majority of participants were under 5 years old (89.4%) and more than half were male (56.6%). The most prevalent disabilities were cleft clip/palate (56.9%), followed by cerebral palsy (36.3%) and other disabilities (6.9%). Undernutrition was common: 44.7% of children were underweight, 38.1% stunted, 14.0% wasted (using MUAC), and 42.1% anemic. Children with cerebral palsy had significantly lower anthropometric *z*-scores and higher rates of underweight ($p<0.05$) and wasting ($p<0.05$) compared to children with other disabilities. Additionally, 88.3% of children were at risk for feeding difficulties, with common issues including coughing or choking and prolonged mealtimes. While most caregivers reported responsive feeding practices, interaction with infants and children during feeding was identified as a key area of improvement.

CONCLUSIONS

This study highlights the high burden of undernutrition and feeding difficulties among children with disabilities in Uganda. The findings underscore the urgent need for inclusive policies and community-based nutrition and feeding programs tailored to the needs of children with disabilities in Uganda and similar settings.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP46_04

MATERNAL HEIGHT AND SMALL VULNERABLE NEWBORN OUTCOMES: A STUDY FROM RURAL NEPAL

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BACKGROUND AND OBJECTIVES

Childhood stunting highlights the life-course and inter-generational effects of undernutrition. Women who experience chronic undernutrition as children are often of short stature, leading to poor birth outcomes such as stillbirth, preterm delivery, low birthweight, and/or small-for-gestational age. Small vulnerable newborn (SVN) is a new metric that defines categorical combinations of preterm/term delivery and small, appropriate, or large for gestational age. These SVN categories capture the distinct etiology and epidemiology of babies born too soon, too small, or both. SVN prevalence and neonatal mortality risk are inequitably concentrated in sub-Saharan Africa and South Asia. We aim to describe the association of maternal height and risk of SVNs in rural Sarlahi District, Nepal, a setting in South Asia.

METHODS

The Nepal Oil Massage study (NOMS) followed 29,887 pregnant women through delivery to collect birth outcomes and neonatal survival. Short maternal stature was defined as <145 centimeters (cm), moderately short as 145-149 cm, and non-short stature as ≥150 cm. Size for gestational age centiles were calculated using infant sex, gestational age (using timing of last menstrual period), and birthweight using the Intergrowth-21 standard population. Missing birthweight was imputed. SVNs were defined as babies born term or post-term (≥37 weeks) and small for gestational age (SGA, <10th percentile) (TSGA), term appropriate or large for gestational age (TAGA/TLGA, ≥10th percentile) and preterm (PAGA/PLGA), or PSGA. We performed multinomial analysis to generate odds ratios of SVN for the three height categories adjusted by maternal education, parity, and age.

RESULTS

Among the cohort, 3111 (14.2%) of women were <145 cm and 6525 (29.7%) were 145-149 cm. The prevalence of SVNs was 41.6% TSGA, 13.5% PAGA/LGA, and 2.1% PSGA. Women with short stature were 2.1 times (95% CI: 1.9-2.3) more likely to have a baby born TSGA compared to women with non-short stature. There were higher odds of preterm birth outcomes among women with short stature compared to non-short stature women (PAGA/PLGA (1.7, 95% CI: 1.5-1.9) and PSGA (2.9, 95% CI: 2.3-3.5). Women with moderately short stature were also at higher risk of TSGA (1.5, 95% CI: 1.4-1.6), PAGA/PLGA (1.4, 95% CI: 1.3-1.5), and PSGA (1.6, 95% CI: 1.4-2.0).

CONCLUSIONS

Infants born to women with both short and moderately short stature had higher odds of all SVN phenotypes in rural Nepal. Using the SVN metric in nutritional analyses of live birth outcomes allows for a more refined description of prevalence and risk.

CONFLICTS OF INTERESTS

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SOAP46_07

INTAKE24-MALAYSIA: A DISCOVERY APPROACH ON ADAPTING AN ONLINE 24-HOUR DIETARY ASSESSMENT TOOL IN A MULTICULTURAL ENVIRONMENT

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BACKGROUND AND OBJECTIVES

Dietary assessment tools are essential for evaluating dietary habits and informing effective nutrition interventions. However, many of these tools fall short of addressing the complexities of multicultural environments. In Malaysia, a country rich in ethnic diversity, including Malays, Chinese, Indians, and Indigenous peoples, there is a significant need for an adapted approach to dietary assessment. This protocol outlines the adaptation and validation process for Intake24 Malaysia (Intake24-MY), an online dietary assessment tool tailored to reflect the multicultural dietary patterns of Malaysia.

METHODS

The methodology consists of two phases: (1) adaptation of Intake24 for the Malaysian context and (2) validation of the newly developed tool, Intake24-MY. Phase 2 (validation) is structured into four key phases: (i) validating food portion photographs (ii) pilot testing for system usability and food item identification (iii) relative validation against interviewer-led 24-hour dietary recalls and (iv) absolute validation in a controlled-single meal-setting.

RESULTS

Phase 1 compiled a comprehensive food list that includes both traditional and convenience foods representative of Malaysia's ethnic diversity, translated the text and food items within the system into Bahasa Melayu, Mandarin, and Tamil and created food portion size images and new food composition data to enhance the tool's relevance for the Malaysian context. A food list comprising 3,808 items, including 1,548 Malaysian foods, has been established, and the initial translation work is complete. Phase 2(i) has been completed with six food items that had a wide range of portion size estimates, with some foods showing more variation than others.

CONCLUSIONS

A systematic approach to improving Intake24 for multicultural contexts will provide valuable insights for future adaptations. Intake24-MY aims to enhance access to an open-source dietary assessment tool for diverse populations by including cultural perspectives, making it more effective for various communities.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP46_08

A MIXED-METHOD STUDY ON DIETARY PATTERNS, NUTRITIONAL STATUS, AND PARENTAL PERCEPTIONS OF FOOD CHOICES IN CHINESE CHILDREN AGED 3-11 YEARS

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BACKGROUND AND OBJECTIVES

Parental perceptions of food influence children's food choices, shaping their dietary habits and nutritional status1. This study aimed to examine dietary patterns, nutritional status, and impact of parental perceptions on children's food choices using a mixed-method approach2.

METHODS

Anthropometric, dietary and sociodemographic data were collected from 919 children (3-11 years) and their parents across three provinces in China. Dietary patterns were identified using principal component analysis3. A subsample of 40 parents completed a 7-day food photographic diary4 and interviews, with data analysed thematically5.

RESULTS

Stunting, wasting, and underweight were low (1-2%), while 16.4% and 10.8% of children were overweight and obese, respectively, with higher rates among primary schoolchildren (36.3%). Two dietary patterns were identified: "Mixed-Westernised" (high in sugar, fat, and processed ingredients) and "Mixed-Diversified" (rich in varied, unprocessed foods). Regression analyses showed that higher "Diversified diet" z-scores were significantly associated with higher height-for-age z-scores (β=0.75; 95% CI=0.11, 1.39, p=0.022), and lower weight-for-age z-scores (β=-1.27; -2.30, -0.23, p=0.016), after adjusting for confounders. Thematic analysis showed rural and urban parents both prioritised healthy diets and food safety, though regional and age-related differences were evident. Parents of preschool children emphasized dietary diversity, while those with primary schoolchildren prioritised taste preferences. Rural parents emphasised price, variety, and ingredient quality, often using homegrown produce and family/online recipes. Urban parents prioritised health, convenience, and professional advice, preferring online shopping, supermarkets, frozen/ready-to-eat foods, and supplementation.

CONCLUSIONS

Sociocultural environment significantly shapes children's dietary patterns, impacting their nutritional status. Interventions tailored to these factors are necessary to improving children's nutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP46_10

ASSOCIATION OF ULTRA-PROCESSED FOOD CONSUMPTION WITH BLOOD PRESSURE IN BRAZILIAN AND BRITISH ADOLESCENTS

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BACKGROUND AND OBJECTIVES

Ultra-processed foods (UPF) are known as a central part of the current unsustainable food system, considering the higher gas emissions, land and energy used in their production (1). Besides that, the high consumption of UPF has been linked to obesity and other health problems. Studies in adults have shown a positive association between UPF consumption and blood pressure(2). However, longitudinal studies across childhood and adolescence are scarce. This study assessed the association between UPF consumption and body composition indicators in Brazilian and British adolescents.

METHODS

We used data from the British cohort ALSPAC (n=5278) and the Brazilian cohorts Pelotas 2004 (n=3126) and BRISA (n=747). Childhood exposure to ultra-processed foods (UPF) was assessed at ages 3.0-5.1 years in ALSPAC, 6.0-7.5 years in Pelotas 2004, and 1.0-2.8 years in BRISA. Food frequency questionnaires were used in ALSPAC and Pelotas, while a 24-hour recall was used in BRISA. The blood pressure was measured at the average ages of 13.8, 11, and 12 years using similar blood pressure monitors. Body mass index was calculated (BMI – weight(kg)/height(m)2). Linear regression models, adjusted for maternal education, family income, pre-pregnancy BMI, total grams of non-UPF, and the ratio of Energy Intake to Estimated Energy Requirements (EI/EER), were used to assess the association between tertiles of UPF consumption and systolic and diastolic blood pressure (SBP and DBP).

RESULTS

The mean of UPF consumed in the third vs first tertile was 579g vs 267g in ALSPAC, 1871g vs 493g in PL 2004, and 342g vs 46.5g in BRISA. Higher UPF consumption was observed among children of mothers with low socioeconomic status. Children in the third tertile of UPF consumption had an SBP level 4 mmHg higher than those in the first tertile (115.0 mmHg vs. 111.0 mmHg, $p<0.001$), while for DBP, the difference was 2.5 mmHg (67.6 mmHg vs. 65.1 mmHg, $p<0.001$). The differences were of the same magnitude between males and females. After additional adjustment for BMI, the estimates lost significance for SBP (113.0 mmHg vs. 113.0 mmHg, $p<0.001$) and DBP (66.6 mmHg vs. 66.0 mmHg, $p=0.270$).

CONCLUSIONS

Higher UPF consumption was only linked to increased SBP and DBP in Pelotas 2004 Cohort. It is important to note that in ALSPAC, it was not possible to adjust for the ratio of EI/EER to control for misreporting, which may have attenuated the estimates in this cohort. The associations were mainly attenuated by adjustment for BMI, which shows that BMI accounts for most of the association between UPF and blood pressure in these children.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP46_12

THE ROLE OF NON GOVERNMENTAL ORGANIZATIONS IN SCALING UP IMPACT OF NUTRITION PROGRAMS FOR CHILDREN 0-5 YEARS OLD IN THE WESTERN VISAYAS REGION - A CASE STUDY RESEARCH

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BACKGROUND AND OBJECTIVES

Child malnutrition in Western Visayas, Philippines, remains a multidimensional crisis with far-reaching consequences. Stunting affects over 40 percent of children under five in the region, significantly higher than the national average of 28.8 percent, while wasting impacts 5.58 percent, reflecting acute malnutrition (Philippine Statistics Authority, 2021). Using the Social Enterprise Compass, Theory of Change (TOC) model, and Root Cause Analysis framework, this case study research evaluated the important role of non government organizations in increasing impact and achieving a decrease in stunting and wasting rates and scalability of operations in nutrition programs.

METHODS
Primary data collection was done through validation workshops and key informant interviews with all the key stakeholders that were recognized in our initial stakeholder analysis for a specific NGO in Western Visayas that implements nutrition programs. These were transcribed and analyzed thematically to gather key insights. Secondary data collection was done through the collection and review of Government or Public Data (Philippine Statistics Authority, National Nutrition Council, Department of Finance), local Nutrition Budgets (Iloilo Provincial Office), and profiles of other NGOs functioning as social enterprises for scalaibility to supplement the RESULTS.
RESULTS

Using the theory of change model, a roadmap was created that illustrates how their organization can scale up their impact to reach the nutrition goal of eradication of stunting and wasting in Western Visayas by 2030. It is also important for the communities to be involved in program planning and implementation. Involvement of community members can be done by adding capacity building components and strengthening the livelihood programs that can feed into the supply chain of the mixed model approach.

CONCLUSIONS

Through this case study, we have found that it is possible for a non governmental organization to scale up their nutrition program’s impact and help eradicate stunting and wasting in under 5 children in Western Visayas by adopting a mixed model approach for scaling up. Shifting to the mixed model approach of creating a for-profit entity that will act as a social enterprise whose profits all go back to support the nutrition programs will not only be profitable in the long run, but also help reach all the stunted children aged 0-5 years old in Region VI.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP46_13

BOTTLENECKS TO PRENATAL SUPPLEMENTATION DURING PREGNANCY IN ETHIOPIA

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BACKGROUND AND OBJECTIVES

The government of Ethiopia is piloting the scaleup of Multiple Micronutrient Supplementation (MMS) to replace Iron-Folate Acid Supplementation (IFA) as part of routine antenatal care (ANC). Adherence to prenatal supplementation is sub-optimal in many settings, including in Ethiopia, and to achieve high adherence for MMS it is important to learn lessons from IFA. Through analysis of data from a two-arm cluster randomised control trial, we aimed to assess the drivers of adherence for IFA and MMS in Ethiopia, generating transferable learning between the two supplements about what works to improve effective use.

METHODS

Multi-respondent facility surveys were conducted over 42 districts, 5 regions of Ethiopia. Baseline data was collected in January 2023 with an endline survey two years later in January 2025. At both survey points data was collected in 209 health facilities, interviewing 10,305 mothers with a recent live birth and 209 health staff. Data on sociodemographic variables, the number and timing of antenatal care contacts, the receipt, use, and adherence to either IFA or MMS were analysed at baseline and endline. Analysis focused on whether and how the drivers of MMS or IFA adherence differ.

RESULTS

At baseline in the IFA arm**,** 49% of mothers reported taking at least 90 IFA tablets by the end of pregnancy. The mean gestation week at first ANC was 22(±8) weeks and one-fifth (18%) of the mothers (95% CI:16, 19) had their first ANC within 12 weeks of pregnancy. Although receipt of IFA at least once during pregnancy was almost universal (91%) by the end of pregnancy, just 63% of early attenders were given IFA at their first ANC visit. Both late first ANC attendance and not giving supplements to all women at the first visit were identified as adherence bottlenecks, limiting the amount of exposure time available to complete 90 IFA tablets. Endline data analysis will explore the size of these bottlenecks for IFA and for the newly introduced MMS, examining differences between IFA and MMS study arms and over time within the IFA study arm.

CONCLUSIONS

Both health system and user bottlenecks were observed to limit universal coverage and adherence of IFA. Incremental improvements in the behaviours of health workers when distributing prenatal supplementation and the preferences of women around timing of first ANC and consumption could improve the current sub-optimal uptake, crucial to the full benefit of prenatal nutritional supplements is to be realised.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP46_14

Estimating the effective coverage of prenatal multiple micronutrient supplementation and iron-folate supplementation in Ethiopia: RESULTS from a large-scale pragmatic cluster-randomised trial

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BACKGROUND AND OBJECTIVES

Effective coverage measures aim to estimate the proportion of a population in need of a service that receive a positive health outcome, taking account of health system processes, health care quality and the series of complex interactions between care providers and care users. Using a coverage cascade of programmatic steps, these measures provide essential information for decision making about where and how programme improvements can be made. Few examples of effective coverage exist for nutritional interventions. Accessing data from the multiple micronutrient supplementation (MMS) trial in Ethiopia, the objectives of this presentation are to define, calculate and examine effective coverage measures for prenatal nutritional supplement programmes in Ethiopia.

METHODS

The MMS trial is a pragmatic, facility-based, randomised trial conducted in 42 districts over 5 regions of Ethiopia between January 2023 and December 2024. Districts are randomised to one of two arms, either to retain iron-folic acid (IFA) supplementation as part of routine antenatal care or switch to MMS. Detailed data about processes and birth weight outcomes are collected in both study arms, including through comprehensive facility surveys at start-up and endline. Accessing these data, effective coverage estimates will be calculated separately for MMS and for IFA. In doing so it will be possible to identify and quantify where opportunities are lost to maximise the potential effectiveness of each supplement. This analysis will be carried out at the start-up period and at endline to examine whether and how the programme effectiveness changed over time.

RESULTS

In January 2023, data were collected from 209 health facilities, 209 health workers and 10,305 women. The effective coverage of MMS was estimated to be 9.7%. Across the effective coverage cascade the largest drop in coverage was observed because of inadequate roll-out of MMS stock in facilities. In the same period, the effective coverage of IFA was estimated to be 3.2%, with inadequate training of health staff causing the largest drop in coverage. Endline analysis of effective coverage of both programmes will be done in April 2025 using the same survey METHODSand RESULTS will be presented in detail alongside a critical analysis of opportunities to strength programme effectiveness.

CONCLUSIONS

Effective coverage cascades for prenatal nutritional supplements in Ethiopia reveal opportunities for system strengthening that enhances the potential health benefit available to women and their newborns.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP46_15

EFFECT OF THE INTERVENTION WITH THE MOBILE APPLICATION 'AMAMANTAPP' ON KNOWLEDGE, ATTITUDES AND PRACTICES OF HUMAN MILK DONATION IN BREASTFEEDING WOMEN: RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Background: Breastfeeding in preterm infants is disrupted, requiring donated breast milk. Human Milk Banks become allies in reducing the mortality of premature babies. However, the number of donors is insufficient to meet the demand. Low donations are due to lack of knowledge about donation and to perceptions, beliefs and attitudes that influence the predisposition to donate. As a solution, we propose the development and evaluation of a mobile application to promote a culture of human milk donation.Objective: To determine the effect of the mobile application Amamantapp on knowledge, attitudes and practices towards human milk donation among breastfeeding women in Lima, Peru.

METHODS

Methods:A randomised controlled trial involving 112 breastfeeding mothers was conducted. The intervention group (n=54) received human milk donation education on a mobile app, the control group received printed educational materials. The intervention time was 8 weeks. Participants were enrolled during the days following delivery in the inpatient ward of a mother and child hospital in the city of Lima. For the development of the mobile application, the design thinking methodology was used, which identified the needs of the participants. The mobile intervention was then developed and used for a period of 60 days in the intervention group. Knowledge, attitudes and practices will be assessed with a CAP questionnaire before and after the mobile intervention.

RESULTS

The RESULTS of the study showed no differences in socio-demographic characteristics such as age, educational level, number of children, number of children, income, marital status, internet access and employment status between the breastfeeding mothers in the intervention group and the control group. When analysing the effect of the Amamantapp mobile application, significant differences were found between groups with higher knowledge scores for the intervention group (MD (mean difference): 0.94 points, p=0.04). No differences were found in attitudes or practices towards milk donation in the breastfeeding mothers participating in the study.

CONCLUSIONS

Breastfeeding women showed an improvement in knowledge about human milk donation using the mobile application Amamantapp. The RESULTS further showed that improving attitudes and practices towards human milk donation using mobile applications requires further study.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP46_16

NOURISHING NATIONS' SURVEY OF SMALL-SCALE FISH PROCESSORS TO INFORM TRAINING TO IMPROVE FOOD SAFETY AND FISH HANDLING AND PROCESSING IN RURAL NIGERIA

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BACKGROUND AND OBJECTIVES
Nutrient-dense and relatively inexpensive, fish contribute to the food security and livelihoods of resource-limited households across sub-Saharan Africa (SSA). For example, Nigeria is one of many countries in SSA that rely on fish for their main animal source food [1]. However, foodborne illness linked to inadequate food safety/hygienic practices during processing is a public health concern in Nigeria and throughout SSA [2-5] where, for example, rural fish processors rely on traditional METHODSthat can expose fish/fish products to contaminants [6,7]. To inform development of training to strengthen hygienic fish handling/processing and improve the quality and safety of fish/fish products among low-literate fish processors, we conducted a baseline survey to collect demographics and identify critical knowledge gaps and current fish handling/processing practices.
METHODS

Administered to purposive sample of fish processors (N=99) in rural Nigeria, the survey focused on knowledge and practices regarding nutrition and fish handling/processing.

RESULTS

Most respondents were women (73.7%), 29-49 years old (84.8%), married (79.1%), with households (HH) of 4-6 members (52.5%). Five percent had not completed primary school, 21.2% had a primary education, 35.4% had a secondary education, and 24.2% had some post-secondary technical training. A majority reported that their HH had a pour-flush toilet (86.9%), used a community borehole for water (86.5%), had access to electricity (42.2%), and that at least one HH member owned a smartphone (63.6%). Most reported some formal training in fish for human nutrition (93%) and knowledge of health benefit of consuming fish (93%), yet few had knowledge of risks associated with consuming improperly smoked fish (18.2%) or improperly sun-dried fish (12.1%). Most respondents smoked the fish (84.9%) in cut-out drum kilns (78.8%) using firewood (63.6%). Most preserved the smoked fish on drying racks placed over the kilns (68.7%). A majority reported receiving nutrition and food safety information in the past 30 days (55.6%), yet 39.3% did not respond to the follow-up question about this information's source. Most had engaged in fish processing ≥3 years (78.8%) and had access to clean water at their processing site (82.8%). Yet only 10.1% practiced handwashing with soap during fish handling/processing and only 36.4% reported using protective gloves during fish handling/processing.

CONCLUSIONS

Educating fish processors about entry points through which processed fish are contaminated can improve the safety of fish/fish products, leading to less foodborne illness in Nigeria.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 49 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP49_01

IMPACT OF ECONOMIC DISPARITY ON PREGNANCY WEIGHT GAIN IN A LMIC COUNTRY

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BACKGROUND AND OBJECTIVES

Optimal weight gain in pregnancy is considered an important parameter determining the maternal and neonatal outcomes globally (1,2). These nutritional parameters are confounded by socioeconomic standards leading to further aggravation of health inequalities in LMICs. This study aimed to see the association of wealth index with pregnancy weight gain in a cohort of mothers from Sri Lanka.

METHODS

A retrospective cohort study was conducted among 1875 mothers who delivered term live babies during 2022/2023 period. A stratified cluster sample was used to represent three residential sectors equally. Data was collected from pregnancy records and by interviewing mothers. The wealth index was calculated using household ownership of selected assets, materials used for housing construction, and types of water access and sanitation facilities. Impact of economic disparity measured by wealth index, on pregnancy weight gain was assessed by using the Lorenz curves and calculation of Gini coefficient.

RESULTS

Of the total sample, 62.4% mothers had inadequate weight gain, while 9.8% had excess weight gain. There was no significant difference in the mean pregnancy weight gain among wealth quintiles or residential sector ($p>0.05$). However, the Gini coefficient for percentage of mothers with adequate weight gain over economic quintiles was 0.46.

CONCLUSIONS

The Gini coefficient is higher than the generally accepted value of 0.4, indicating some inequality in pregnancy weight gain among wealth quintiles. This could lead to disparities in the resultant maternal and neonatal outcomes based on wealth standards. The intervention planning needs to be targeted accordingly.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP49_02

EFFECTS OF MECHANICAL STIMULATION ON MUSCLE HYPERTROPHY IN ADULT AND AGING MICE

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BACKGROUND AND OBJECTIVES

Sarcopenia is a progressive loss of muscle mass and strength with age. With no drugs available, nutrition and exercise are the only available strategies to slow its progression by maintaining muscle mass. Preserving muscle mass primarily relies on inducing muscle usage or movement, typically through exercise. However, for those unable to exercise intensively, alternative approaches are needed. This study explored mechanical massage or stimulation (MS) as a potential alternative approach to induce muscle movement and enhance muscle hypertrophy.

METHODS

A commercially available massage gun, adapted from massage devices used in previous studies (1,2), was used as the MS device. Tibialis anterior (TA) muscles of adult (8-week-old) and aging (18-month-old) mice were injured by cardiotoxin (CTX, 10 μM) injection. At 4 days post-injury, the injured muscles were subjected to MS treatment for 7 days (2 min twice a day), followed by recovery until 28 days post-injury. This injury-MS treatment-recovery cycle was repeated to further induce muscle hypertrophy. Histochemical and immunofluorescent analyses were used to assess muscle morphology and myofiber types.

RESULTS

In adult mice, MS treatment enhanced muscle hypertrophy, as evidenced by an increase in regenerating myofiber size (2769.32 ± 303.40 μm² [no MS] vs. 3480.25 ± 138.17 μm² [MS], $p = 0.0588$), a greater amount of large myofibers (>3001 μm², $p < 0.05$), a lower amount of small myofibers (<3000 μm², $p < 0.05$), and an increased fusion index. In contrast, in aging mice, MS treatment did not show those hypertrophic effects. When analyzing the number of regenerating myofibers in the whole regenerating muscle, muscle hypertrophy significantly increased the number of regenerating myofibers in adult mice but failed in aged mice. However, with MS treatment, a significant increase in the number of regenerating myofibers was observed in both adult and aging mice, indicating its potential for promoting muscle hypertrophy in aging. MS treatment shifted myofiber types in regenerating adult and aging muscles, reducing type IIB and increasing type IIX (aging) and IIA (adult) myofibers.

CONCLUSIONS

MS treatment following injury enhances muscle hypertrophy in adult mice and shows potential in aging mice, suggesting it as a novel approach to promote muscle growth and prevent sarcopenia.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP49_05

PREDICTORS OF STUNTING IN YOUNG CHILDREN IN A VULNERABLE POPULATION: INFLUENCE OF PARENTAL HEIGHTS

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BACKGROUND AND OBJECTIVES

Nutrition is a core development indicator in any country. However, there are vulnerable populations such as those living in tea and rubber plantations (estate sector) in Sri Lanka, where there is a higher rate of undernutrition in children. The prevalence of stunting have declined from 2006 to 2016, with specific interventions and for further reduction it is necessary to explore parental factors that have had generational effects (1,2). The objective of this study is to determine the influence of parental height as a predictor of stunting in children aged 12-23 months, in the estate sector Sri Lanka.

METHODS

Children aged 12-23 months and born during 2022/23 in the estate sector were studied. A sample of 636 term-born children was assessed. Heights and weights of children and their mothers and fathers were measured. Other data were obtained by interviewing mother and from health records. Stunting was defined as HAZ<-2.0 according to WHO growth standards.

RESULTS

In the sample majority of mothers were less than 35 years of age, and belonged to the poorer weight quintiles. Of the children, 20.8% had a birth weight less than 2.5 kg. Currently 28.5% of children were stunted (HAZ<-2.0), and 12.3% were wasted (WHZ<-2.0). The prevalence of stunting was higher among boys, those born with a low birth weight, born at lower gestational age, having persistent growth faltering during 4 to 5 months and not having minimum dietary diversity. Mean maternal heights in stunted and non-stunted children were 150.1 cm and 153.1 cm, ($p<0.001$) and paternal heights were 163.6 cm and 165.8 cm ($p<0.001$), respectively. Multivariate regression analyses revealed maternal and paternal heights as significant predictors of stunting independent of sex, birth weight and age categories.

CONCLUSIONS

Maternal and paternal heights determine linear growth failure in children in estate sector after adjusting for sex, age, birth weight category. Maternal and paternal height are often used as indicators of genetic potential for height. If both parents are shorter, their children may have a lower potential height, regardless of environmental factors. While the parental heights play a role in determining child growth potential, environmental factors are modifiable and need to be addressed and improved to reach each child's 'fullest' potential.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP49_06

SYSTEMATIC REVIEW AND META-ANALYSES ON THE EFFECTS OF ASPARTAME ON GLUCOSE, INSULIN AND APPETITE-REGULATING HORMONES

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BACKGROUND AND OBJECTIVES

Controversy around the role of aspartame (E951) in healthy diets, physical health and non-communicable disease continues [1-3]. Some of this controversy is based on some proposed actions of aspartame on appetite regulation [2,3]. This work sought to systematically identify and summarize all studies investigating an effect of aspartame on glucose, insulin and appetite-regulating hormone responses.

METHODS

Following registration of our protocol (PROSPERO ID: CRD42024540781), five academic databases and four trial registries were searched over all years of records, and supplemented with additional searches, to identify as many relevant articles as possible. Search hits were screened by two independent reviewers, and data were subsequently extracted for all included articles and combined.

RESULTS

Our searches were completed from June – Sept. 2024. Systematic processes resulted in the identification of 101 articles of relevance to our research questions. These articles reported on 100 different experiments, 79 of which lasted for less than 1 day in duration, 8 experiments lasted 2-30 days and 13 experiments lasted for more than 30 days. Ninety experiments involved healthy adults, 3 experiments included adults with aspartame sensitivity and 12 experiments involved adults with compromised glucose metabolism in the form of diabetes mellitus. Experiments varied widely in aspartame provision and comparator/s, and while almost all assessed glucose and/or insulin responses, few experiments investigated other appetite-regulating hormones. Meta-analyses of acute crossover studies revealed little to no effects of aspartame on glucose or insulin responses when compared with vehicle or other low-calorie sweeteners (LCS), and lower blood glucose and insulin levels when compared with sugars, other carbohydrates or other nutritive elements. Over the medium-term, effects were reduced and became inconsistent. In long-term studies, no effects of aspartame consumption were found, but high heterogeneity between studies remained. Comparable effects were also found in those with aspartame sensitivity and compromised glucose metabolism.

CONCLUSIONS

Our findings suggest little to no effects of aspartame consumption on glucose metabolism over the short- or longer-term. Further studies over the long-term, investigating a range of appetite-regulating hormones, and comparing aspartame with other LCS would be of value.

CONFLICTS OF INTERESTS

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SOAP49_07

ASSOCIATIONS BETWEEN GESTATIONAL WEIGHT GAIN AND BIRTH OUTCOMES IN AMHARA, ETHIOPIA

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BACKGROUND AND OBJECTIVES

Suboptimal gestational weight gain (GWG) is a measure of poor pregnancy health and fetal growth, and may lead to adverse pregnancy outcomes. There is limited data on this association from low-income settings.

METHODS

We conducted secondary analysis of a randomized controlled pragmatic effectiveness study of balanced energy protein supplementation in rural Amhara, Ethiopia (ISRCTN15116516). Pregnant women were enrolled at ≤24 weeks gestational age and followed up at monthly antenatal care visits until birth. Total GWG was calculated as weight from enrollment until last ANC visit, and the weekly GWG rate as the total GWG divided by the number of weeks between first and last weight measure. GWG was categorized into tertiles (reference: lowest GWG group). The associations between GWG and birth outcomes were tested using logistic regression for dichotomous outcomes of low birth weight (<2500g), small-for-gestational age (SGA), large-for-gestational age (LGA), and stillbirth, and linear regression for continuous outcomes of length, weight, length-for-age (LAZ), and weight-for-age z-scores (WAZ). Multivariate models adjusted for maternal enrollment gestational age (GA) and weight, imbalanced baseline covariates, and clustering by health center.

RESULTS

Women in the highest tertile of GWG rate had lower odds of delivering a low birth weight (Odds Ratio [OR]=0.54 [95% CI: 0.30, 0.99]) or SGA baby (OR=0.46 [95%CI: 0.35, 0.61]), compared to those in the lowest tertile. Infants born to women in the top tertile of GWG rate had higher infant birth weight (123 g (95%CI: 63, 183]), LAZ (0.25 z (95%CI: 0.03, 0.48)), and WAZ (0.42 z, 95%CI: 0.31, 0.52). There was no association with stillbirth and length.

CONCLUSIONS

Higher total GWG and GWG rate were associated with lower odds of low birthweight and SGA, and higher birthweight, LAZ and WAZ in rural Ethiopia.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP49_08

WORKPLACE BREASTFEEDING SUPPORT IN LOW- AND MIDDLE-INCOME COUNTRIES: A SCOPING REVIEW OF LITERATURE SINCE 2016

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BACKGROUND AND OBJECTIVES

Despite global efforts to improve breastfeeding rates, workplace support remains a significant barrier, particularly in low- and middle-income countries (LMICs) where 85% of the global population resides. While workplace breastfeeding support has been well-studied in high-income countries, evidence from LMICs remains limited and fragmented, compromising maternal and child health outcomes and threatening global breastfeeding targets.

Objective: To comprehensively map the landscape of literature on workplace breastfeeding support in LMICs published since the 2016 Lancet Breastfeeding Series, examining the extent, range, and nature of available research.

METHODS

A systematic scoping review following PRISMA-ScR guidelines was conducted. Five electronic databases were searched for literature published between January 2016 and December 2024. The World Bank's income classification was used to determine LMIC status. Initial search yielded 20,696 articles, with 157 articles meeting inclusion criteria after thorough screening.

RESULTS

Preliminary RESULTS: Analysis of 108 articles reveals a steady increase in publications from 5 articles in 2016 to 19 in 2023. Studies span 24 countries, with strongest representation from Indonesia (13), Ghana (11), Brazil (10), and South Africa (8). Research methodologies evolved from predominantly quantitative studies in 2016-2019 to a more diverse methodological landscape by 2020-2024, including increased qualitative and mixed-METHODSapproaches. Key research themes included workplace facility assessment, maternity leave policy impacts, implementation of support programs, and cost-effectiveness analyses. Recent years show increased attention to informal sector workers and policy implementation studies.

CONCLUSIONS

While findings demonstrate growing research interest and methodological diversity in LMIC workplace breastfeeding support, significant gaps remain in informal employment contexts, multi-stakeholder perspectives, and intervention impacts. Urgent action is needed to generate context-specific evidence for effective policy and practice in LMICs.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP49_09

THE ASSOCIATION BETWEEN PATERNAL PRECONCEPTION BMI AND EARLY CHILDHOOD NUTRITIONAL RISK, A LONGITUDINAL COHORT STUDY

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BACKGROUND AND OBJECTIVES

The Developmental Origins of Health and Disease (DOHaD) theory has highlighted that parental characteristics during preconception have been associated with child's health and chronic diseases risks across the life course. While preconception research predominately focuses on maternal influence on offspring nutritional outcomes, the role of fathers remains underexplored. This study aimed to investigate the associations between paternal preconception BMI and child nutritional risk, including dietary intake and eating behaviors.

METHODS

This longitudinal cohort study included children aged 18 months to 5 years recruited from The Applied Research Group for Kids (TARGet Kids!), a primary care research network in Ontario, Canada. Nutritional risk was assessed using the Nutrition Screening for Every Preschooler/Toddler (NutriSTEP®), a parent-reported validated questionnaire. Two NutriSTEP® subscales—dietary intake and eating behaviors—were also analyzed. Mixed-effects models were employed to examine the relationship between paternal preconception BMI and child nutritional risk while adjusting for covariates, including paternal age, education, ethnicity, and family income. Child sex and age group were tested as effect modifiers.

RESULTS

A total of 146 children with 314 repeated NutriSTEP® observations were included, with a mean (SD) NutriSTEP® total score of 10.99 (5.27). The mean (SD) paternal preconception BMI was 26.82 (3.93), with 63.51% of fathers classified as overweight or with obesity (BMI ≥25 kg/m²). Higher paternal preconception BMI was positively associated with the NutriSTEP® total score (β = 0.25, 95% CI: 0.04–0.45, p = 0.02) and the dietary intake subscore (β = 0.15, 95% CI: 0.04–0.26, p = 0.006). After adjusting for potential confounders, the association for the dietary intake subscore did not change in a meaningful way (β = 0.12, 95% CI: 0.01–0.23, p = 0.03). RESULTS did not differ in any clinically substantial way by child sex or age group.

CONCLUSIONS

Higher paternal preconception BMI may be linked to poorer dietary intake in children, highlighting the potential importance of paternal health in early childhood nutrition and growth trajectories. Further evidence on paternal health needs to inform preconception care guidelines and early-life interventions to promote healthier behaviors in families.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP49_10

USERS' PERCEPTIONS OF FOOD CHOICES AND PURCHASING BEHAVIOR IN FOOD/BEVERAGE DELIVERY APPS

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BACKGROUND AND OBJECTIVES

The use of meal delivery apps (MDAs) represents an important phenomenon that is still poorly understood in terms of its influence on individuals' food choices. The aim of this study was to understand perceptions covering influences on food choices and food/beverage purchasing behavior in MDAs.

METHODS

This is a qualitative study with 11 users of food/beverage delivery apps (≥18yrs; 18.2% men) who took part in an online Focus Group (FG) via the Google Meet web conferencing platform. The participants were selected by public invitations in the digital sphere and included individuals from each of the five regions of Brazil: North, Northeast, Midwest, South and Southeast. Transcription was carried out in Microsoft Office, with audio checking and exploratory reading, and thematic analysis was used, generating the following themes: food availability, cost and desirability, based on the theoretical framework of the digital food environment (DFE) dimensions. The research was approved by the Research Ethics Committee of the State University of Ceará (#6.542.4).

RESULTS

The FG was conducted synchronously and lasted 78 minutes. The availability of food was related to the diversity of types of ready-to-eat food and the possibility of eating what is not prepared at home, ranging from healthy foods to combos that were cited as unhealthy options (pizza and sandwiches with soft drinks). Convenience was perceived as the ease of ordering ready-made food at any time, saving time and effort, especially on days when meals are not planned at home. Cost was perceived in relation to price and marketing, with emphasis on promotional items, accumulation of points and rewards with purchases, being an aspect pointed out as influencing the purchase of food/beverages. Desirability was associated with the intention to buy items that generate feelings of pleasure and emotional compensation when eating.

CONCLUSIONS

This study highlighted the need for public policies and regulations aimed at the digital food environment in order to increase the supply and sale of healthy food at affordable prices and reduce the rewards and benefits associated with unhealthy food. Actions are also needed to deal with the complexity of obstacles in home meal preparation that favor the acquisition of unhealthy items by MDAs.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP49_12

Malnutrition in children under 1 in Afghanistan- a mixed-METHODSstudy to explore causes and needs of children and caregivers

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BACKGROUND AND OBJECTIVES

Malnutrition in children is very high in Afghanistan, and the situation has worsened in recent years (1, 2). More than 45% of malnourished children accessing MSF health facilities in Herat were aged less than 6 months in 2022. However, the causes of malnutrition in children under 1 were unclear. The aim of this work was to identify and explore the causes and the needs of moderately and severely malnourished children aged 0-11 months living in Herat Province and neighboring provinces by caregivers and health care workers.

METHODS

To achieve this, we conducted a mixed METHODSstudy in two phases, including program data from the health facilities in Herat (Afghanistan) collected between August and September 2022, and in-depth interviews with caregivers of malnourished and non-malnourished children, and key informants conducted between January and June 2023.

RESULTS

Two hundred fifty-nine questionnaires were analyzed. Fifty-four percent of the malnourished children accessing MSF health facilities were girls. Sixty-seven percent of the mothers reported to breastfeed their children under 1 at the time of the interview, however they thought that the time was inadequate or the quantity of milk inappropriate. Only 18% of the mothers exclusively breastfed their child in the first six months of life. More than half (64%) of the mothers perceived to not have enough food to eat for them, and 21% for their children. Poverty, unemployment and schools closure were perceived as the main key drivers contributing to the decrease of women empowerment with a direct effect on young child nutrition. Caregivers reported that young children's diet was poor and very limited in fruits and vegetables. Women reported to not be supported while caring for their children, including for breastfeeding. Additionally, mothers said to be malnourished during pregnancy, and feel depressed and lonely since the beginning of the pregnancy.

CONCLUSIONS

This work contributes to the field of global public health and nutrition in a prolonged crisis context. Insights from our research include: 1) Strengthening education, and health promotion on breastfeeding and child nutrition, including Infant and Young Child Feeding (IYCF) experts and local nutritionist, 2) supporting mothers to breastfeed longer and exclusively in the first six months of life, and 3) guaranteeing psychological support to women before and after pregnancy to prevent maternal depression, and better look after their babies.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP49_13

ULTRA PROCESSED FOOD, NUTRIENT INTAKE AND RISK OF ADVERSE PREGNANCY OUTCOMES

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BACKGROUND AND OBJECTIVES

Maternal nutrition in pregnancy has an influence on both short and long-term health outcomes of mother and child. Ultra-Processed Food (UPF) intake was previously associated with lower dietary quality, additionally concerns have been raised regarding the potential presence of endocrine-disrupting chemicals (EDCs) in UPF. Anogenital distance can serve as a marker for endocrine disruption in-utero.

METHODS

A cohort of 290 mothers was enrolled between March-2023 and December-2024, and followed for one month postpartum. Data collection included sociodemographic and lifestyle questionnaires, a Food Frequency Questionnaire (FFQ) modified to enhance measurement accuracy of food processing, clinical data and anogential distance (AGD) measurements. Maternal urine and milk samples were collected one month postpartum. The NOVA classification was used to classify foods by their degree of processing and mothers with high UPF intake in terms of percent of energy (eUPF) and percent of total food weight (wUPF) were compared to those with low intake.

RESULTS

Of 204 mothers completing the questionnaires those in the top quartile of eUPF (Q4) consumed 41% compared with 21% in quartiles 1-3 (Q1-3), and wUPF-Q4 consumed 19% vs. 6% in Q1-3. eUPF-Q4 mothers were more likely multipara (72% vs. 55%) had assisted or c-section delivery (35% vs. 18%) and a higher birth weight (BW) infant (mean$\pm$sd: 3415$\pm$398 vs. 3272$\pm$389 g) compared to Q1-3 ($p<0.05$ for all). Energy intake was similar but eUPF-Q4 mothers consumed more carbohydrates, and less potassium, vitamin C, folate and % energy from protein, ($p<0.05$ for all). More mothers in the wUPF-Q4 were underweight (8% vs. 5%) or obese (14% vs. 4%) compared to wUPF-Q1-3 ($p<0.05$). Male infants born to eUPF-Q4 mothers had a shorter average anopenile distance than those born to Q1–Q3 mothers (46.5±10.6 vs. 49.6±7.1 mm), but the difference was not significant ($p = 0.2$). In a model controlling for pre-pregnancy BMI, maternal age, infant BW and week of birth, for every 1% increase in eUPF the risk for assisted or c-section delivery increased by 5%.

CONCLUSIONS

UPF consumption was associated with unfavorable dietary profile and with adverse pregnancy outcomes. Associations with markers of endocrine disruptions were not statistically significant and require further research.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP49_15

WEIGHT GAIN DURING KEY DEVELOPMENTAL PERIODS AND BIOLOGICAL AGE ACCELERATION IN YOUNG ADULTHOOD: EVIDENCE OF SEX-SPECIFIC ASSOCIATIONS IN A YOUNG FILIPINO COHORT

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BACKGROUND AND OBJECTIVES

Epigenetic clocks [ECs] use DNA methylation to estimate biological age. Biological age acceleration [AgeAccel] predicts morbidity and mortality. Low birth weight and high adiposity in adolescence and adulthood are associated with AgeAccel. We aimed to test the association of weight gain relative to growth trajectory with AgeAccel estimated by commonly-used ECs and their combination at age 21yrs in a young Filipino population.

METHODS

We used data from the Cebu Longitudinal Health and Nutrition Survey from 1983 to 2005 (n=1,745, 47% female). Relative weight gain [RWG] during key time intervals (0-6mo, 6mo-1yr, 1-2yrs, 2-8.5yrs, 8.5-11yrs, 11-15yrs, 15-18yrs, and 18-21yrs) was represented by standardized residuals derived from regressing weight on all previous weight and height (length up to 2yrs) measurements and concurrent height. AgeAccel was represented by six ECs: Horvath, Hannum, PhenoAge, GrimAge, DNA methylation estimator of telomere length [DNAmTL], and Dunedin Pace of Aging [DunedinPACE]. We also created FactorAge using factor analysis of these six ECs. We used multivariate regression to test the association of relative weight gain and AgeAccel. Adjusted models included the following covariates: smoking, average lifetime household wealth index, white blood cell proportions, and parity and total months breastfeeding in females. Final analyses were stratified by sex and adjusted for multiple comparisons using the Benjamini-Hochberg method.

RESULTS

In males, we found statistically significant associations between RWG 6mo-1yr and Hannum, DNAmTL, DunedinPACE, and FactorAge, and between RWG 11-15yrs and Hannum, GrimAge, PhenoAge, and FactorAge in unadjusted models. In adjusted models, one standard deviation [1SD] RWG 11-15yrs corresponded to 0.07 (95% CI: 0.01, 0.14) SD FactorAge. In females, we found statistically significant associations between RWG 11-15yrs and PhenoAge, DunedinPACE, and FactorAge and RWG 18-21 and all ECs, except Horvath in unadjusted models. In adjusted models, 1SD RWG 11-15 yrs was associated with 0.09 (95% CI: 0.04, 0.15) DunedinPACE and 1SD RWG 18-21yrs – with 0.08 (95% CI: 0.01, 0.15) SD FactorAge and 0.10 (95% CI: 0.04, 0.15) SD DunedinPACE, respectively.

CONCLUSIONS

We did not find associations between gaining weight faster than expected given growth trajectory in childhood and AgeAccel at 21yrs, but our RESULTS support the association of recent weight gain and AgeAccel in early adulthood in females. Inquiries into the timing of puberty may elucidate the association between RWG 11-15yrs and AgeAccel in males.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP49_16

EXAMINATION OF FOOD SECURITY AND NUTRITION SECURITY STATUS BY DEMOGRAPHIC VARIABLES AMONG PARTICIPANTS IN THE SPECIAL SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS AND CHILDREN (WIC) IN VENTURA, CA, USA

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BACKGROUND AND OBJECTIVES

The definition of food security (FS) is a household's ability to have access at all times to enough food for an active, healthy lifestyle (ERS, 2024). The concept of nutrition security (NS) expands this understanding by going beyond the concept of adequacy and assessing a household's ability to obtain foods that meet their nutrition and health needs and dietary preferences, considering dietary quality, affordability and food safety (CNHI, 2025). The objective of this study is to examine the relationship between food and nutrition security and identify the specific risk and protective factors that can be attributed to FS and NS among a population of low-resourced women and their families participating in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), living in Ventura, CA.

METHODS

In addition to providing demographic data, study participants (n=984) were administered the 6-item, U.S. Food Security Survey Module (USDA, 2024) and the Center for Nutrition in Health Impact (CNHI, 2025) Food and Nutrition Security Related Measures as part of a cross-sectional study examining usage of WIC Farmers Market Nutrition program benefits. Descriptive and bivariate analyses were conducted to examine the association between demographics and food and nutrition security. Multinominal logistic regression was used to further explore demographics and nutrition security-related measurement predictors for food and nutrition security.

RESULTS

A total 20.9% of study participants reported experiencing both food insecurity and nutrition insecurity (FI/NI), 1.5% reported experiencing FS and NI (FS/NI), 39.7% reported experiencing FI and NS (FI/NS), and 37.8% reported experiencing FS and NS (FS/NS). Language, educational attainment, race, income level, and household size were associated with the four categories of food and nutrition security ($P<0.05$). Multinomial analyses showed that those who reported earning <$20,000/year had 0.279 (CI:0.097, 0.802) times lower odds of being FS/NS compared to those who made >$60,000/year. English speakers also had 0.518 (CI: 0.313, 0.858) times lower odds of being FS/NS versus Spanish speakers.

CONCLUSIONS

Further studies are needed to identify protective factors that prevent food and nutrition insecurity among people in low-resource settings, which can inform program and policy strategies to address food access and food quality for low-resourced populations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 52 - PUBLIC HEALTH AND NUTRITION THROUGHOUT LIFE CYCLE

SOAP52_01

LONG-TERM EFFECTS OF MULTIPLE MICRONUTRIENT SUPPLEMENTATION DURING PREGNANCY, LACTATION, AND EARLY CHILDHOOD ON COGNITIVE DEVELOPMENT: SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

Biological and environmental factors like inadequate nutrition, poor health care, and suboptimal environmental motivation limit early childhood development and academic potential. Evidence shows that maternal micronutrient supplements (MMS) improve birth outcomes, and micronutrient powders (MNPs) enhance anemia and iron levels in children aged 2–12, but their impact on cognition remains unclear. This systematic review evaluates the long-term cognitive effects of maternal MMS and early childhood point-of-use MNPs on children aged 4–14 years in low- and middle-income countries.

METHODS

We conducted a systematic search of published articles using the following databases: MEDLINE (PubMed), EMBASE, CENTRAL (Cochrane Library), Web of Science, CINAHL, SCOPUS, and Google Scholar. The review included randomized controlled trials that evaluated the long-term effects of maternal MMS and MNPS during early childhood on cognitive, motor, and behavioral development in children and adolescents aged 4–14 years. Search records were exported to EndNote and subsequently imported into Covidence. Covidence was used to remove duplicates, conduct title and abstract screening, and data extraction.

RESULTS

A total of 8,815 records were identified through six databases and grey literature searches. Ten studies were included in the systematic review: six focused on maternal supplementation during pregnancy, three on early childhood interventions, and one on both. In addition to cognitive development, five studies reported on motor development, and five studies on behavioral development and mental health. Most studies were conducted in Asia, with one reporting on two interventions in Tanzania and another in Peru. The included studies were (cluster)-randomized controlled trials, with sample sizes ranging from 184 to 2,879 participants. Although most findings were not statistically significant, the two largest studies on maternal MMS using the UNIMMAP formulation suggested potential long-term benefits for children's cognitive development. There were concerns regarding power of several studies to show a meaningful difference. Evidence on point-of-use MNPs during early childhood was insufficient to draw definitive CONCLUSIONS about their effects or absence of effects.

CONCLUSIONS

Maternal MMS during pregnancy and lactation did not show significant long-term effects on child development. However, few studies suggested potential associations with cognitive development. Overall, evidence on the long-term effects of maternal MMS and the point-of-use MNPs on cognitive development is limited, emphasizing the necessity for further research.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP52_02

NUTRITION CARE PROCESS IMPLEMENTATION AND ASSOCIATED DETERMINANTS IN THE SCANDINAVIAN REGION; AN INIS 2023 UPDATE STUDY

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BACKGROUND AND OBJECTIVES

The Nutrition Care Process (NCP) and Terminology (NCPT) is globally recognized as a standardized model that facilitates good nutritional practices and outcome evaluation in clinical nutrition care. According to our previous INIS (International Nutrition Care Process and Terminology Implementation Survey) study from 2017, regular use of the NCP among Scandinavian dietitians ranged from 40% to 56%, while terminology implementation was lower (16-36 %). The INIS 2023 Update Study aims to build on the previous study to provide an updated picture of the Nutrition Care Process implementation and associated determinants among registered dietitians in the Scandinavian region.

METHODS

This cross-sectional study employed a convenience sampling approach to electronically distribute validated questionnaires to 461 registered dietitians in Denmark, Norway and Sweden. Extent and length of NCP implementation were assessed and scores categorized into five levels ranging from "very low implementation" to "very high implementation". Attitudes were assessed with the respondents indicating their agreement with statements on a Likert scale between 1-5. Participants were also asked to indicate implementation barriers and enablers. Descriptive statistics, together with chi-square and Kruskal Wallis tests were computed for the categorized and continuous variables.

RESULTS

In this 2023 update study, 59% of respondents reported high NCP (process) implementation and 37% indicated high NCPT (terminology) use. Sweden consistently showed higher process and terminology implementation, followed by Denmark and Norway. A high median score (4-5) of respondents NCP/NCPT attitude was reported. Key enablers of NCP/NCPT implementation included the presence of a designated leader (61-80%), sufficient practice time (67-86%), electronic health record (EHR) support (63-90%), and conducive workplace settings. Barriers varied by country: Norway faced challenges with limited financial support (71%) and knowledge gaps (69%); Sweden cited lack of time (78%) and training (81%); while Denmark highlighted insufficient training (73%) and limited management support (74%).

CONCLUSIONS

NCP Implementation appear to have increased slightly overtime, while still terminology use remains implemented to a lower extent compared to the working process. Given the variation in barriers across countries, tailored strategies are needed to address different regional needs.

CONFLICTS OF INTERESTS
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SOAP52_04

THE EFFECT OF HEALTHY DIETARY INTERVENTIONS ON PHYSICAL ACTIVITY, SCREEN TIME, AND SLEEP IN ADULTS WITH OVERWEIGHT OR OBESITY

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BACKGROUND AND OBJECTIVES

Diet quality is a key determinant of obesity risk. Prior evidence suggests that dietary interventions may also impact lifestyle behaviors, such as physical activity, sleep duration and sedentary behavior. Hence, understanding the relationship between diet quality and lifestyle behaviors is of utmost importance to create effective strategies to manage weight gain and improve overall health. Our aim was to evaluate the impact of three dietary interventions on lifestyle factors in participants with overweight or obesity during a 12-week randomized controlled trial.

METHODS

A randomized controlled trial was conducted with 45 participants recruited at baseline, of whom 37 completed the 12-week intervention. Participants were randomly assigned to one of three dietary interventions: a calorie-restricted Mediterranean diet, a low-carbohydrate diet, or a high-protein diet. Lifestyle factors, including physical activity, sleep duration, and screen time, were assessed using questionnaires administered before and after the intervention. Mean values for lifestyle factors were calculated for both pre- and post-intervention periods, and t-tests were used to assess mean difference.

RESULTS

Participants in the calorie-restricted Mediterranean diet and low-carbohydrate diet groups showed significant improvements in physical activity and reductions in screen time after the intervention. The Mediterranean diet group increased physical activity by 1825.9 METs/week (p=0.001), while the low-carbohydrate diet group increased it by 146.5 METs/week (p=0.01). Screen time was reduced by 25.9 minutes/day (p=0.002) in the Mediterranean diet group and by 54.74 minutes/day (p=0.001) in the low-carbohydrate diet group. No changes were observed in sleep duration.

CONCLUSIONS

Adherence to healthy dietary interventions, such as the calorie-restricted Mediterranean diet and the low-carbohydrate diet, have positive effects on lifestyle factors, such as physical activity and screen time, even though they were not the primary focus of the intervention. Although no significant changes were observed in sleep duration, these findings highlight the potential for dietary interventions to influence multiple aspects of lifestyle, which may contribute to improved health outcomes in individuals with overweight or obesity.

CONFLICTS OF INTERESTS
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SOAP52_06

DIETARY BEHAVIOUR OF PREGNANT WOMEN IN ETHIOPIA: THE MISSING ASPECT OF CARE

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BACKGROUND AND OBJECTIVES

Nutrition and adequate dietary intake have a profound impact on both maternal health and the physical and cognitive development of the fetus [1,2] Understanding the determinants that shape dietary behaviour of pregnant women is essential for promoting healthy diets during pregnancy. Dietary behaviour refers to all phenomena related to food choice, eating behaviour and dietary intake [3,4].

METHODS

A mapping review was conducted using three databases, including studies published between 2000 and 2022. An innovative adapted socio-ecological framework [5] integrated with the UNICEF framework on maternal and child nutrition[6] was employed to categorize emerging factors.

RESULTS

A total of 68 factors influencing dietary behaviour of pregnant women were identified The focus was at the intrapersonal/individual (31/68) and the interpersonal/household (21/68) level, while factors at the community (11/68) and the institutional level (5/68) were scarce. We identified a research gap concerning the various aspects of care for women, particularly in relation to socio-cultural aspects, such as gender roles, decision-making power and workload of women, psychological factors and eating practices related to food taboos. None of the studies investigated the influence of resources at institutional level.

CONCLUSIONS

The focus in maternal nutrition is still placed on the individual responsibility of women, instead of addressing the structural conditions that would enable women access to resources such as land and education. Further research should consider the interconnections of factors at all levels of the socio -ecological framework and place an emphasis on care for women and healthy environments.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP52_07

RISK FACTORS ASSOCIATED WITH UNDERNUTRITION AMONG 6- TO 23-MONTH-OLD RURAL INFANTS AND YOUNG CHILDREN IN A DISTRICT OF HELA PROVINCE IN PAPUA NEW GUINEA: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

Inadequate complementary feeding contributes to children's undernutrition, widespread issues affecting child health in Papua New Guinea (PNG). Internationally recommended infant and young child feeding (IYCF) practices, about which little are known in PNG, promote healthy nutritional status. This cross-sectional study aimed to characterize children's diets and explore associations between complementary feeding behaviors and indicators and child, caregiver and other characteristics and child undernutrition.

METHODS

Health-facility-based interviews provided information from a convenience sample of 144 caregiver-child pairs of 'healthy' children aged 6-23m and caregivers (94% mothers) aged 14-37y in rural areas of one Hela province district. Anthropometric measurements (lengths and weights) of the children were also performed according to standard procedures. WHO/UNICEF caregiver and child food groups consumed yesterday were elicited and IYCF Indicators calculated to understand child diets. Pearson's chi-square tests assessed associations between IYCF Indicators and other household characteristics and behaviors and undernutrition (stunting, underweight and wasting).

RESULTS

Stunting, underweight, and wasting were found in 36.8, 11.1 and 6.9% of the children, respectively. IYCF Indicators were unsatisfactory, with minimum dietary diversity achieved by only 24 (16.7%), minimum meal frequency by 38 (26.4%) and minimum acceptable diet by 12 (8.3%) children. Sweet potatoes, other vegetables, instant noodles and oil were the most commonly eaten foods by both children and caregivers. Stunting was associated with having grandmother or other adoptive caregiver (p=0.024), longer walk time to health center $\geq$2h (p=0.009), father not residing continuously at home (p=0.047), ZVF consumption (p=0.016). Underweight was associated with less educated fathers (p=0.024), caregivers having >1child under 2y (p=0.015), female sex (17.3%girls vs 7.3%boys; p=0.015). Wasting was associated with early ISSSF (p=0.006).

CONCLUSIONS

Very suboptimal complementary feeding with inadequate dietary diversity and feeding frequency, few Vitamin A-rich vegetables and animal proteins offered evidence to guide urgently needed targeted IYCF nutrition-specific interventions to improve IYCF practices and nutritional status of children aged 6-23 months in rural Hela province. Potential exists for improvement through evidence-based integrated approaches disseminating IYCF guidelines.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP52_09

SCALING UP ANTENATAL MULTIPLE MICRONUTRIENT SUPPLEMENTATION (MMS) IN AFRICA: A POSITION PAPER

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BACKGROUND AND OBJECTIVES

Maternal undernutrition in Africa remains a significant public health challenge,contributing to negative pregnancy outcomes, neonatal mortality, andperpetuating intergenerational cycles of poor health. Antenatal MultipleMicronutrient Supplementation (MMS), a cost-effective intervention recognizedglobally for its potential to improve maternal and neonatal health, reduces risks oflow birth weight, preterm birth, small for gestational age, and stillbirth whileoffering a $37 return for every $1 invested. Despite its benefits, MMS adoptionacross African countries remains suboptimal. This position paper synthesizes theoutcomes of the 2nd Africa Maternal Nutrition and MMS Technical Meeting: A PathToward Introduction and Scale-up of MMS in Africa, held in Nairobi, Kenya, fromthe 16th to 18th of October, 2024.

METHODS

The 3-day meeting convened more than 100 government representatives from 17 African member states, in addition to donors and experts, to align on a shared vision for MMS introduction and scale-up in Africa. We have analyzed the key messages of every activity of the meeting, including panels, presentations (from global experts and country representatives), and individual interviews, resulting in key recommendations.

RESULTS

The participants emphasized MMS integration into antenatal care (ANC) as a cornerstone of maternal nutrition strategies and identified actionable recommendations to overcome policy, supply chain, financing, and implementation barriers. The six key recommendations include 1) leveraging global advocacy opportunities (e.g., through a full endorsement of MMS by WHO), 2) adopting country-specific approaches for effective implementation of MMS, 3) building government ownership to ensure long-term sustainability, 4) strengthening the supply chain to ensure MMS availability aligns with national strategies and demand forecasts, 5) sharing knowledge and resources (comprehensive tools and funding mechanisms for MMS), and 6) integrating MMS into ANC services and community-based delivery platforms to ensure that MMS is not introduced or delivered as a stand-alone intervention.

CONCLUSIONS

Key messages of this position paper include the urgency of scaling MMS, the role of implementation science in tailoring programs to local contexts, and the need of regional collaboration to share lessons and facilitate progress. An additional "Call to Action" was established to provide a detailed roadmap to guide stakeholders in scaling up MMS as an urgent priority to enhance maternal and neonatal health, advance gender equality, and fulfill Africa's global health commitments.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP52_10

EATING BREAKFAST DURING ADOLESCENCE HAS A POSITIVE IMPACT ON BODY MASS INDEX IN ADULTHOOD

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BACKGROUND AND OBJECTIVES

Overweight/obesity is a major worldwide public health concerns, closely linked to adolescent dietary habits. Although the importance of breakfast skipping is widely recognized, a significant proportion of adolescents tend to skip this meal, which may have long-term consequences on their body mass index (BMI). The primary aim of this study was to assess the influence of adolescent breakfast habits on adulthood BMI. The secondary aim was to assess the influence of adulthood breakfast habits on BMI and cardiovascular risk.

METHODS

A nested cohort of 182 adolescents (12.5 to 17.5 years) were clinically reassessed at adulthood (22 to 31 years). Four European centers took part in the study: Ghent (Belgium), Lille (France), Roma (Italy) and Zaragoza (Spain). Breakfast habits were collected at adolescence and adulthood during 3 days from 24-hour dietary recalls. BMI and cardiovascular factors such as PDAY (Pathobiological Determinants of Atherosclerosis in Youth risk score), and its blood parameters (HDL-cholesterol, Hb1Ac) were collected at adulthood. Data were analyzed using mean comparison and ANCOVA test, adjusted for age, gender, centers and socioeconomic status, with SPSS™ software. No artificial intelligence was used

RESULTS

Adulthood BMI was significantly lower: 23.05 ± 4.19 *kg/m2* (n=105) for adolescent who ate breakfast in adolescence comparing to whom did not: 25.58 ± 5.41 *kg/m2* (n= 45; p=0.003). PDAY, HDL-C and HbA1c were significantly lower in adulthood who ate breakfast both actually and during adolescence.

CONCLUSIONS

The lowest and favorable adulthood BMI were obtained for adolescent who ate breakfast daily in adolescence. Adults who ate breakfast both daily and during adolescence exhibit better cardiovascular factors. This study shown the beneficial role of eating breakfast for preventing overweight/obesity and cardiovascular health early in life.

CONFLICTS OF INTERESTS
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SOAP52_11

DETERMINANTS OF MALNUTRITION IN MALAWI: AN ETHNOGRAPHIC STUDY

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BACKGROUND AND OBJECTIVES

In Malawi, 37% of children under five are stunted, and only 36% are developmentally on track. The Nurturing Care Framework identifies five domains that children need to survive and thrive: safe and nutritious food; responsive care; good health; learning opportunities and safety and security. The goal of this study was to understand the complex drivers of caregiving behaviours across the five nurturing care domains in the Ntcheu and Balaka districts of Malawi to inform multi-sectoral stunting prevention programmes.

METHODS

An ethnographic study using the Reality Check Approach was conducted in 12 rural households which all included a pregnant woman or a child under 2 years. Researchers immersed themselves in these households for four days and nights, gathering information through informal conversations, participation in daily activities, observations, and group sessions focused on specific topics, to understand current caregiving behaviours and the factors driving these behaviours. The data was analysed using a grounded theory and Framework Analysis Approach.

RESULTS

The study revealed that children in the four locations studied are not receiving the nurturing care they needed to grow and develop to their full potential. Key issues identified include poor maternal, child, and family diets; inadequate infant and young child feeding; poor hygiene; low utilization of health and nutrition services; and limited child stimulation and learning opportunities. These problems are influenced by chronic poverty, food insecurity, climate crises, gender inequality, poor maternal mental health, and low access to and quality of services.

CONCLUSIONS

The research underscores the need for a multi-sector approach to improve maternal and child nutrition and development. It also stresses the importance of understanding the contextual determinants of caregiving behaviours to inform multi-sector programmes and policies to prevent malnutrition. Without addressing these determinants, caregiving practices will not improve, and countries like Malawi will struggle to meet their SDG health, nutrition, and development targets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP52_12

TRENDS IN FOOD CONSUMPTION IN INDIA: INSIGHTS FROM HOUSEHOLD CONSUMPTION EXPENDITURE SURVEYS (HCES)

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BACKGROUND AND OBJECTIVES

In the past decade, India has witnessed notable changes in food consumption patterns, propelled by economic growth, urbanization, and a heightened focus on nutritional awareness. Utilizing unit-level data from the household consumption expenditure survey (HCES) 2011-12 and 2022-23, this study aims to analyse the changes in consumption patterns of fresh fruits, dairy products, flesh products, vegetables, and cereals.

METHODS

We use a multi-level random effects model to estimate the average quantity of a particular food group consumed per adult female equivalent (AFE) in 30 days. We further assess variations in food consumption over time, across sectors, consumption classes, states, and survey months. Our analytical sample includes 257,905 and 99,785 households from HCES 2022-23 and 2011-12, respectively, with available data on monthly per capita expenditure and cooking arrangements.

RESULTS

The RESULTS indicate a significant increase in the consumption of fresh fruits, meat, fish, eggs, and dairy products, accompanied by reduced cereal consumption across rural and urban areas. We also find significant state-wise variations and seasonal patterns.

CONCLUSIONS

These findings suggest that the evolving consumption patterns are likely to have significant implications for the agricultural sector nationwide, especially in terms of farmers' crop selection. Policymakers should emphasize on sustainable agricultural practices to support these changes and improve health outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP52_13

INTEGRATED APPROACHES TO PREVENT MALNUTRITION UNDER FIVE YEAR CHILDREN IN LOW- AND MIDDLE-INCOME COUNTRIES

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BACKGROUND AND OBJECTIVES

Malnutrition remains a critical public health challenge in Low- and Middle-Income Countries (LMICs), significantly contributing to morbidity and mortality. The 2018 National Nutrition Survey (NNS) highlighted Pakistan's triple burden of malnutrition, with 40.2% of children experiencing stunting, 17.7% suffering from wasting, and 28.9% classified as underweight, with Sindh exhibiting the highest prevalence of wasting (23.3%). To address this, a gender-responsive, community-based intervention was implemented to enhance service accessibility and improve nutritional outcomes.

METHODS
METHODSA community-based approach was implemented to provide primary healthcare including maternal and child outpatient care, immunization, and malnutrition management. Key activities included mass screenings, simplified treatment protocols, awareness campaigns, MIYCN counseling, breastfeeding support, and referrals to Nutrition Stabilization Centers (NSCs). Ready-to-use therapeutic food was provided to children, while pregnant and lactating women (PLW) and adolescent girls received iron and folic acid supplementation. Early Childhood Development (ECD) initiatives and community engagement strategies, such as family support groups and nutrition festivals, were also integrated.
RESULTS

Between December 2023 and May 2024, 54,792 children and 20,736 pregnant women were screened, identifying 2,327 severely malnourished children, of whom 126 were referred to Nutrition Stabilization Centers (NSCs). Additionally, 11,121 children were immunized, 5,216 received treatment under Integrated Management of Neonatal and Childhood Illness (IMNCI) protocols, and 11,190 pregnant women and 3,968 adolescents received Iron and Folic Acid supplementation. Community outreach efforts engaged 26,252 individuals through support groups, provided ANC, IYCF, and PNC counseling to 29,105 women, and raised awareness among 79,145 individuals through sessions and 153,535 via FM radio broadcasts. A total of 659 children were identified through family-led MUAC screening, with caregivers trained on MUAC measurement. Additionally, 20 focus group discussions were conducted to assess community perceptions and improve intervention strategies.

CONCLUSIONS

The project demonstrated the effectiveness of integrating preventive and curative measures, with community engagement playing a vital role in early identification, timely interventions including immunization uptake. Sustainable, long-term, and scalable strategies are essential to further reduce malnutrition and enhance child health outcomes in LMICs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP52_14

THE COST OF A NUTRIENT ADEQUATE DIET RELATIVE TO INCOME IN THE PHILIPPINES

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BACKGROUND AND OBJECTIVES

The 2030 Sustainable Development Goal (SDG) 2 ('End hunger, achieve food security and improved nutrition and promote sustainable agriculture') highlights the importance of food security. Previous research developed a food security metric, the Cost of Nutrient Adequacy (CoNA) (Bai et al, 2021). We aimed to benchmark the CoNA in the Philippines relative to the expenditure on food per capita per day.

METHODS

The Philippines Household Income and Expenditure Survey from 2018, containing income and food purchases of a nationally representative sample of 147,718 households, for 1 year, was utilized. Purchases were mapped to local retail prices and nutrient composition. The CoNA was defined as the least-cost diet meeting requirements for energy and nutrients for women of reproductive age.

RESULTS

The CoNA was 3.57 Int$, and was driven largely by vitamin D, followed by potassium and calcium. The average expenditure on food per capita per day ranged from 1.98 Int$ (lowest income quintile) to 3.84 Int$ (highest income quintile). A constraint was then added to include rice (a fortified food) to achieve a more realistic diet. This resulted in the CoNA increasing by 43% as up to 320g (2 servings) a day of rice were included.

CONCLUSIONS

The CoNA remains out of reach for all but the wealthiest, with vitamin D being the most expensive nutrient followed by potassium. The affordability of micronutrients partially explains the deficiencies in this country and highlights the need for fortification beyond the current programs. Fortification may ultimately contribute to the realization of SDG 2.

CONFLICTS OF INTERESTS

All authors are employees of Nestlé Research. Nestlé was not involved in the study, analysis, interpretation of data or the writing of this abstract or the decision to submit it for publication. All authors declare no other competing interest.

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SOAP52_16

NUTRIENT ADEQUACY RATIO (NAR) AND MEAN ADEQUACY RATIO (MAR) OF ESSENTIAL AMINO ACID INTAKE OF STUNTED AND NORMAL CHILDREN

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BACKGROUND AND OBJECTIVES

Amino acids be the emerging nutrients that hypothesized to be associated with linear growth when many studies found that protein intake is considerably adequate and micronutrient intervention showed an unsatisfactory effect for linear growth improvement. Moreover, the prevalence of stunting in the food producing area are common, left the question on how is the intake of the children. A comparative cross-sectional study aimed to compare amino acid intake between stunted non-wasted (SNW) and non-stunted non-wasted (NSNW) children aged 12-23 months living in a rural agricultural area with high prevalence of stunting

METHODS

Nine-days self-estimated food record was applied to collect the amino acid intake of 151 children. The amino acid food databases from Japan food composition tables were incorporated. Nutrient Adequacy Ratio (NAR), a measure that expresses an individual's intake of a nutrient as a percentage (capped at 100%) of the corresponding recommended allowance for the amino acid, given the respondent's age and sex and mean adequacy ratio (MAR) calculated by averaging the NAR that quantifies the overall nutritional adequacy of a population based on an individual's diet using the current recommended allowance for a group of nutrients of interest was calculated.

RESULTS

The RESULTS showed that NAR and MAR of the essential amino acid using the prescriptive body weight of normal children tends to be higher than stunted children eventhough all essential amino acid requirement were met in both groups and no statistically diferences between groups.

CONCLUSIONS

This RESULTS lead to the question whether the current amino acid intake recommendation is still relevant for children living in deprived hygiene sanitation environment and where the enteric enteropathy disorder (EED) might be prevalent. The EED might resulted to not all the ingested amino acids can be absorbed and enter the blood stream as significant amounts of dietary amino acid are catabolized by enterocytes during first-pass metabolism and not effectively used for the growth of the children.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 02 - NON COMMUNICABLE DISEASES

SOAP02_05

OVERWEIGHT AND OBESITY AMONG SCHOOL CHILDREN IN A CORRELATION WITH BODY COMPOSITION AND PHYSICAL ACTIVITIES

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BACKGROUND AND OBJECTIVES

Since the early adolescent years is a critical period to prepare children for the growth spurt associated with puberty, it is essential to understand the effects of nutritional status on growth potential. This study investigates the relationship between body composition, bone mineral density, and physical activity levels in 10-year-old children, focusing on overweight and obesity (O&O) status. The objective is to identify potential intervention strategies to reduce the burden of overweight and obesity while optimizing physical health in children.

METHODS

Children aged 10 years from three elementary schools in an urban area of Vietnam were assessed for nutritional status. A total of 120 children with a Body mass index-for-age (BAZ) score > 1 were categorized into the O&O group, while 120 children with $-1 \leq BAZ \leq 1$ were classified as the normal weight group. Body composition and bone mineral density (BMD) were evaluated using Dual-Energy X-ray Absorptiometry (DXA). Physical activity levels were monitored using GeneActive accelerometers worn on the wrist for one week.

RESULTS

Both O&O and normal weight children exhibited BMD levels lower than the age-specific average, with O&O children showing higher whole-body and leg BMD compared to their normal-weight peers (0,76 and 0,90 compared to 0,73 and 0,84 g/cm). The O&O children also had a higher body fat score and a lower lean score compared to the normal-weight group (2,47 to 2,01 and -3,44 to -4,36). In terms of physical activity, O&O children engaged in an average of 4.5 minutes of moderate- to vigorous-physical activity (MVPA) per day, while normal-weight children averaged 8.7 minutes per day. Notably, girls have very limited time participated in MVPA, only 1.9 minutes per day (O&O group) and 1.4 minutes per day (normal-weight group). O&O boys had significantly less MVPA than normal-weight boys (13.7 minutes versus 15.8 minutes per day).

CONCLUSIONS

This study suggests that urban children in Vietnam may face multiple health risks due to poor body composition and sedentary lifestyles. Both O&O and normal-weight children failed to achieve adequate BMD with the O&O group demonstrated higher level. In addition, both groups are still not in desirable body composition range for either fat or lean mass. Despite a school regimen requiring physical activity per 45-minute class, none of the children reached the World Health Organization's recommendation of 60 minutes of MVPA per day. These findings underscore the need for further evaluation of body composition and the promotion of physical activity in schools to prevent O&O and to enhance the well-being of adolescents.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP02_07

INTERMITTENT FASTING DOES NOT IMPACT SLEEP QUALITY RELATIVE TO AD LIBITUM EATING IN OVERWEIGHT/OBESE ADULTS - A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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BACKGROUND AND OBJECTIVES

Overweight and obesity can result in poorer sleep quality and a significantly increased risk of developing obstructive sleep apnea (OSA), an additional risk factor for cardiovascular disease. Intermittent fasting (IF) regimens offer a less prescriptive, alternative strategy to improve weight and cardiometabolic health markers. While weight loss through caloric restriction and lifestyle modifications can improve sleep quality, the specific effect of IF, which may independently influence circadian rhythms, has not been previously investigated. This systematic review and meta-analysis assessed the independent effects of IF on sleep and cardiometabolic outcomes associated with OSA risk among adults with overweight/obesity (PROSPERO ID: CRD42024539606).

METHODS

A literature search was performed up to May 2024, and identified 12 randomized controlled trials (18 comparisons and 928 participants) that reported on sleep outcomes and compared IF (n=9 time-restricted eating (TRE); n=3 alternate-day modified fasting (ADMF)), versus *ad libitum* eating. Random effects meta-analyses were performed for primary (PSQI global score and sleep efficiency) and secondary outcomes (sleep duration, anthropometric measures, daily energy intake and blood pressure). Subgroup analyses were conducted based on IF mode/length of eating window.

RESULTS

Compared to *ad libitum eating*, IF produced a significantly greater reduction in weight (Mean difference: -2.2 kg; 95% CI: -3.0, -1.5), BMI (-0.7 kg/m2; -0.9, -0.4), fat mass (-1.5 kg; -1.9, -1.1), waist circumference (-2.4 cm; -3.2, -1.6), daily energy intake (-267 kcal; -404, -129), systolic (-1.6 mmHg; -2.8, -0.3) and diastolic blood pressure (-1.5 mmHg; -2.6, -0.4). Despite this, there were no changes from baseline for sleep quality, efficiency, or duration ($p>0.05$). Subgroup analyses showed greater reductions following ADMF and 6h-TRE for weight, BMI and fat mass (6h-TRE only) compared to 10h-TRE ($p<0.05$). Sleep quality was only assessed as a secondary outcome in 11/12 studies.

CONCLUSIONS

Compared to *ad libitum* eating, IF reduced body weight and improved cardiometabolic markers with no independent beneficial or detrimental effects on sleep quality. This data supports IF as an alternative option to continuous energy restriction in populations with obesity and sleep disorders, such as OSA. Larger clinical trials with sleep measures as primary outcomes are required to better understand whether IF regimens can benefit overall sleep hygiene.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP02_08

FOOD-BASED INDEXES FOR ASSESSING DIET QUALITY IN RELATION TO CHRONIC INFLAMMATION

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BACKGROUND AND OBJECTIVES

Chronic inflammation is associated with increased risk of non-communicable diseases, a major global health concern. Intensified interest in the diet-disease relationship has led to extensive research assessing dietary inflammatory potential. Diet quality indexes are used to quantify dietary patterns, however, the optimal tool for assessing dietary inflammation remains undetermined. This review aimed to comprehensively summarise and evaluate food-based indexes and their association with chronic inflammation.

METHODS

A systematic literature search of databases was conducted up to March 2024, to identify studies that (i) described the development and validation of original dietary-inflammation indexes or (ii) assessed associations between existing indexes and inflammatory biomarkers. Heat maps were developed to highlight foods and food groups across indexes.

RESULTS

Forty-three dietary indexes, evaluated across 65 studies, were categorised into four distinct groups: original dietary-inflammation indexes (n=6), and those based on dietary patterns (n=18), dietary guidelines (n=14), or therapeutic diets (n=5). Fruits, vegetables, whole grains, and legumes were consistently classified as favourable (anti-inflammatory), while red/processed meats and added sugars tended to be classified as unfavourable (pro-inflammatory). However, there was inconsistency in inclusion of some foods. Indexes based on the Mediterranean diet and dietary guidelines were the most extensively utilised, demonstrating inverse associations with inflammation across diverse populations. In addition, the Anti-Inflammatory Diet Index (AIDI), Dietary Inflammation Score (DIS), and Empirical Dietary Inflammatory Index (EDII) represent robust food-based indexes to assess dietary inflammatory potential. Inter-correlation analyses revealed strong correlations among multiple indexes associated with reduced inflammation.

CONCLUSIONS

This review identified several validated food-based indexes for assessing diet quality in relation to inflammation, with some consistency between algorithms. However, methodological variations in index development and utilisation, highlight the need for further validation studies. Future research should focus on examining diverse populations and inflammatory biomarkers, dietary composition, scoring methods, and validated outcomes, when selecting indexes to assess diet-inflammation relationships. Understanding the underlying basis and characteristics of each index should inform their use in nutrition research and clinical practice.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP02_09

A HEALTHY BRAZILIAN DIET WITH ENERGY RESTRICTION IMPROVES ANTHROPOMETRY AND MODULATES SALIVARY AND GUT MICROBIOTA IN ADULTS WITH EXCESS BODY WEIGHT

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BACKGROUND AND OBJECTIVES

Energy-restricted diets are associated with various physiological benefits, including excess body weight and metabolic health improvements. This study explores the effects of a healthy, energy-restricted, Brazilian diet low in ultra-processed foods on anthropometric parameters and alterations in intestinal and salivary microbiota diversity and composition.

METHODS

This is a secondary analysis based on a randomized clinical trial involving 59 adults, male and female, with excess body weight (BMI ≥ 27 kg/m²) (Ethics Committee approval: 6.197.412; REBEC registration: RBR-9832wsx). Participants followed a diet rich in typical Brazilian *in natura* and minimally processed foods, with -500 kcal/day from their total energy requirement. Salivary and gut microbiota were analysed through 16S rRNA gene of the V4 region. Alpha diversity (Chao 1, Simpson, and Shannon indices) and beta diversity (Bray-Curtis dissimilarity) were calculated. Differential analysis to identify discriminant taxa between baseline and endpoint used generalized linear mixed models (FDR < 0.1).

RESULTS

After the intervention, weight loss averaged -2.7 kg (-4.3 – -1), accompanied by reductions in BMI of -1 kg/m² (-1.5 – -0.4), waist circumference of -2.4 cm (-4.5 – -0.7), and hip circumference of -2.5 cm (-4.5 – -0.2), as well as decreases in body fat of -2.1 kg (-3.8 – -0.9), all <0.001. No significant changes on muscle mass were observed (-0.2 kg [-1.6 – 0.6], p=0.089). Alpha diversity of the salivary microbiota significantly increased at the ASV level (Simpson index, p = 0.037). In the faecal microbiota, Chao 1 increased at amplicon sequence variants (ASV) (p = 1.7e-06), genus (p = 6.2e-05), and species (p = 4.2e-05) levels, and the Shannon index increased at ASV (p = 0.005) and species (p = 0.014) levels. No significant changes were observed in the Bacillota/Bacteroidota ratio in either salivary (p = 0.17) or gut (p = 0.95) microbiota. Differential analysis revealed a decrease in pathogenic, pro-inflammatory bacteria in the salivary microbiota (e.g., *Selenomonas* and *Campylobacter*). In gut microbiota, a significant increase was observed in genera associated with short chain fatty acid production and anti-inflammatory effects (e.g., *Adlercreutzia* and *Catenibacillus*).

CONCLUSIONS

A healthy, Brazilian diet low in ultra-processed foods combined with energy restriction promoted significant weight loss and induced a beneficial microbial shift in both salivary and gut microbiota, key contributors to improve metabolic health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP02_10

PLANT-BASED DIETARY INDICES AND RISK OF A FIRST CLINICAL DIAGNOSIS OF CENTRAL NERVOUS SYSTEM DEMYELINATION IN AUSTRALIAN ADULTS

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BACKGROUND AND OBJECTIVES

The role of diet and risk of MS is of growing interest to the scientific and MS community. We aimed to test associations between plant-based indices and the likelihood of a first clinical diagnosis of central nervous system demyelination (FCD), a common precursor to the diagnosis of MS.

METHODS

We used data from the 2003–2006 Ausimmune Study, a case-control study conducted in four regions of Australia (1). Adult participants were recruited as cases if they had an FCD within the study period (n=282); controls (n=558) were randomly selected from the general population. Participants with complete dietary data and total energy intake ranging from 500 to 3,500 kcal/day for women and 800 to 4000 kcal/day for men (2) were included in the current analysis (264 cases, 474 controls). A validated semiquantitative FFQ was used for the dietary assessment (3). Three plant-based indices were calculated from the FFQ: 1) plant-based dietary index (PDI); 2) healthy plant-based dietary index (hPDI); and 3) unhealthy plant-based dietary index (uPDI). Each index comprised 18 food groups, further divided into three broader food categories, specifically healthy plant foods (whole grains, fruit, vegetables, nuts, legumes, tea and coffee), unhealthy plant foods (fruit juices, refined grains, potatoes, sweets and desserts) and animal foods (animal fat, dairy, egg, fish, seafood, meat) (4). Logistic regression was used to test associations between each plant-based index, food category, and likelihood of FCD. Model 1 was adjusted for age, study region and sex. Model 2 was additionally adjusted for education, history of infectious mononucleosis, smoking history, serum 25-hydroxyvitamin D concentration, total energy intake and dietary misreporting.

RESULTS

A weak positive association was found between uPDI and risk of FCD in model 1 (OR: 1.02; 95% CI: 1.00, 1.05; P-value: 0.041). However, in the fully adjusted models, there were no associations between plant-based indices nor food categories and the likelihood of FCD.

CONCLUSIONS

Our findings suggest no associations between plant-based diets and the likelihood of FCD. Whether these findings are consistent across populations is unknown; associations could be tested in other cohorts to help elucidate any role of plant-based dietary patterns in MS risk.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP02_11

THE EFFECT OF ISOMALTULOSE INTAKE ON GLP-1 RESPONSE IN THE GENERAL POPULATION AND PARTICIPANTS WITH IMPAIRED GLUCOSE TOLERANCE/T2D: SYSTEMATIC REVIEW AND META-ANALYSIS

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BACKGROUND AND OBJECTIVES

The incretin hormone glucagon-like peptide-1 (GLP-1) is crucial for maintaining glucose homeostasis and promoting satiety. Isomaltulose (Palatinose™), a slowly digestible carbohydrate, has been shown to enhance GLP-1 release compared to high-glycaemic index (HGI) carbohydrates. A consolidated evaluation of this evidence is lacking. Therefore, this systematic review and meta-analysis aimed to synthesize available data on isomaltulose and GLP-1 response.

METHODS

A systematic search of EMBASE and MEDLINE (PubMed) was conducted to identify randomized controlled trials comparing acute GLP-1 secretion after the intake of isomaltulose versus HGI carbohydrates from inception to 01 December 2024. Studies combining isomaltulose with other functional substances were excluded. Following screening process, a total of seven studies fulfilled the inclusion criteria and were included, while four studies were excluded. The standardized mean difference (SMD) was used to synthesize the pooled effect size using a random effects model with inverse-variance method.

RESULTS

Isomaltulose significantly increased GLP-1 secretion compared to HGI carbohydrates [SMD: 1.29; 95% confidence interval (CI): 0.72, 1.85; n=147; P=0.0004] with a low degree of heterogeneity ($I2$=33%; P=0.13). Subgroup analysis based on health status showed that isomaltulose significantly increased GLP-1 secretion in both apparently healthy subjects (SMD: 1.25; 95% CI: 0.32, 2.19; n=88; P=0.02) and those with impaired glucose tolerance/ type 2 diabetes (SMD: 1.35; 95% CI: 0.36, 2.34; n=59; P=0.02), compared with HGI carbohydrates.

CONCLUSIONS

Replacing HGI sugars and carbohydrates with isomaltulose consistently enhances GLP-1 secretion irrespective of subject´s health status. These findings highlight the use of Palatinose™ (isomaltulose) as a beneficial carbohydrate ingredient for nutritional products supporting weight management.

CONFLICTS OF INTERESTS

LS is an employee of BENEO GmbH / Suedzucker Group.ST is an employee of BENEO GmbH / Suedzucker Group.YCZ is an employee of BENEO GmbH / Suedzucker Group.

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SOAP02_12

Adherence to a traditional Chinese diet and its association with non-communicable diseases and mortality: RESULTS from the China Health and Nutrition Survey

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BACKGROUND AND OBJECTIVES

Two-thirds of deaths were related to non-communicable diseases (NCDs). Traditional diets may reduce the risk of NCDs. This study aimed to firstly investigate the impact of adherence to the traditional Chinese diet (TCD) on NCDs and all-cause mortality.

METHODS

This study utilised data from the China Health and Nutrition Survey, a prospective cohort study conducted across multiple waves, with data collected between 1997 and 2011 selected for analysis. Eligible participants were aged 18 to 74 years, had participated in at least two survey waves, and had no known NCDs at baseline. Adherence to the TCD was assessed using a recently developed TCD index, based on three 24-hour recalls data collected within this cohort. Outcomes included obesity, central obesity, hypertension, diabetes, cancers, cardiovascular diseases (CVDs), and all-cause mortality. Multilevel logistic regression models were used to analyse the longitudinal associations between TCD adherence and NCD-related outcomes; multivariable Cox regression was utilised to assess the relationship between TCD adherence and all-cause mortality.

RESULTS

A total of 11,219 adults were followed for a median of nine years. In the fully adjusted analysis, high, compared to low, TCD adherence, was associated with higher odds of obesity (OR:1.20, 95%CI:1.03-1.37) and central obesity (OR:1.13, 95%CI:1.05-1.21), but lower odds of hypertension (OR:0.82, 95%CI:0.67-0.97) and CVDs (OR:1.20, 95%CI:0.68-0.96). Additionally, in the adjusted multivariable model, high, compared to low, TCD adherence was associated with a reduced risk of all-cause mortality (HR:0.56, 95%CI:0.50-0.64).

CONCLUSIONS

High TCD adherence was associated with lower odds of hypertension and CVDs, as well as reduced risk of all-cause mortality, but with higher odds of obesity.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP02_13

WHICH STAKEHOLDERS INFLUENCE THE DEVELOPMENT AND IMPLEMENTATION OF FOOD PROMOTION AND PROVISION POLICIES IN GHANA'S URBAN SCHOOL SYSTEMS?

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BACKGROUND AND OBJECTIVES

Children/adolescents in Ghana experience a double burden of malnutrition driven in part by unregulated exposure to unhealthy food promotion (FProm) and provision (FProv) in schools. This study aimed to identify which key national stakeholders influence the development and implementation of FProm and FProv policies in Ghana's Urban School Systems.

METHODS

A Net-Map interview method was employed. It involved two group interviews with purposefully selected participants with working experiences in FProm and FProv. Through interactive questioning, stakeholders and their connections (command, advocacy, technical assistance, funding), influence (0=not influential at all, 5=highest level of influence), and relevant opinion leaders were identified. A social analysis software (VisuaLyzer version 2.2) was used to analyse the network characteristics and visualize the Net-Map.

RESULTS

The FProm Network encompassed 22 stakeholders, 29 connections and a high centralization (96%), comprising 2 core and 20 peripheral stakeholders. Key influencers included the Nutrition and Health Promotion Units of Ghana Health Service (GHS), the Food and Drugs Authority (FDA), and the media. World Vision and non-governmental organizations which support government and academic institutions were funding stakeholders. The FDA exercises formal authority, while the GHS, FDA, and Ministry of Gender, Children and Social Protection (MGCSP) lead advocacy and technical assistance efforts. Twenty-seven stakeholders and 46 connections were identified from the FProv Net-Map. The network centralization was 94% comprising 4 core and 23 peripheral stakeholders. The most influential stakeholders were the Ministry of Education (MoE), the Ghana School Feeding Program (GSFP), the Ministry of Food and Agriculture (MOFA), and GHS. United Nations agencies (UNICEF and WFP) and the Department of Children of MGCSP were funders. Government agencies FDA, MoE, Ghana Education Service, and MOFA, provided formal authority. Government agencies were the main providers of information (advocacy, technical assistance and dissemination) to NGOs and the private sector.

CONCLUSIONS

Influential government stakeholders were identified for the FProm network (GHS and FDA) and the FProv network (GHS, MoE, GSFP and MOFA). These influential government agencies demonstrate high centralization and control [FProm-96%; FProv-94%]. This highlights their central roles in leadership, policy formulation and programme implementation in addressing NCD control among children/adolescents in Ghana's Urban School Systems.

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CONFLICTS OF INTERESTS

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SOAP02_14

ASSOCIATION OF OVERWEIGHT/OBESITY, SARCOPENIA, AND SARCOPENIC OVERWEIGHT/OBESITY WITH HYPERTENSION IN THE ELDERLY: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

Sarcopenia, sarcopenic obesity, and hypertension are increasingly significant public health challenges worldwide. This study aimed to investigate the association between overweight/obesity, sarcopenia, sarcopenic overweight/obesity and hypertension among elderly participants and explored its influencing factors.

METHODS

This cross-sectional study included 834 participants. Based on measured values of muscle strength, skeletal muscle mass, and body mass index (BMI), the participants were categorized into four groups: overweight/obese, sarcopenia, sarcopenic overweight/obese and normal. Univariate and multiple logistic regression models were used to examine the relationships.

RESULTS

The mean age of the participant was 72.66 years (SD: 5.66), the BMI was 24.97 kg/m2 (SD: 3.30). The prevalence of hypertension was 68.47%. The prevalence of overweight/obesity, sarcopenia, sarcopenic overweight/obesity were 53.36%, 6.24%, and 10.67%, respectively. There were significant differences in age, BMI, waist circumference, muscle strength, physical function, and body composition variables. In the adjusted model for age, gender, other social demographic characteristics, health behavior variables, sarcopenia (OR: 2.60; 95% CI: 1.24–5.42), overweight/obesity (OR: 2.43; 95% CI: 1.74–3.39) and sarcopenic overweight/obesity (OR: 2.26; 95% CI: 1.29–3.98) were significantly associated with hypertension. The RESULTS of the multivariate logistic regression revealed that age and waist circumference maintained a significant association with hypertension. The findings from the restricted cubic splines regression analysis indicated that there is a linear positive correlation between age and hypertension for individuals aged 60 to 78.04 years, and age-adjusted waist circumference exhibited a linear positive association with hypertension.

CONCLUSIONS

This study demonstrated that overweight/obesity, sarcopenia and sarcopenic overweight/obesity are all significantly correlated with hypertension.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP02_15

ADOLESCENT DIETARY PATTERNS AND RISK OF CHRONIC LIVER DISEASE MORTALITY AND INCIDENT LIVER CANCER: A PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES

Healthy dietary patterns in adulthood have been associated with favorable liver health, but no study has examined the role of the adolescent diet in adverse liver outcomes. We evaluated the relationship between adolescent dietary patterns and the risk of chronic liver disease mortality and liver cancer in adulthood.

METHODS

We analyzed data from the NIH-AARP Diet and Health Study, a prospective cohort study, comprising 241,628 adult participants who had recalled their dietary intake at ages 12-13. (mean: 61 years). We employed principal component analyses to derive dietary patterns based on 37 food items from the food frequency questionnaire. We used the Cox proportional hazards regression model to estimate the multivariable HRs and 95% CIs for associations between different dietary patterns and adverse liver outcomes with adjustments for potential confounders including adult and adolescent characteristics.

RESULTS

With a median of 15.5 years follow-up, we documented 437 chronic liver disease deaths and 419 incident liver cancers. We identified three dietary patterns: a plant-based pattern (high in fruits and vegetables), a Western modern pattern (high in ice cream and doughnuts, but low in milk and vegetables), and a Western traditional pattern (high in hot dogs and French fries, but low in milk and butter). After controlling potential confounding factors, the adolescent Western modern pattern score was positively associated with the risk of chronic liver disease mortality (HR quartile 4 vs quartile 1=1.40, 95% CI=1.06-1.86, P trend=0.05). None of the dietary patterns during adolescence were associated with liver cancer risk.

CONCLUSIONS

For the first time we found a positive correlation between Western modern patterns during adolescence and mortality from chronic liver disease. If confirmed by future research, these findings crucially inform the significance of a healthy adolescent diet in preventing liver disease.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 05 - NON COMMUNICABLE DISEASES

SOAP05_01

Does vitamin E in mono-supplementation affect the risk of heart failure? RESULTS of a systematic review

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BACKGROUND AND OBJECTIVES

The role of vitamin E (α-tocopherol) in cardiovascular (CV) health remains controversial despite its potential to prevent oxidative damage. Previous cohort studies have suggested an association between vitamin E intake and reduced CV events, yet randomized controlled trials (RCTs) have not consistently shown a beneficial effect on CV morbidity or mortality. This systematic review aims to assess the effect of vitamin E supplementation on the incidence of heart failure (HF).

METHODS

We conducted a comprehensive literature search in MEDLINE, Embase, and the Cochrane Library databases, adhering to the PRISMA guidelines (PROSPERO Reg. number CRD42024554076). RCTs in adults that compared any form of α-tocopherol in mono-supplementation to placebo (parallel, crossover, or factorial designs) and reported on HF incidence (i.e. non-fatal HF, hospitalisation, or death) were eligible. The internal validity of the studies was assessed using a customized version of the Office of Health Assessment and Translation Risk of Bias (RoB) tool.

RESULTS

Five independent RCTs met the inclusion criteria. Two RCTS were judged at low RoB and three at moderate RoB. A meta-analysis was not performed due to the heterogeneity of the studies in terms of HF outcomes, participant baseline characteristics, and vitamin E doses. Two RCTs conducted in high CV risk populations indicated an increased incidence of HF with vitamin E supplementation at doses of 268-273 mg/day. No significant effect was observed in RCTs involving participants with low or no prevalent CV disease. Variations in the impact on left ventricular ejection fraction (LVEF) were noted across studies, suggesting a potential differential effect on HF with reduced ejection fraction (HFrEF) versus HF with preserved ejection fraction (HFpEF).

CONCLUSIONS

Vitamin E supplementation could increase the risk of incident HF among patients with existing, or at high risk of, ischemic heart disease, particularly affecting LVEF and potentially increasing the risk of HFrEF. No effect was observed in populations with low CV risk profiles. These findings highlight the necessity for careful consideration of vitamin E supplementation in individuals at risk for HF. However, data is limited, and further research is warranted to explore the differential effects of supplemental vitamin E on HF subtypes and to clarify the underlying mechanisms.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP05_02

THE EFFECT OF ALMONDS ON MENTAL HEALTH AND GUT HEALTH: A 12-WEEK RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Whole dietary interventions may reduce symptoms of depression and anxiety, but adherence can be difficult. Single-food interventions like almonds may improve adherence. Almonds contain micronutrients associated with cognitive benefits and have a prebiotic effect on the gut microbiome. This randomised controlled trial assessed the effects of whole almonds on mental and gut health in adults with mild to moderate symptoms of depression and anxiety.

METHODS

Adults aged 18-45y with Patient Health Questionnaire Anxiety and Depression (PHQ-ADS) scores of 10-29 were randomised to 56g/d whole almonds (intervention) or two iso-caloric muffins/d (control) for 12 weeks. Symptoms of depression/anxiety (primary outcome) were assessed via the PHQ-ADS. Functional impairment, mental wellbeing, psychological distress and gastrointestinal symptoms were measured with validated questionnaires. Group differences were analysed using linear mixed models.

RESULTS

Eighty-four participants (mean age 25 y, BMI 23 kg/m², 76% female, 46% white ethnicity) were randomised. Almonds had no significant impact on depression/anxiety, mental wellbeing, or psychological distress, versus control (Table 1). However, almonds significantly reduced functional impairment and led to lower reports of hard stools (Table 1). No differences were observed in other gastrointestinal symptoms.

Table 1. Mental Health and Gastrointestinal Symptoms (mean, SD)

	Almonds (n = 40)		Control (n = 41)		p-value at endpoint
	Baseline	Endpoint	Baseline	Endpoint	
Depression and anxiety	16.0 (5.2)	11.6 (5.3)	16.3 (5.1)	12.5 (5.3)	0.42
Functional impairment	13.8 (5.2)	9.42 (5.2)	13.7 (5.11)	12.3 (5.3)	0.05
Mental wellbeing	40.9 (12.8)	53.2 (13.0)	39.7 (12.7)	52.0 (13.0)	0.98
Psychological distress	24.0 (4.9)	20.0 (5.0)	24.4 (4.9)	21.5 (5.0)	0.43
Hard stools	0.23 (0.2)	0.11 (0.2)	0.24 (0.2)	0.27 (0.2)	<0.001

CONCLUSIONS

While almonds did not significantly reduce symptoms of depression/anxiety compared to control, they improved functional impairment and reduced hard stools, suggesting potential benefits for gut dysfunction. Microbiome and short-chain fatty acid analyses are ongoing.

CONFLICTS OF INTERESTS

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SOAP05_04

IS EXTREME OBESITY ASSOCIATED WITH UNHEALTHY AND UNMANLY TESTOSTERONE LEVELS?

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BACKGROUND AND OBJECTIVES

Obesity is one of the risk factors for lower testosterone level in men. Given the fundamental role of sex hormones in regulating body composition, energy homeostasis, and reproduction in humans, more emphasis should be placed on the potential role of androgen dysregulation in the pathophysiology of various obesity phenotypes and metabolic syndrome. Low testosterone by itself increases adiposity, creating a self-perpetuating cycle of cardiometabolic complications. Obesity-associated hypogonadism is mostly functional and reversible, but substantial weight loss is needed. This study aims to observe the relationship between BMI, and testosterone levels in patients with extreme obesity attending a weight loss program in the outpatient clinic at the Biomedical Research Center.

METHODS

This interventional study involved 16 men with extreme obesity (EO) with an average age of 37.7 ± 10.0 years, and a body mass index (BMI) of 50,0 ± 10,6 kg/m² presenting to the Diabetes outpatient department. Eleven healthy men without obesity were controls (mean age was 31.0 ± 15.5 years and BMI 25,4 ± 2,3 kg/m²). Body composition, metabolic parameters, and testosterone levels were measured before and after the intervention (weight loss program).

RESULTS

At baseline total testosterone (TT) levels were significantly lower in patients with obesity in comparison to controls (5,9 ± 3,4 vs. 20,0 ± 7,0 nmol/l, $p < 0.001$). At baseline, 12 patients with EO (75%) had low TT levels (<8.33 nmol/l). A significant inverse correlation between body fat percentage (%BF) and testosterone levels ($r = -0.84$, $p < 0.001$), as well as positive correlation between baseline testosterone concentrations and total cholesterol levels were evaluated ($r = 0.78$, $p < 0.01$). After the weight loss testosterone levels and metabolic parameters significantly improved ($p < 0.01$).

CONCLUSIONS

We found that increasing %BF progressively lowers testosterone levels associated with extreme obesity.. Therefore, these findings suggest that addressing obesity, lifestyle changes, and weight loss could help mitigate hormonal imbalances and low testosterone, which are linked to sexual and metabolic health risks in patients with obesity.

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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP05_07

ASSOCIATIONS OF DIETARY FAT INTAKE WITH COGNITIVE FUNCTION AND ITS DECLINE: A PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES

Evidence regarding the association between dietary fat intake and cognitive function remains inconsistent. This study aimed to examine the associations of total dietary fat and specific fatty acids with cognitive function and its decline among middle-aged and older adults.

METHODS

The current study included 6,408 participants (59.73% women; mean age 67.7 years) with cognitive function scores and without severe cognitive dysfunction from 2013 to 2020 in the Health and Retirement Study (HRS). Dietary fat intake (total, animal, vegetable) and specific fatty acids (saturated, monounsaturated, polyunsaturated, trans) were assessed using a 168-item food frequency questionnaire. The cognitive function was evaluated by the Telephone Interview for Cognitive Status-Modified (TICS-m). Linear mixed-effects models were used to estimate the beta coefficients (β) and the 95% confidence intervals (CI).

RESULTS

Higher intake of total fat (βQ5 vs. Q1: 0.401; 95% CI: 0.162 to 0.639; $P < 0.001$) and vegetable fat (βQ5 vs. Q1: 0.582; 95% CI: 0.342 to 0.822; $P < 0.001$) were associated with better cognitive function. Replacing 5% of total energy intake from animal fat with vegetable fat corresponded to better cognitive function (β: 0.176; 95% CI: 0.080 to 0.273; $P < 0.001$) and slower annual cognitive decline (β: 0.124; 95% CI: 0.001 to 0.247; $P < 0.049$). The highest intake of monounsaturated fatty acids (βQ5 vs. Q1: 0.673; 95% CI: 0.364 to 0.981; $P = 0.003$) and n-3 polyunsaturated fatty acids (βQ5 vs. Q1: 0.373; 95% CI: 0.050 to 0.696; $P = 0.031$) showed a relationship with better cognitive function. Conversely, higher intake of trans fatty acids was inversely associated with cognitive function (βQ5 vs. Q1: -0.482; 95% CI: -0.758 to -0.205; $P = 0.002$) and faster annual cognitive decline (β: -0.017; 95% CI: -0.029 to -0.005; $P = 0.003$). Isocaloric substitution of n-6 with n-3 polyunsaturated fatty acids was significantly associated with a higher cognitive function (β: 1.136; 95% CI: 0.174 to 2.099; $P = 0.021$).

CONCLUSIONS

This study demonstrates the heterogeneous associations between total fat, specific fatty acids, and cognitive function and decline, emphasizing the potential benefits of total fat, vegetable fat, and monounsaturated fatty acids while highlighting the detrimental effects of trans fatty acids. Findings also suggest that replacing animal fat with vegetable fat could serve as a strategy to improve cognitive function.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP05_08

THE PRICE OF PREVENTION: A COST ANALYSIS OF A BREAST CANCER PREVENTION DIET FOR WOMEN RESIDING IN SOWETO, SOUTH AFRICA

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BACKGROUND AND OBJECTIVES

Modifiable lifestyle factors, including diet, are crucial for cancer prevention. The high cost of a healthy diet has been reported a barrier to adhering to dietary guidelines. However, previous research indicates that moderate adherence to the South African Food Based Dietary Guidelines (SA-FBDGs) could reduce breast cancer risk in women residing in Soweto, South Africa. This study aims to conduct a cost comparison between diets with low and moderate adherence to the SA-FBDGs.

METHODS

Two sets of three-day diets were compiled to compare the costs of low and moderate adherence to the SA-FBDGs: one with an adherence score of 3.5 (low adherence) and the other with a score of 5.5 (moderate adherence). The dietary prescriptions were based on the mean characteristics (body mass index, age, and physical activity levels) and food preferences of the South African Breast Cancer study's control group. Food prices from the May 2024 South African Consumer Price Index were used to cost the diets. Diet cost was calculated as direct costs and costs relative to the Food Poverty Line and the national minimum wage.

RESULTS

A diet with low adherence to the SA-FBDGs costs an average of 31.6 ZAR (1,7 USD) per day, while a moderate adherence diet costs 38.9 ZAR (2,1 USD) per day—a difference of 7.30 ZAR (0.4 USD) or 18.8%. The cost of the low and moderate adherence diet account to 119,1% and 146.6%, of the South African Food Poverty Line, respectively. The moderate adherence diet, relative to the daily minimum wage, costs 3.3% more than the low adherence menu (14.3% vs 17.6%).

CONCLUSIONS

Despite the modest extra cost of a moderate adherence diet, healthier diets remain unaffordable for many South African women, especially women living on an income below the food poverty line. Our findings echo the overwhelming narrative that cost could be a significant barrier for women to adhere to dietary guidelines to reduce the risk e.g. breast cancer. A dual approach addressing both health and nutrition education and economic barriers is crucial to reducing breast cancer risk.

1 USD = 18,1828 ZAR

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP05_10

Dietary interventions to improve disease severity in people living with psoriasis: RESULTS from the MEditerranean and Time-Restricted Eating Diets for Psoriasis (METRED-P) feasibility trial

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BACKGROUND AND OBJECTIVES

Obesity has been identified as a cause and consequence of psoriasis incidence and severity (1). The only available dietary recommendation for people with psoriasis is a low-calorie diet for weight-loss, specific to people living with obesity (2). In view of the inflammatory nature of psoriasis, the aim of this study was to investigate the effect of anti-inflammatory diets; the Mediterranean diet (MD) and Time-Restricted Eating (TRE) on body weight and skin severity.

METHODS

The METRED-P (NCT05820698) was a randomised parallel-arm feasibility pilot study recruiting adult volunteers between June 2023-July 2024. The main inclusion criteria were a body mass index (BMI) between 20-40 kg/m2, no systemic therapies (or on systemic therapies > 6 months), a baseline Psoriasis Area Severity Index (PASI) > 5 points, and no underlying health conditions. Participants were randomised by variance minimisation to a TRE, MD, or MD with TRE. The TRE group was instructed to follow a 10:14 hour eating:fasting pattern, whilst participants on the MD were advised to consume a diet rich in olive oil, nuts, fruits, vegetables, whole grains, and oily fish. The dietary advice for the MD with TRE group was a combination of the MD and TRE guidelines. Psoriasis severity was defined by an objective PASI score. Body composition was determined using TANITA® scale. Measurements were taken from participants at baseline and after 12-weeks for repeated measures. Differences between groups were analysed with linear mixed models.

RESULTS

Twenty-two participants enrolled in the METRED-P study a majority of which were female (64%) and of white ethnicity (68%). The mean (SD) age and BMI were of 44.0 (10.0) years and 28.0 (6.3) kg/m2 Following TRE, MD, and MDTRE guidance (without energy restriction advice) for 12 weeks resulted in modest weight loss (kg) with mean differences (SD, *n*) of -3.0 (2.5, *n*=*5*), -1.6 (2.0, *n*=7), and -2.0 (1.5, *n*=5) respectively. There was a modest improvement in mean differences in PASI (SD, *n*) subject to TRE, MD, and MDTRE advice of -6.2 (4.6, *n*=5), -4.1 (3.3, *n*=7) and -1.5 (3.0, *n*=5) points respectively. There were no significant differences at endpoint between treatment groups for body weight or PASI.

CONCLUSIONS

This pilot data suggests all three interventions may have beneficial effects on psoriasis severity and lead to modest weight-loss. Further analysis of METRED-P data will determine the optimal study protocol for a fully powered diet intervention trial in people with psoriasis.

CONFLICTS OF INTERESTS

CEMG has received honoraria and/or research grants from AbbVie, Almirall, Amgen, Anaptysbio, Artax, Boehringer Ingelheim, Bristol-Myers Squibb, Celltrion, Eli Lilly, Evelo Bioscience, Galderma, GSK, Inmagene, Kyowa Kerin, Janssen, ONO Pharmaceuticals, Novartis, Pfizer, and UCB Pharma.TM has received honoraria from Abbvie, Almirall, Amgen, Galderma, Pfizer, Novartis, UCB Pharma, L'Oreal and Proctor & Gamble. WLH has received research funding from the Alliance for Potato Research & Education and the Almond Board of California, as well as consultancy fees from ZOE Ltd, and funding to attend a conference from Yakult UK Limited.

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SOAP05_11

HYPOTHESIS- AND DATA-DRIVEN DISEASE RISK SCORES IN YOUNG ADULTS – AN ANALYSIS IN THE GERMAN DONALD COHORT STUDY

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BACKGROUND AND OBJECTIVES

Disease risk scores (DRSs) are used to identify individuals at risk for non-communicable diseases. However, little is known about their potential use in young adult populations. We aimed to derive DRSs using both a hypothesis- and a data-driven approach to describe subgroups of young adults regarding their disease risk profile.

METHODS

In the open DOrtmund Nutritional and Anthropometric Longitudinally Designed (DONALD) cohort study, we calculated seven hypothesis-driven DRSs (Framingham Risk Score - Adult Treatment Panel III (FRS-ATP III, sex-specific), Prospective Cardiovascular Münster Study Score (PROCAM-2007), Life's Simple 7 (LS7), German Diabetes Risk Score (GDRS-2022), Fatty Liver Index (FLI), Hepatic Steatosis Index (HSI), Proinflammatory Score (PIS)) among 492 adult participants (20–47 years). Additionally, among 457 of these participants cluster analysis (hierarchical, k-means) was conducted with continuous metabolic risk factors (body mass index (BMI), waist circumference (WC), systolic and diastolic blood pressure, total cholesterol, high-density-lipoprotein, low-density-lipoprotein, triglycerides, fasting glucose, γ-glutamyltransferase, aspartate-aminotransferase, alanine-aminotransferase). We compared the DRSs using age- and sex-adjusted linear regressions and chi-square tests. The importance of each score component was examined using forward selection and age- and sex-adjusted logistic regressions. Longitudinal tracking of DRSs was assessed via concordance in tertile and cluster membership.

RESULTS

Cluster analysis identified two clusters (1: "comparably high-risk"; 2: "comparably low-risk"). The following RESULTS were observed in cluster 1 (41.1%) compared to cluster 2 (58.9%): Participants showed higher median values in all DRSs, a higher absolute type 2 diabetes risk (GDRS-2022), elevated liver parameters (FLI, HSI), a more unfavourable cardiovascular health (LS7), and a higher absolute CHD risk (FRS-ATP III (females)) (P<0.05). Among score components, WC and BMI were the most important risk factors. The DRSs showed considerable tracking within a median follow-up of 4.9 years.

CONCLUSIONS

Differences in DRSs may already exist in young, rather healthy adults. The disease risk profiles are especially shaped by anthropometric markers and are relatively stable over time.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP05_14

ADHERENCE TO THE 2018 WORLD CANCER RESEARCH FUND/AMERICAN INSTITUTE FOR CANCER RESEARCH CANCER PREVENTION RECOMMENDATIONS AMONG ADULTS WITH AND WITHOUT CANCER IN CHILE

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BACKGROUND AND OBJECTIVES

The World Cancer Research Fund/American Institute for Cancer Research (WCRF/AIRC) Cancer Prevention Recommendations are lifestyle-based guidelines that aim to reduce cancer risk. However, most existing research on adherence to these recommendations has been conducted predominantly in high-income countries and among non-diverse populations, leaving significant gaps in understanding among cancer survivors and diverse ethnic groups. This study aims to assess adherence to the WCRF/AICR Recommendations among cancer survivors and the general population in Chile.

METHODS

A cross-sectional study was conducted with 230 participants, including 80 cancer survivors and 150 adults without a history of cancer, matched by sex and age, from a south-central region of Chile. A survey was administered to evaluate adherence to the WCRF/AICR Cancer Prevention Recommendations. Total adherence scores, ranging from 0 to 7 points, were calculated based on dietary, physical activity, and anthropometric data. Associations were analysed using chi-square tests or ANOVA, stratified by population sociodemographic characteristics. Approved by Herminda Martin Clinical Hospital's ethics committee.

RESULTS

The mean adherence score in the cancer survivor population was 4.4 ± 0.86 points, compared with 4.5 ± 0.99 points in the general population. The Recommendations with the lowest adherence were fruit and vegetable intake (17.5%), sugary drink consumption (5%), and dietary fibre intake (3.7%). Conversely, the Recommendations with the highest adherence were fast food intake (91.3%), physical activity (85.5%), and red and processed meat intake (78.8%). Significant differences were observed by SES and education level, with lower SES individuals scoring 4.5 ± 1.1 and higher SES individuals scoring 4.6 ± 0.91 (p=0.001), while those with lower education scored 4.2 ± 1.1 compared with 4.7 ± 0.96 for higher education (p=0.001). In the general population group, the recommendations with the lowest adherence were physical activity (35.3%), maintaining a healthy weight (16.7%), and fibre intake (1.3%). The recommendations with the highest adherence were fast food intake (84.7%) and alcohol consumption (90.7%).

CONCLUSIONS

This study reveals moderate adherence to the WCRF/AICR Recommendations among adults with and without cancer in Chile, with low adherence to fibre, fruits, and vegetables in both groups. These findings underscore the need for targeted interventions to improve dietary and lifestyle behaviours to support cancer prevention and survivorship in diverse settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP05_15

PROSPECTIVE ASSOCIATIONS OF SUGAR-SWEETENED BEVERAGES, FRUIT JUICES AND ARTIFICIALLY SWEETENED BEVERAGES CONSUMPTION WITH PREDIABETES RISK IN THE ROTTERDAM STUDY

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BACKGROUND AND OBJECTIVES

Higher consumption of sugar-sweetened beverages (SSBs) has been linked to increased risk of pre(diabetes), but the associations of potential alternative beverages such as fruit juices and artificially-sweetened beverages (ASBs) with prediabetes risk remain controversial. We aimed to estimate the associations between SSBs, fruit juices, and ASBs consumption with prediabetes risk, and to estimate the effects of the modelled replacement of SSBs with fruit juices, ASBs, coffee, tea, or milk on prediabetes risk.

METHODS

We examined 6,355 middle-aged and senior Dutch adults [mean age 61.8(SD 7.7) years, 61% women, 16% obese] of the prospective population-based Rotterdam Study cohort, without diabetes at baseline (1990-2006). Consumption of beverages, except for water, was assessed using validated food-frequency questionnaires. Participants were followed from baseline through 2015 for the occurrence of prediabetes, ascertained through information from medical records, hospital discharge letters, and blood-glucose measurements. We used multivariable Cox proportional hazards regression models, adjusted for sociodemographic, lifestyle, and dietary factors, to estimate hazard ratios (95% CIs) for prediabetes risk across tertiles of beverage intake among consumers (T1-T3), with non-consumers serving as the reference. Replacements between beverages were modelled using the leave one out model.

RESULTS

Among consumers of SSBs (37%), fruit juices (62%), and ASBs (13%), median (IQR) intake levels were 42 (15-109), 68 (23-140), and 64 (25-175) mL/day, respectively. During 10 years of follow-up, 1,077 participants developed prediabetes. No significant associations were observed between SSBs or ASBs and prediabetes risk. Fruit juice intake was associated with lower prediabetes risk only at intakes >139 mL/d (HRT3vs.non-consumers: 0.80, 95%CI: 0.67-0.97). The modelled replacement of a 150 mL/day serving of SSBs with an equivalent additional serving of tea or ASBs was associated with lower prediabetes risk.

CONCLUSIONS

In this population of middle-aged and older Dutch individuals with low SSBs and ASBs consumption, these beverages were not linked to prediabetes risk. Fruit juice intake showed inconsistent associations with prediabetes risk, warranting further research. Lastly, tea may be a suitable alternative to SSBs for reducing prediabetes risk.

CONFLICTS OF INTERESTS

Carolina Ochoa-Rosales no CoIJulianne van Oortmerssen no CoIMaria Gorety Jacobo Cejudo no CoIMarianne Geleijnse works for the Dutch Ministry of Health, Welfare and Sports and EU Horizon 2020Marianne's Geleijnse

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SOAP 08 - NON COMMUNICABLE DISEASES

SOAP08_01

DRIED FRUIT INCREASES STOOL WEIGHT AND STOOL FREQUENCY IN CHRONIC CONSTIPATION: A RANDOMISED, PLACEBO-CONTROLLED, FOOD INTERVENTION TRIAL

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BACKGROUND AND OBJECTIVES

Chronic constipation is a common gastrointestinal (GI) disorder that impacts quality of life yet has high treatment dissatisfaction (1,2). Fruits are often recommended to manage constipation, despite few clinical trials of their effectiveness. Proposed mechanisms are that fruits contain fibre that may reduce gut transit time and increase stool weight, while some fruits contain sorbitol that has osmotic effects in the gut (3). There remains limited evidence on the contribution of fibre or sorbitol, alone or in combination, on constipation. We investigated the impact of dried fruit (fibre and sorbitol), fruit juice (sorbitol but no fibre) and a fruit-flavoured placebo (no fibre or sorbitol) on symptoms of constipation.

METHODS

Participants meeting Rome IV criteria for functional constipation were randomised to 4 weeks of: (1) 90 g/d dried fruit (30g each of prunes, raisins, apricots); (2) fruit juices from the same fruits (plums, grapes, apricots; volumes matched to dried fruits for sorbitol and energy); or (3) fruit cordial placebo (water/sugar with fruit flavourings; volumes matched for energy to other arms). The primary outcome was change in stool weight measured from 7-day total stool collection. Clinical outcomes included stool consistency and frequency, GI symptoms, constipation symptoms (PAC-SYM, CCCS) and quality of life (PAC-QOL).

RESULTS

150 people with constipation were recruited (88% female; mean age 33.9 y, SD 12.7). Change in stool weight was significantly different between groups (p=0.047): dried fruit (mean +21.2 g/d, SD 38.7), fruit juice (+13.2 g/d, SD 40.2) and placebo (+1.6 g/d, SD 25.8;), with significantly greater increases following dried fruit than placebo (p=0.042). There were significantly greater increases in complete bowel movements (p=0.039) and complete spontaneous bowel movements for dried fruit (p=0.025), and spontaneous bowel movements for fruit juice (p=0.026), versus placebo. There were no differences in clinical scores between groups, although change in PAC-QOL satisfaction subscale score (a lower score indicating improved quality of life) was significantly lower for dried fruit (mean -5.8, SD 5.2) versus placebo (-2.8, 6.2; p=0.029). Dried fruits did not induce significant GI side effects, while change in severity of borborygmi was greater for juice (mean +0.1, SD 0.6) than dried fruit (-0.2, 0.5; p = 0.032).

CONCLUSIONS

This is the largest clinical trial testing the impact of fruit in chronic constipation, indicating dried fruits containing both fibre and sorbitol were most effective. Analysis of gut microbiome (16S sequencing) and gut transit time (SmartPill™) data is underway.

CONFLICTS OF INTERESTS

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SOAP08_02

FRONT-OF-PACK FOOD LABELING (FOPL) AS A STRATEGY TO ADDRESS NON-COMMUNICABLE DISEASES IN NIGERIA: CHALLENGES AND OPPORTUNITIES

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BACKGROUND AND OBJECTIVES

The Double Burden of Malnutrition (DBM) in Nigeria, characterized by the coexistence of undernutrition and overnutrition, along with diet-related non-communicable diseases (NCDs), poses a significant Public Health issue. Globally, it is associated with high morbidity and mortality rates.This study aims to identify policy gaps and recommend improvements to better address the DBM in Nigeria. This will facilitate the national efforts in achieving both the national and global nutrition targets.

METHODS

A qualitative research design was utilized, combining a comparative policy analysis with stakeholder interviews. The policy analysis compared Nigeria's food and nutrition policies with international guidelines from organizations such as UN, FAO, WHO, EAT forum, Global Alliance for Improved Nutrition (GAIN), World Food Program (WFP), World Bank (WB), UNICEF, International Food Policy Research Institute (IFPRI) and the Global Panel on Agriculture and food systems for Nutrition. Semi-structured interviews were conducted with stakeholders from government, academia, private sectors, and NGOs to gain deeper insights into policy gaps and implementation challenges.

RESULTS

The comparative analysis revealed significant gaps in the National Policy on Food and Nutrition in Nigeria (NPNF), particularly in strategies addressing overnutrition and diet-related NCDs. Key strategies like front-of-pack labeling (FOPL), reformulation policies, and private sector engagement were missing. FOPL, a strategy enabling consumers to make well-informed nutrition decisions through interpretive labels on food products, was identified as a critical component lacking in the current policy. Stakeholder interviews emphasized the need for capacity building, including enhanced funding, regulatory frameworks, and public awareness campaigns. Challenges highlighted include complex consumer behavior, regional disparities, and inadequate enforcement mechanisms within the food regulator agencies

CONCLUSIONS

An integrated approach addressing undernutrition, overnutrition, and diet-related NCDs is crucial for combating the DBM in Nigeria. Implementing FOPL can empower consumers to make healthier food choices through clear and accessible information on the nutritional quality of food products. Successful implementation requires robust regulatory frameworks, comprehensive public awareness campaigns, and targeted consumer behavior research. Strengthening food regulatory agencies capacity and ensuring sustainable funding are essential for effective enforcement and monitoring.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP08_03

PATIENTS WITH PHENYLKETONURIA SHOW IMPAIRMENT IN THEIR EXECUTIVE FUNCTIONS FOLLOWING INADEQUATE METABOLIC CONTROL, BUT INDEPENDENT OF THEIR HABITUAL DIET

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BACKGROUND AND OBJECTIVES

Phenylketonuria (PKU; OMIM #261600) is a metabolic disorder characterized by phenylalanine (Phe) accumulation that leads to severe neurological impairments and cognitive deficits if left untreated. European guidelines recommend a strict dietary adherence for treatment until the age of 12 (blood Phe < 360 µmol/L), after which the therapy can be loosened (120-600 µmol/L) but should be followed for life. Until 2017, however, a limit of 1200 µmol/L was recommended. The aim of this study was to investigate whether the cognitive performance of adult, early diagnosed and treated PKU patients is impaired compared to healthy age-matched individuals.

METHODS

A computer-based cognition testing of 18 patients with PKU (11 f; 35 ± 12 years) and 19 controls (10 f; 36 ± 11 years) was performed. The parameters working memory (2-back task), inhibitory control (flanker task), visual-spatial memory (corsi-block-tapping task), information processing (switching costs, switch task), attention (M3 task), and memory (word recall) were tested. Dietary habits were rated using the World Index for Sustainability & Health (WISH; scale: 0 - 130 points), and body mass index (BMI) was recorded. Phe concentrations of the last year were available from 13 PKU patients. Normally distributed data (mean ± standard deviation) were analyzed by t-test, non-normally distributed (median [P25;P75]) by Mann-Whitney U-test.

RESULTS

PKU patients (BMI: 25.0 ± 5.5; WISH: 60.6 ± 16.4; Phe: 732 ± 370 µmol/L) performed worse in individual cognitive tasks than controls (BMI 24.5 ± 4.0; WISH: 59.4 ± 18.3). The switching costs were lower in controls (12.0 ± 5.6 s) than in patients with PKU (18.9 ± 8.0 s; $p = 0.01$). Patients with PKU recalled fewer words in the word recall task (8.0 [6.0;9.3]) than controls (10.0 [8.0;10.0], $p = 0.03$). In the flanker task, PKU patients made more errors in incongruent sequences (PKU: 8.6 [2.9;17.9] vs. Co: 2.9 [0.0;5.7]; $p = 0.02$), and processed congruent sequences slower (300 ms [281;339] vs. 270 ms [267;305]; $p = 0.02$). The latter also correlated positively with the mean Phe concentration of the previous year ($r = 0.69$; $p = 0.01$). There was no correlation with the WISH score.

CONCLUSIONS

PKU patients show deficits in individual cognitive parameters. The diet measured by the WISH score does not appear to be associated with the patients' cognitive performance cognition. These finding suggests that patients with PKU could benefit from Phe concentrations of 120-600 µmol/L, as recommended by European guidelines.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP08_04

Does inflammation explain the link between vitamin D and depression? RESULTS of a cross-sectional and secondary analysis of an interventional study in children and adolescents

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BACKGROUND AND OBJECTIVES

Studies suggest an inverse relationship between vitamin D and depression, potentially mediated by anti-inflammatory effects. However, data linking these three aspects is limited, particularly in adolescence. Therefore, we examined the interrelationship among vitamin D, inflammation and depression in children and adolescents.

METHODS

We used data from (1) a cross-sectional study [n=465] and (2) a RCT [n=92], both conducted at a psychiatric hospital. In both studies, depression severity was evaluated using Beck Depression Inventory II (BDI-II), and Diagnostic System for Mental Disorders in Childhood and Adolescence via self-assessment (DISYPS Self) and parent reports (DISYPS Proxy). In study 1, serum 25(OH)D and CRP were measured in all participants. In a subsample [n=177], we additionally measured TNF-α, IFN-γ, IL-1β, IL-6, IL-8, IL-10. In study 2, participants with vitamin D deficiency (25(OH)D ≤ 30 nmol/L) and at least mild depression (BDI-II > 13) from the cross-sectional cohort were randomly assigned to the intervention (2640 IU vitamin D3/day for 28 days) or the placebo group, both alongside treatment as usual (Libuda et al. 2020). In this secondary analysis, we examined whether intervention effects depended on baseline inflammation status measured by CRP.

RESULTS

73.5%–83.2% of participants had at least mild depression, and 43.2% were at risk of vitamin D deficiency. Linear regression showed an inverse association between vitamin D levels and BDI-II scores. Logistic regression confirmed an inverse association between vitamin D and depression in DISYPS Proxy, but not DISYPS Self. Although 25(OH)D weakly correlated with inflammation markers e.g. CRP (r= -0.21, p< 0.0001), their inclusion in the regression models did not change the association with depression. Study 2: CRP levels were in the normal range (<5 mg/L) in 91.3% of the participants. No significant interaction between intervention and CRP status on depression severity was found for any of the depression assessment tools. Stratified analyses by CRP status showed no inflammation-dependent effects of vitamin D supplementation on depression.

CONCLUSIONS

Our RESULTS suggest a modest inverse relationship between vitamin D and depression in children and adolescents. Although vitamin D was linked to certain inflammatory markers, anti-inflammatory effects did not

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mediate the cross-sectional association, nor were supplementation effects influenced by CRP status. The RESULTS need cautious interpretation since CRP levels in our sample were predominantly in the normal range.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

L. Libuda et al., “Effect of vitamin D deficiency on depressive symptoms in child and adolescent psychiatric patients: RESULTS of a randomized controlled trial,” European journal of nutrition, vol. 59, no. 8, pp. 3415–3424, 2020, doi: 10.1007/s00394-020-02176-6.

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SOAP08_05

ADHERENCE TO THE EAT-LANCET PLANETARY HEALTH DIET, MORTALITY OUTCOMES AND ENVIRONMENTAL IMPACTS AMONG MYOCARDIAL INFARCTION PATIENTS

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BACKGROUND AND OBJECTIVES

The potential impact of the EAT-Lancet Planetary Health Diet (PHD) on mortality risk in patients with cardiovascular disease (CVD) is unknown. We aimed to develop a PHD Index (PHDI) for Dutch CVD patients and to evaluate its associations with all-cause and CVD mortality, and with dietary environmental impacts.

METHODS

Post-myocardial infarction patients enrolled in the Alpha Omega Cohort (2002-2006, age 60-80 years, 80% male) were followed for cause-specific mortality through December 31, 2022. For patients who completed a food frequency questionnaire (FFQ) at baseline (n=4,365), we calculated a PHDI as the sum of 13 food group-specific PHD subscores (0-10 each, maximum adherence: 130). Beverages, except for milk, were not part of the PHDI. Life cycle assessment data, including greenhouse gas emissions (GHGE), fossil energy use (FEU) and land use (LU), were linked to FFQ items. We used Cox proportional hazards models to assess the associations of the PHDI with all-cause and CVD mortality. Hazard ratios with 95% confidence intervals (95% CI) were adjusted for demographic, lifestyle and health confounders. Linear regression was used to model associations of the PHDI with dietary environmental impacts, adjusting for age, sex and energy intake.

RESULTS

The median (interquartile range) of the PHDI was 47 (40-54), indicating a relatively low adherence. PHD subscores varied substantially for dairy and potatoes, but not for red meat due to its high overall consumption, resulting in a minimal contribution of red meat to the PHDI. During 56,152 person-years of follow-up, 2,869 patients died, including 1,112 from CVD. Those with greater adherence to the PHDI had a 16% (95% CI 6-25%, Q4 versus Q1) lower risk of all-cause mortality (p for trend: 0.004) and a 24% (9-36%) lower risk of CVD mortality (p for trend: 0.005). The PHDI was positively associated with environmental impact indicators (Q4 versus Q1: +5.5% for GHGE, +10.0% for FEU and +8.2% for LU, all p for trend <0.001).

CONCLUSIONS

Greater adherence to the PHDI was associated with lower risks of all-cause and CVD mortality in CVD patients. However, the PHDI did not adequately capture interindividual variations in food intake in this population with a traditional Dutch diet, which contributed to positive associations between the PHDI and dietary environmental impacts. Nevertheless, these findings provide support for a transition towards diets aligned with EAT-Lancet PHD recommendations to improve the long-term health of CVD patients.

CONFLICTS OF INTERESTS
Esther Cruijsen: No COIJohanna M Geleijnse: Dutch Ministry of Health, Welfare and Sports, and EU Horizon 2020Manuela Rossi: No COIMarinka Steur: No COIJohanna M Geleijnse: Works at the Dutch Ministry of Health, Welfare and Sports; funding from EU Horizon 2020

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SOAP08_06

BETTER DIETARY QUALITY IS LINKED TO LOWER PRE- AND POSTNATAL DEPRESSIVE AND ANXIETY SYMPTOMS IN WOMEN WITH OVERWEIGHT AND OBESITY

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BACKGROUND AND OBJECTIVES

Depressive and anxiety symptoms have been associated with various adverse pregnancy outcomes and may negatively affect the health and development of the child. Mental health problems during pregnancy are also linked to an increased risk of postnatal depression and anxiety. Thus, it is important to find strategies for preventing or reducing these symptoms during pregnancy and postpartum. Previous research has shown a link between diet and mental health symptoms, primarily in women with normal weight. Thus, this study aims to investigate the link between diet quality and perinatal depressive and anxiety symptoms among pregnant women with overweight and obesity. Women with overweight and obesity are at increased risk for mental health challenges during and after pregnancy, making it important to investigate how diet may influence both depressive and anxiety symptoms in this risk group.

METHODS

In total, 439 women with overweight and obesity were recruited for the mother-child dietary intervention trial in early pregnancy. Dietary quality with respect to that recommended was assessed using the validated Index of Diet Quality (IDQ). The IDQ questionnaire consists of 18 multiple-choice questions about the frequency and quality of foods including whole grains, vegetable oil spreads, dairy, vegetables, fruits, and sugar-rich foods. The total IDQ score ranges from 0 to 15 points. Depressive symptoms were assessed with the Edinburgh Postnatal Depression Scale (EPDS) and anxiety symptoms with the Symptoms Checklist (SCL-90) in early and late pregnancy, as well as three, six and 12 months postpartum. The associations between the mother's diet and depressive and anxiety symptoms were tested with Spearman correlations.

RESULTS

Both mean EPDS ($r=-0.12$, $p=0.01$) and SCL-90 ($r=-0.13$, $p=0.01$) scores were negatively correlated with IDQ in early pregnancy. Mean EPDS scores were also negatively correlated with IDQ ($r=-0.13$, $p=0.03$) at six months postpartum. No differences were observed in the other measurement points.

CONCLUSIONS

RESULTS suggest that overall better dietary quality is linked to lower depression and anxiety symptoms in early pregnancy and at six months postpartum in women with overweight and obesity. These findings should be considered in maternal healthcare to integrate mental health and nutrition support, especially for this population at higher risk of perinatal mental health problems. However, further research on this topic is still needed.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP08_08

CHANGES IN THE CRITICAL NUTRIENT CONTENT OF PACKAGED FOODS AND BEVERAGES AFTER THE INITIAL IMPLEMENTATION OF THE PERUVIAN FRONT-OF-PACKAGE WARNING LABEL POLICY: A NONEXPERIMENTAL PROSPECTIVE STUDY

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BACKGROUND AND OBJECTIVES

In June 2019, the first phase of the Peruvian Food Labelling Law mandating front-of-package warning labels (FOPWL) for unhealthy packaged foods and beverages was implemented. This study assesses nutrient content changes in packaged products to evaluate reformulation after the policy's initial implementation.

METHODS

Nutritional facts panel data was collected in a representative sample of packaged foods and beverages available in Peruvian markets at two time periods: pre-implementation (T0: March-April 2019; n = 2,481) and post-implementation (T1: March 2020–February 2021; n = 3,018). Quartiles of nutrients of concern (i.e., total sugars, saturated fats, sodium, and trans fats per 100 g/100 mL) and the proportion of food and beverage products meeting criteria for FOPWL (i.e., products "high-in" or "contains trans fats") were compared pre- and post-implementation of the law in cross-sectional samples. A longitudinal subsample (i.e., the same product collected at both T0 and T1; n = 1,694) was also analyzed. Marginal means from logistic regression and quantile regressions were used for comparisons.

RESULTS

Cross-sectional analysis showed a significant decrease (T0 versus T1) in the proportion of products containing any FOPWL for both foods (66.5% to 59.4%; p<0.01) and beverages (27.4% to 18.5%; p <0.01). The proportion of food and beverages meeting criteria for "high-in" sugar FOPWL significantly decreased over time in breakfast cereals, sweet bakery, sweet spreads, and sweetened beverages (from 51.4% to 40.7%; p<0.01). The proportion of products "high-in" saturated fats significantly decreased in ready-to-eat meals and sweet bakery products from 57.4% to 42.6% (p<0.01). The only food group with a notable reduction in the proportion of "high-in" sodium was savory spreads (42.9% vs 31.0%; p=0.02), while the proportion of "contains trans fats" only significantly decreased in sweet bakery (19.5% vs 10.2%; p < 0.01). Longitudinal analyses showed similar RESULTS, with additional reductions in the proportion of ice creams and milk-based products with "high-in" sugar FOPWL.

CONCLUSIONS

After implementing Peru's Food Labelling Law, sugars and saturated fats significantly decreased in several packaged food and beverage products. These findings highlight FOPWL policies' potential to drive manufacturer reformulation in the food supply, thus reducing dietary risk factors for non-communicable diseases (NCD). Further research should evaluate the long-term impact of these changes on dietary quality and NCD prevention.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP08_09

RELATIONSHIP BETWEEN DIETARY PATTERNS, FOOD MOLECULAR COMPOSITION, AND TYPE 2 DIABETES RISK IN A COLOMBIAN AFRO-DESCENDANT COMMUNITY

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BACKGROUND AND OBJECTIVES

Type 2 diabetes (T2D) disproportionately affects vulnerable communities, particularly afro-descendant populations in Colombia. This study investigates the relationship between dietary patterns, molecular composition of foods, social determinants of health, and risk of T2D to establish nutritional intervention paths.

METHODS

A interdisciplinary cross-sectional study was conducted in a cohort of 326 normoglycemic adults from Padilla, Cauca, Colombia. Dietary patterns were assessed using a food frequency questionnaire, while T2D risk was estimated with an adapted FINDRISC (Finnish Diabetes Risk Score) scale. Social determinants of health were evaluated through a questionnaire tailored to identify factors, such as socioeconomic status, that may influence dietary choices and the risk of T2D. Identified dietary patterns were classified using factor analysis, and a subsample of participants with high and low diabetes risk was selected for detailed food analysis (group diet) using liquid chromatography-mass spectrometry (HPLC-MS) under standardized protocols established by the Periodic Table of Food Initiative (PTFI) at the Center of Excellence (iÓMICAS).

RESULTS

Data from 326 afro-descendant individuals revealed that over 50% had some level of T2D risk according to the FINDRISC scale. Two primary dietary patterns were identified within the community, and their potential links to diabetes risk are under exploration. Social determinants data provided insights into the socioeconomic status of the population, highlighting its influence on dietary choices. The interplay between social determinants, dietary patterns, and diabetes risk is being investigated further. We are currently using the metabolomics food profile to correlate with biomarkers associated with T2D risk, which is expected to enable personalized nutrition and preventive strategies.

CONCLUSIONS

Our findings reveal a high prevalence of T2D risk in this afro-descendant population, shaped by both dietary and socioeconomic factors. The study highlights the importance of integrating social determinants into dietary research to fully understand their impact on health outcomes. While the association between dietary patterns and diabetes risk is still exploratory, the RESULTS provide a solid foundation for future hypotheses and targeted interventions. We will present on the molecular composition of foods that correlate highly with social determinants to influence the metabolic health outcome in this community, in order to inform community-level strategies to reduce T2D risk.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP08_10

HIGH PREVALENCE OF VITAMIN B12 DEFICIENCY IN SUBJECTS WITH ATROPHIC GASTRITIS

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BACKGROUND AND OBJECTIVES

Vitamin B12 (VB12) has unique features; complex absorption process and large hepatic storage. VB12 is first liberated from food by gastric acid, then binds to intrinsic factor (IF) secreted from gastric parietal cell, and VB12-IF complex is absorbed from terminal ileum. Thus, VB12 deficiency is an inevitable consequence of gastrectomy. Conventional theory holds that VB12 deficiency occurs years after gastrectomy because of the large hepatic storage. However, gastrectomy is mostly indicated for patients with gastric cancer, most of which develops after long-standing atrophic gastritis (AG). Then, we have made a hypothesis that VB12 absorption is already impaired years before surgery, and VB12 deficiency occurs much earlier than previously considered, and performed two studies.

METHODS

(Study 1) VB12 status was evaluated in patients before and after gastrectomy. Severe VB12 deficiency and deficiency were defined as serum VB12<150pmol/L and 150-258 pmol/L, respectively. Plasma homocysteine (Hcy) concentration was also measured reflecting folate, VB12, or vitamin B6 status. (Study 2) Healthy subjects visiting the hospital for health checkup were evaluated for their blood VB12, folate, Hcy, and ferritin levels. AG grade was based on endoscopical classification and blood pepsinogen-1 and -2 levels were measured.

RESULTS

(Study 1) Severe VB12 deficiency and deficiency were present in 19.0% and 52.4%, respectively in patients within three years after surgery. They were already present even before gastrectomy. Plasma Hcy concentration was inversely associated with serum VB12 concentration. VB12- and iron-deficiency anemia co-existed. (Study 2) The prevalence of VB12 severe deficiency/deficiency was 26.5%. According to the AG classification, serum albumin, ferritin and pepsinogen-1 concentrations were significantly lower in subjects with advanced stage than those with less-advanced stage. In the pepsinogen-based high-risk group, serum VB12 and ferritin concentrations were significantly lower.

CONCLUSIONS

VB12 deficiency is prevaent in patients early after and before gastrectomy, also in those with AG. AG, quite common in the elderly, is mostly asymptomatic and often left undiagnosed, and VB12 deficiency is likely to be unrecognized. Mean corpuscular volume (MCV), commonly used parameter in the differential diagnosis of anemia, is increased in VB12 deficiency and decreased in iron deficiency. Since gastrectomy and AG impair the absorption of both nutrients, MCV within the reference range does not exclude VB12 deficiency, and evaluating VB12 status by its serum level is recommended in those with gastrectomy or AG.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP08_11

EFFECTS OF AN ANTI-INFLAMMATORY DIET ON INFLAMMATION AND OXIDATIVE STRESS PARAMETERS IN PATIENTS WITH KNEE OSTEOARTHRITIS

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BACKGROUND AND OBJECTIVES

Osteoarthritis (OA) has long been considered as a degenerative disease of cartilage tissue resulting from bodily wear and tear. However, there is accumulating evidence that inflammation plays a key role in the pathogenesis of OA. While exercise therapy is an effective component of early treatment, nutritional therapy has played a subordinate role up to now and is mainly limited to reducing existing overweight. In the course of the NUMOQUA project (Nutrition and movement to improve quality of life with knee osteoarthritis), a new anti-inflammatory therapeutic diet named “Austrian Osteoarthritis Cuisine” was developed. It is based on the framework of the New Nordic Diet combined with the food-based dietary guidelines of Austria, the guidelines for OA, the Austrian food culture, and the principles of a sustainable diet. The present study examines the effects of the “Austrian OA Cuisine” combined with the evidence-based training program GLA:D® (Good Life with osteoArthritis in Denmark) on blood inflammatory and oxidative stress parameters in patients with knee OA in Austria.

METHODS

A total of 63 participants aged 50 to 75 with knee OA were included and randomly assigned either to the intervention group or the control group. All participants took part in the GLA:D® program in the first six weeks. Additionally, the intervention group received nutritional group training and individual nutritional counselling on the “Austrian OA Cuisine” over nine months. The control group received general information about a healthy lifestyle. Measurements of inflammatory and oxidative stress parameters were performed at baseline and at three follow-up dates within one year.

RESULTS

The recruitment of patients was finished in January 2024 and data collection will be completed by January 2025. The RESULTS will provide insight into whether the intervention has effects on various blood-based biomarkers (e.g., interleukin-18, tumor necrosis factor alpha, matrix metalloproteinase-3, ferric reducing ability potential, oxidized LDL cholesterol).

CONCLUSIONS

The prevalence of OA is expected to increase in future due to ongoing demographic changes and rising obesity rates. The study will provide important evidence about the influence of this interdisciplinary approach on the chronic low-grade inflammation in patients with knee OA and whether this could be a sustainable strategy in the future to address the disease process of OA without negative side effects.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP08_12

CHALLENGES AND OPPORTUNITIES FOR COMMUNITIES AND FOOD INDUSTRIES TO IMPLEMENT THE SODIUM BENCHMARKS FOR PRE-PACKAGE FOOD

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BACKGROUND AND OBJECTIVES

Excess salt consumption is a major public health problem, contributing to the global hypertension and cardiovascular burden. The nation has recently released new guidelines setting the lowest maximum sodium content in prepackaged foods, aiming to mitigate sodium-related health risks and align with international recommendations. This abstract aims to present an overview of the new guidelines on the lowest maximum sodium content in prepackaged food and assess their public health implications and potential impacts on the food industry in this nation.

METHODS

Adapting WHO global sodium benchmarks for 18 food categories, the country developed the benchmarks for 11 food groups relevant to the local food supply. A review of the eating behaviors, food consumption, prepackaged food consumption, and food sale data was conducted to compare sodium limits across various food categories with the local and global benchmarks. Stakeholder interviews and secondary data analysis were employed to evaluate potential challenges and opportunities for implementation.

RESULTS

The guidelines introduced sodium benchmarks for 11 common prepackaged food groups in the nation, based on the WHO thresholds. The benchmarks had been introduced to all provinces to ensure adoption at all local levels. However, the mechanism and resources for the implementation of the benchmarks are limited. The benchmarks represent a 20–30% reduction in sodium thresholds, positioning the country among the countries active in sodium reduction efforts. While public health experts lauded the initiative for its potential to increase healthy food options and reduce cardiovascular disease burden, concerns from food industries were about reformulation costs, product acceptability, and compliance timelines. Acceptability of the guideline may be strengthened with the adoption of interim, stepwise targets for food categories that greatly exceed the benchmarks, based on locally collected data.

CONCLUSIONS

The nation’s new sodium guidelines mark a critical step towards improving population health through dietary sodium reduction. Successful implementation will require multisectoral collaboration, consumer education, and technological innovation in food production.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP08_13

A SURVEY ON NUTRITION LABELLING OF FOOD PRODUCTS ACROSS EIGHT COUNTRIES IN THE WHO EUROPEAN REGION

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BACKGROUND AND OBJECTIVES

Food labelling, especially front-of-pack nutrition labelling (FOPNL), can encourage consumers to make healthier dietary choices and incentivise food reformulation (1,2). In November 2022, in a multi-country capacity building workshop held in Armenia, countries highlighted the need to understand food labelling policies in their countries better. This survey reports the estimates of the prevalence of FOPNL and other food labelling elements in: Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan and Russia.

METHODS

First, the survey was piloted in two countries (Portugal and United Kingdom). Then, in each country under study, researchers visited one large and one small neighbourhood store and randomly selected and photographed the package of approximately 330 products. Products were classified as "healthy" or "unhealthy" according to the WHO Regional Office for Europe nutrient profile model (second edition) (3).

RESULTS

Our preliminary analysis estimates the prevalence of elements covered by the ingredient list, the nutrient declaration, and the presence and type of FOPNL, per country (Table 1). The next stage of analysis will compare the prevalence of these elements between “healthy” and “unhealthy” products.

Table 1. Preliminary estimates of prevalence of different labelling elements (% (n))

Countries	Number of products	List of ingredients	Nutrient declaration	FOPNL
Georgia	330	94.5 (312)	99.7 (329)	3 (10)
Belarus	310	87.7 (272)	89.7 (278)	5.2 (16)
Kyrgyzstan	346	98.8 (342)	98 (339)	9.5 (33)
Armenia	330	89.7 (296)	95.2 (314)	3.3 (11)
Russia	282	99.3 (280)	98.9 (279)	8.5 (24)
Kazakhstan	330	96.1 (317)	91.8 (303)	9.1 (30)

CONCLUSIONS

This survey is the first to analyse the prevalence of labelling elements in these countries, providing an essential basis to support improvements in food labelling policy. Early findings suggest that there are significant variations and a limited prevalence of FOPNL, likely due to a lack of harmonized regulations and current voluntary guidelines instead of mandatory legislation in place. NB: Data extraction and analysis is ongoing and more RESULTS will be presented at the 23rd IUNS-ICN.

CONFLICTS OF INTERESTS

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SOAP08_14

COMMUNITY-BASED DIGITAL HEALTH INTERVENTIONS FOR THE PRIMARY PREVENTION OF CARDIOVASCULAR DISEASE IN DEVELOPING ECONOMIES: AN UPDATE OF RECENT EVIDENCE

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BACKGROUND AND OBJECTIVES

Cardiovascular diseases (CVDs) remain the leading cause of global mortality and disability, with developing countries accounting for 75% of CVD-related deaths and 80% of the disease burden. Digital health interventions (DHIs) present a promising approach to address key risk factors for the primary prevention of CVDs in developing economies, necessitating an evaluation of their efficacy. We aim to explore the effectiveness of DHIs in the primary prevention of CVDs in these settings.

METHODS

We systematically searched recent randomized controlled trials (RCTs) using PRISMA guidelines across five databases (Ovid Medline, Scopus, PubMed, Embase, and Cochrane Central Register of Controlled Trials). The trials reported on DHIs targeting health-related behaviour and/or outcomes associated with CVD, including its risk factors. Study inclusion and exclusion criteria were defined using the PICOTS framework.

RESULTS

The trials employed diverse DHIs aimed at behaviour change interventions, primarily assessing outcomes such as anthropometry, blood pressure, glucose control, blood lipids, metabolic syndrome, and cumulative CVD risk. Significant improvements in body mass index, weight, waist circumference, blood pressure, and triglyceride levels were observed, demonstrating DHIs' potential.

CONCLUSIONS

While DHIs show modest efficacy in primary CVD prevention, identified research gaps highlight the need for studies addressing practical implementation challenges. Advancing DHI strategies could enable their adoption as a primary intervention for CVD prevention in the near future.

CONFLICTS OF INTERESTS

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SOAP08_15

Food Additive Preservatives and Antioxidants and Risk of Type 2 Diabetes – RESULTS From a Large Prospective Cohort

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BACKGROUND AND OBJECTIVES

Experimental studies suggested potential metabolic effects of preservative and/or antioxidant food additives on pancreatic tissue, insulin disruption, and inflammation, but epidemiological data is lacking. This study aimed to investigate for the first time the associations between exposures to a wide range of preservatives and antioxidants and type 2 diabetes (T2D) risk in a large population-based cohort.

METHODS

Participants (n=108,723, 79.2% women, mean age=42.5y, SD=14.6) from the French NutriNet-Santé prospective cohort (2009-2023) completed repeated 24h-dietary records including specific brands of industrial products. Preservative and antioxidant exposure was assessed using composition databases and laboratory assays. We characterised associations between time-dependent exposures to preservatives and antioxidants and risk of T2D using multivariable Cox models adjusted for known confounders.

RESULTS

1131 T2D cases were identified during follow-up. Higher intakes of the following additives were associated with a higher risk of developing T2D: potassium sorbate (HR higher vs non/low-consumers = 2.15, 95%CI [1.76-2.63]), potassium metabisulphite (1.29 [1.10-1.51]), acetic acid (1.31 [1.08-1.60]), sodium acetates (1.23 [1.01-1.50]), calcium propionate (1.44 [1.22-1.70]), sodium ascorbate (1.41 [1.19-1.66]), alpha-tocopherol (1.30 [1.05-1.60]), sodium erythorbate (1.43 [1.20-1.69]), phosphoric acid (1.39 [1.10-1.75]), extracts of rosemary (1.20 [1.02-1.41]), sodium nitrite (1.50 [1.26-1.78]) and citric acid (1.29 [1.11-1.51]).

CONCLUSIONS

This large prospective cohort revealed associations between exposures to food additive preservatives and antioxidants widely used in industrial foods and increased T2D risk . If confirmed, these findings could lead to a re-evaluation of regulations governing the use of these additives by the food industry, to improve consumer protection.

CONFLICTS OF INTERESTS

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SOAP 14 - NON COMMUNICABLE DISEASES

SOAP14_01

NON-FERMENTED DAIRY INTAKE AND COGNITIVE FUNCTION IN OLDER ADULTS: A MENDELIAN RANDOMIZATION STUDY

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BACKGROUND AND OBJECTIVES
Meta-analyses of observational studies on the effect of dairy on cognitive function have yielded inconclusive RESULTS, potentially due to unmeasured confounding. To address this, we aimed to investigate the effect of the lactase persistence genetic variant, avoiding the no-unmeasured confounding assumption. The CC genotype is associated with lower lactase production and, consequently, lower non-fermented dairy consumption. We used it as an instrument to assess long-term consumption of non-fermented dairy and its effect on cognitive function.
METHODS

We included 43,836 individuals over 55 years old with genotyping, dietary assessment data, and cognitive function measurements from three population-based studies: CoLaus|PsyCoLaus (Switzerland), the Rotterdam Study (the Netherlands) and the Canadian Longitudinal Study on Aging (CLSA - Canada). We performed a one-sample Mendelian randomization using two-stage least-squares regression. First, we estimated non-fermented dairy consumption by T-allele frequency. Second, we used the estimated non-fermented dairy consumption in a linear regression model on cognitive function. General cognition, assessed by the Mini-Mental State Examination (MMSE) and the Mental Alternation Test, was our primary outcome. Secondary outcomes included measures of executive function, verbal fluency, verbal learning, and memory.

RESULTS

Per T-allele, non-fermented dairy intake was 15.3 grams/day higher in PsyCoLaus, 49.8 grams/day in the Rotterdam Study and 0.21 times/day in CLSA. We found no association between the genetically predicted difference and the MMSE in PsyCoLaus or the Rotterdam Study. Lactase persistent individuals scored 4.4 (95% CI 2.8-6.0) points more on average for the Mental Alternation Test in CLSA. Among secondary outcomes, there was a higher verbal fluency, verbal learning and executive function among lactase persistent individuals in CLSA. Such inconsistencies and the generally small magnitude of effect sizes may suggest that there is no real effect between non-fermented dairy intake and cognitive function.

CONCLUSIONS
The evidence for a causal effect of non-fermented dairy consumption on general cognitive function is weak, consistent with previous RESULTS from classic analysis from observational studies. This suggests that interventions targeting dairy consumption are unlikely to have a relevant effect on cognitive function.
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The authors have no conflict of interest.

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SOAP14_03

FRONT-OF-PACK NUTRITION LABELLING TO PROMOTE HEALTHIER DIETS: A FIVE-YEAR UPDATE ON CURRENT PRACTICE AND OPPORTUNITIES TO FURTHER STRENGTHEN REGULATION WORLDWIDE

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BACKGROUND AND OBJECTIVES

Unhealthy diets are a leading cause of death and disability globally. The WHO recommends Member States implement front-of-pack nutrition labels (FOPNL) as a 'best-buy' policy for addressing diet-related non-communicable diseases. The evidence base for FOPNL continues to evolve rapidly. Recent authoritative guidance from Codex Alimentarius Commission (2021) and WHO (to be finalised early 2025) supports government action but does not specify that countries should use a particular label. There is significant variation in FOPNL adopted by governments, and food industry resistance to progressive policies persists. This study aims to conduct an updated analysis of FOPNL regulations adopted worldwide to support policymakers to design and implement best-practice regulation.

METHODS

We use a framework for analysing public health law and available best-practice guidance to evaluate key components of FOPNL regulations endorsed by governments up to December 2024.

RESULTS

FOPNL adoption has grown, from 32 governments in 2019 to at least 45 in 2024, with over 15 of these using mandatory legislation. Label formats vary, reflecting WHO findings that there is no single best-performing format. There have been recent increases in use of summary indicator systems (e.g. Nutri-Score in 8 European countries) and nutrient-specific warning-style labels (e.g. 9 countries, particularly in the Americas region). Recently adopted FOPNL regulations provide updated insights on drafting of key terms such as regulatory objectives and specifications for label display to improve visibility and salience (e.g. in a uniform place on pack). There is a growing evidence base to support countries to develop valid scoring criteria, and increasing consideration of added sugars and ultra-processing as part of nutritional scoring. While data on FOPNL governance remains scarce, recent global guidance supports good governance of labelling regulations, including transparency and accountability in processes of label development, implementation, evaluation and enforcement to promote continuous improvement and withstand undue commercial interference.

CONCLUSIONS

Global interest in FOPNL remains high. Whether developing new FOPNL or reforming existing policies, these updated findings support policymakers to design and implement best-practice, evidence-informed regulations that are less likely to be contested successfully by industry and more likely to achieve public health impact.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP14_04

THE OFFSPRING'S B-CELL MATURATION PROCESS DURING THE SUCKLING PERIOD AND THEIR INSULIN SENSITIVITY IN ADULTHOOD ARE DIFFERENTLY IMPACTED DEPENDING FROM HYPERGLYCEMIC OR EUGLYCEMIC DAMS

Paul Bobin; Isabelle Grit[1]; Corentin Massias[1]; Pierre De Coppet[1]; Blandine Castellano[1]; Agnès David-Sochard[1]; Mikaël Croyal; Marie-Cécile Alexandre-Gouabau[1]; Gwenola Le Dréan[1]
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BACKGROUND AND OBJECTIVES

Gestational Diabetes Mellitus (GDM) is associated with a higher risk of type 2 diabetes (T2D) in offspring later in life, likely involving disruptions in pancreatic islets development and function in the newborn. During the breast-feeding period, β-cells undergo a maturation process that enhances their insulin secretory capacity. Furthermore, epidemiologic evidence highlights (1) the benefits of extended breastfeeding in reducing the risk of T2D in children born to mothers with GDM and (2) adaptations in the composition of GDM breast milk. However, the impact of breast milk composition during the critical βcell maturation period in the context of GDM remains unknown, even though breastfeeding represents a potential intervention target to mitigate the effects of maternal hyperglycaemia.

METHODS

We used a rodent model of maternal hyperglycaemia induced by a High Fat High Sucrose (HFHS) diet during gestation alone (4HFHS), or during gestation and lactation (7HFHS), compared to a Chow diet (euglycaemic CTL rats). Milk composition was characterised at postnatal day 1 (PND1) and at PND14 through analyses of fatty acids, amino acids, sphingolipids and lipidome profiles. The independent effects of the gestation and lactation periods were investigated by cross-fostering pups at PND0 among CTL, 4HFHS and 7HFHS dams. Pancreatic islets were isolated from offspring at PND0, PND14 and PND 220. Oral glucose tolerance tests were performed in adult offspring at PND60 and PND210, as well as euglycemic-hyperinsulinemic clamps at PND200.

RESULTS

Colostrum from 4HFHS; 7HFHS and CTL dams showed 3 distinct metabotypes. These differences in composition were maintained at PND14 in 7HFHS vs CTL milk. At PND0, pups born to hyperglycaemic mothers showed islet hypertrophy and hyperplasia associated to a lower percentage of β-cells. At PND14, genes involved in β-cells maturation (NeuroD, Glut2, Ins2) were increased, as well as plasma insulinemia and HOMA-β in pups nursed by 7HFHS versus 4HFHS dams. Moreover, at PND220, offspring nursed by CTL dams showed hyperglycemia (in males) and an insulin-sensitivity lower trend (in females) in response to a hypercaloric challenge from PND120 to PND220.

CONCLUSIONS

These preliminary RESULTS confirm that hyperglycaemia during gestation-lactation is associated with an adaptation of milk composition, and would have repercussions on offspring's β-cell maturation and metabolic trajectory later in their adult life according to their maternal glycemic status during gestation and lactation.

CONFLICTS OF INTERESTS

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SOAP14_06

BENEFICIAL EFFECT OF FLAVONOIDS INTAKE ON HDL-C IN INDIVIDUALS WITH METABOLIC SYNDROME

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BACKGROUND AND OBJECTIVES

Chronic inflammation and oxidative stress are related to metabolic syndrome (MetS) pathophysiology. Flavonoids are dietary compounds with antioxidant and anti-inflammatory properties, which improve the metabolic profile of MetS. This study aimed to evaluate the association between dietary polyphenol intake and MetS components.

METHODS

A total of 224 individuals of both sexes, with a mean age of 50.8 years, diagnosed with MetS according to the National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATP III) were included in the study. Two 24-hour dietary recalls were applied to assess dietary intake. Flavonoids intake was estimated using the Brazilian Food Composition Table, Phenol-Explorer, and United States Department of Agriculture (USDA) data. The main foods that contributed to flavonoids intake were calculated by their contribution percentage. Binary logistic regression models evaluated the association between flavonoids intake and MetS components

RESULTS

A total of 172 (76.8%) of the total participants were women. More than half were physically active or very active (52.9%). The median flavonoids intake was 54.0 mg/1000kcal/d (aglycone equivalent), and the subclasses distribution was flavones, flavonols, flavan-3-ols, flavanones, anthocyanins, and isoflavonoids. The individual compounds most taken were epicatechin, apigenin, and procyanidin dimer B2. Beans, oranges, and orange juice were the main foods contributing to flavonoids intake. Flavonoids intake was protective against low HDL-c concentrations (third vs. first tertile of intake, OR=0.35; 95%CI 0.13-0.88). No significant association was observed between other tested variables.

CONCLUSIONS

Higher dietary flavonoids intakes were associated with increased HDL-c, suggesting a likely beneficial effect of these compounds in attenuating cardiometabolic risk factors for MetS.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP14_07

ASSOCIATION BETWEEN BLOOD PRESSURE AND WAIST-TO-HEIGHT RATIO IN SCHOOLCHILDREN AGED 6 TO 8 YEARS IN THE VALPARAÍSO REGION, CHILE

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BACKGROUND AND OBJECTIVES

Hypertension is a serious obesity-related disease that affects the pediatric population The incidence of pediatric hypertension is increasing worldwide, driven by rising rates of childhood obesity.7,8. In Latin America, recent studies have reported rates of altered blood pressure (ABP) that vary between 0.7% and 40.5% in children and adolescents.10 In Chile, a prevalence of 20.8% has been observed in the child population. In Chile, data from the nutritional map of the National School and Scholarship Board for the year 2023 showed that 49.3% of children entering the first year of elementary school in public schools are overweight and obese, and of these, 25.8% are severely obese, that is, 3 out of every 5 schoolchildren in Chile already have weight problems at an early age. This situation, if maintained over time, will prematurely confront them with cardiovascular risks, high blood pressure, metabolic alterations, diabetes and metabolic syndrome in adolescence, which will possibly extend into adulthood. Objective. To associate systolic and diastolic blood pressure with waist-to-height ratio (WHR) in schoolchildren aged 6 to 8 years.

METHODS

Cross-sectional study. The sample included 300 schoolchildren aged 6 to 8 years from Valparaíso. Blood pressure, waist circumference and height were evaluated. Data were collected during 2015, 2018, 2019 and 2022. Blood pressure was assessed according to the criteria of the American Academy of Pediatrics (2017). Statistical analysis: RESULTS were expressed as mean, 95% confidence interval (95% CI) for quantitative variables and qualitative variables were expressed in absolute (n) and relative (%) frequencies. Normality was verified with the Shapiro Wilk test ($p>0.05$). Associations were made between altered blood pressure and anthropometric variables (BMI, waist circumference, nutritional status) using the Proportion test and Chi Square test. Three different models were developed to determine the association between altered BP with WHR, WC and NS, adjusting for age in all models.

RESULTS

There is a relationship between systolic blood pressure and waist-to-height ratio in children aged 6 to 8 years ($p=<0.0073$).

CONCLUSIONS

Increase in blood pressure in the pediatric population is directly associated with an increase in waist-to-height ratio of >0.5. Therefore, controlling this ratio can help prevent the onset of metabolic diseases.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP14_08

MOTIVATION AND OBSTACLES TO DIETARY MODIFICATION PROGRAM AMONG URBAN POOR HYPERTENSION PATIENTS

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BACKGROUND AND OBJECTIVES

The study aimed to explore factors and barriers that influence the adherence to a dietary and lifestyle intervention among urban poor diagnosed with hypertension. After a year of dietary intervention, a qualitative study was conducted to assess the acceptability, enabling factors, and barriers in the intervention program among the participants.

METHODS

Participants were selected based on purposive sampling and either a compliant participant or partial or drop-outs from the intervention program. Urban poor housing complexes continue to be the setting for this study, following the intervention program that was conducted there. Three focus groups were formed, and discussion sessions were conducted to assess the participants' understanding of the program, their adherence, and changes in behaviour. Discussions were conducted until saturation was achieved. Data management and analysis involved transcription and translation of discussions, decoding using Microsoft Word and Excel, and using Nvivo for Windows software. Thematic analysis was used to analyze qualitative data, with themes revised and defined according to study objectives.

RESULTS

Four major themes come out from this; Understanding Healthy Lifestyle and Managing Hypertension, the Application of Dietary and Cooking Modification, Application of Blood Pressure Monitor and Nutrient Information through Food Labelling. From the discussion, mainly social and food environment really affecting their adherence to the intervention program, especially in changing diet and lifestyle. Family taste preferences and abundance of fast food eatery around their place can become barrier towards changing their diet and managing their blood pressure.

CONCLUSIONS

Based on these, it shows that any intervention program should not only focusing on the participant or the patient itself but should also include the whole family to empower them with knowledge and prevent them from getting other non-communicable diseases aside from hypertension.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP14_09

ULTRA-PROCESSED DIETARY PATTERN ADHERENCE AND IRRITABLE BOWEL SYNDROME: EVALUATING THE ASSOCIATION USING DIFFERENT DIAGNOSTIC METHODS

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BACKGROUND AND OBJECTIVES

Ultra-processed foods (UPFs), as defined by the NOVA classification system, are ready-to-consume formulations comprised of processed food substances and sensory-related additives designed to displace fresh or minimally processed foods and freshly prepared dishes and meals while maximizing industry profits (1). While several longitudinal studies in high-income countries have demonstrated that UPF consumption increases the risk of chronic diseases including gastrointestinal disorders, fewer studies have been conducted in lower income settings (2). This study aims to assess the prospective association between adherence to an ultra-processed dietary pattern and the incidence of irritable bowel syndrome (IBS) in Brazil using different diagnostic methods.

METHODS

Data from over 10,000 adult participants of the web-based, nationwide NutriNet Brasil cohort were utilized. Dietary intake was assessed at baseline with at least two 24-hour dietary recalls using the Nova24h tool. New cases of IBS were identified through two methods: the Rome IV criteria and self-reported medical diagnoses by participants. The association between the UPF dietary share (% of total energy intake) and IBS incidence was estimated using Cox proportional hazards models for each diagnostic method separately.

RESULTS

Over an average follow-up of 2.8 years, 177 new cases of IBS were identified through self-reported medical diagnoses, while 775 cases were identified using the Rome IV criteria. Adjusted models indicated a significant increase in IBS risk across quartiles of UPF dietary share for both diagnostic methods. For self-reported medical diagnoses, comparing the lowest quartile to the highest quartile of UPF consumption, the risk of developing IBS increased by 1.65 (95% CI: 1.04-2.62). Similarly, when outcomes were assessed using the Rome IV criteria, the risk increased by 1.30 (95% CI: 1.05-1.60).

CONCLUSIONS

This study provides compelling evidence that a higher intake of UPFs is associated with an increased risk of developing IBS in the Brazilian adult population, regardless of the diagnostic method used. These findings underscore the necessity for public health strategies aimed at reducing UPF intake to mitigate the growing burden of diet-related diseases, including IBS.

CONFLICTS OF INTERESTS
none

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SOAP14_11

ASSOCIATIONS OF FASTING BLOOD GLUCOSE AND HBA1C WITH FIBRINOGEN AND BLOOD CLOT CHARACTERISTICS AND INTERACTIONS WITH OF GENETIC POLYMORPHISMS

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BACKGROUND AND OBJECTIVES

Cardiovascular disease (CVD) and type 2 diabetes (T2DM) are prevalent health issues, with T2DM contributing to a prothrombotic state that increase CVD risk through complex, not fully understood mechanisms. This study investigates both fibrinogen and its γ' variant, elucidating how genetic factors related to fibrinogen production and glycaemic control impact clot structure and stability.

METHODS

Fasting blood glucose (FBG) and glycated haemoglobin (HbA1c), total and γ' fibrinogen, as well as turbidimetrically determined plasma clot properties, were quantified and fibrinogen and *FXIII* SNPs were genotyped in 2,010, apparently healthy Black South Africans.

RESULTS

FBG showed a higher prevalence of euglycaemia (83.2%) than HbA1c (59.8%). Women had higher proportions of prediabetes and likely diabetes, particularly in HbA1c levels than men. Fibrinogen increased over clinical categories of increasing HbA1c and FBG ($p=0.00001$ and $p=0.03$). Fibrinogen increases with higher HbA1c and FBG levels, particularly among those at elevated risk, with differences observed across the whole group and by gender ($p < 0.001$). Although γ' fibrinogen levels tend to rise with HbA1c, we did not observe changes across FBG categories and lag time remained stable across all groups ($p > 0.05$). Slope decreased in high-risk FBG categories for the whole group ($p = 0.002$) and women ($p = 0.007$), while maximum absorbance varied among women and across FBG categories ($p < 0.05$). Clot lysis time (CLT) is prolonged in higher HbA1c and FBG categories, particularly among men ($p < 0.05$). Specific fibrinogen gene polymorphisms (*FGB* rs7439150, rs1800789, rs1800787, rs1800791, rs4220 and *FGG* rs1049636)—but not *FXIII*—demonstrated interactions with glucose markers, influencing total fibrinogen, γ' fibrinogen, and specific blood clot properties, namely maximum absorbance and CLT ($p < 0.005$). Notably, these polymorphisms did not affect lag time or slope.

CONCLUSIONS

Elevated HbA1c and FBG levels are associated with increased fibrinogen concentration and prolonged CLT, indicating a potential link between heightened glucose levels and a pro-thrombotic state, with additional variations observed in slope and maximum absorbance based on gender and risk category as well as gene-glucose milieu interactions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP14_14

TAXATION OF FOODS HIGH IN FAT, SUGAR AND SODIUM IN INDIA: A MODELLING STUDY OF HEALTH AND ECONOMIC IMPACTS

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BACKGROUND AND OBJECTIVES

The consumption of foods high in fat, sugar, and sodium (HFSS) is rapidly increasing in India. Adult overweight and obesity levels have increased fourfold since 1975. The taxation of HFSS foods has been proposed to promote healthier diets. This study estimates the effect of this approach on nutrient intakes, diet-related diseases, and associated health burden and economic benefits.

METHODS

Nationally representative household expenditure survey data, dietary requirements, and food composition tables are used to proxy individual nutrient intakes. Consumer responsiveness to food price changes for three income terciles is estimated using an Almost Ideal Demand System model, to assess the impact of tax scenarios on food purchases and nutrient intakes. Longer-term policy impacts are estimated through a microsimulation model (Health-GPS), projecting policy outcomes in India, assuming an increasing cumulative trend in ultra-processed food intake. Estimated policy outcomes include changes in risk exposures, disease incidence and burden, healthcare demand and expenditure, and government tax revenue.

RESULTS

Applying the current highest Goods and Services Tax (GST) rate of 28% on HFSS foods based on the Food Safety and Standards Authority of India (FSSAI) 2022 draft definition is associated with a persistent average per capita decrease of 0.10 kg/m2 in body mass index and 20 mg in daily sodium intake. Over 30 years, this seemingly small average, population-wide, effect translates into a large cumulative reduction of 9 million cases and 19 million DALYs from ischemic heart disease, chronic kidney disease, stroke, diabetes, and asthma and USD 15 billion averted total health expenditure. Effects are larger for higher-income households. This is associated with a 20.8% increase in tax revenue and minor decreases in household spending. Applying a higher GST rate of 40% (current highest rate plus CESS, as for SSBs) would lead to larger effects.

CONCLUSIONS

The alignment of GST rates with nutrition and health objectives, targeting HFSS foods with higher rates, may provide critical incentives to improve dietary choices. It could mitigate rising diet-related diseases and morbidity, reduce healthcare costs and represent an important revenue source for the government. Food taxation with front-of-pack labelling and marketing restriction could achieve a larger impact.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP14_15

THE ASSOCIATION BETWEEN GAMMA-GLUTAMYL TRANSFERASE AND METABOLIC SYNDROME AND ITS COMPONENTS AMONG ADOLESCENTS APPLYING INTERNATIONAL DIABETES FEDERATION (IDF) AND COOK'S CRITERIA

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BACKGROUND AND OBJECTIVES

The prevalence of metabolic syndrome (MetS), a cluster of metabolic abnormalities, is rising globally, particularly in the Middle East and North Africa region. Gamma-glutamyl transferase (GGT) is gaining attention as a biomarker for liver function and its association with MetS and its components.

METHODS

This cross-sectional study is part of the Tehran Lipid and Glucose Study (TLGS). We included 696 adolescents (347 males), aged 10-19 years, from the seventh examination survey (2018-2021). MetS was defined using both the International Diabetes Federation (IDF) and Cook's criteria. Serum GGT was measured, and its association both as a continuous and categorical variable, was assessed with MetS and its components using logistic regression, adjusting for potential confounders including age, sex, smoking, family history of type 2 diabetes mellitus, alanine aminotransferase (ALT), as well as other MetS components.

RESULTS

MetS prevalence was 15.66% and 9.19% according to Cook's and IDF criteria, respectively. Higher GGT levels were significantly associated with increased MetS risk by both definitions (odds ratio [95% confidence interval] = 1.28 [1.12-1.46] and 1.30 [1.14-1.49] per 5 U/L increase, respectively) after adjusting for age, sex, smoking, and family history of type 2 diabetes mellitus (T2DM). This association was attenuated upon adjusting for ALT levels. GGT levels were robustly associated with high waist circumference, with odds ratios of 1.98 [1.59-2.46] and 1.71 [1.38-2.11] per 5 U/L increase, respectively, even after adjusting for ALT. Associations with high blood pressure (21% and 17% increased risk by IDF and Cook's criteria) and triglycerides (13% and 16% increased risk by IDF and Cook's criteria) were significant but attenuated after ALT adjustment. No significant associations were found between GGT levels and high fasting plasma glucose or low high-density lipoprotein cholesterol.

CONCLUSIONS

Elevated serum GGT is strongly associated with a higher risk of MetS and its components, particularly central obesity, in adolescents. These findings suggest GGT as a valuable biomarker for early MetS detection.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 32 - NON COMMUNICABLE DISEASES

SOAP32_01

DIETARY INFLAMMATORY INDEX AND ITS ASSOCIATION WITH METABOLIC SYNDROME AND CAROTID INTIMA-MEDIA THICKNESS IN CHILDREN AND ADOLESCENTS: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

While the association between dietary inflammatory index (DII) and cardiometabolic outcomes is well-studied in adults, little is known about these relationships among children and adolescents. This systematic review aims to evaluate the association of DII with carotid intima-media thickness (CIMT) and metabolic Syndrome (MetS) in children and adolescents.

METHODS

We searched the publications in three literature databases (PubMed, Web of Science, and Scopus) for studies published between 1 January 2000 and 1 August 2024, which assessed the association of DII with MetS or CIMT among children and adolescents. Two reviewers screened and assessed the quality of studies using the Newcastle-Ottawa-Scale. Given the heterogeneity of study designs, a narrative synthesis approach was employed.

RESULTS

Out of 23,393 records identified, a total of 9 studies (four prospective cohort and five cross-sectional) met our inclusion criteria and were qualified; including six and three studies focused on MetS and CIMT as the outcome, respectively. These studies were focused on children and adolescents between 6 and 19 years of age from both sexes with a cumulative population of over 16,000 participants. The RESULTS on DII-CIMT association were conflicting, with two studies noting no associations, while another study observed a 2.46-fold higher risk for increased CIMT. The majority of studies assessing the DII-MetS association, observed a positive association with higher DII, conferring a higher risk of MetS up to three-fold.

CONCLUSIONS

Higher DII scores are associated with an increased risk of MetS in children and adolescents, though findings for CIMT are inconsistent. Further longitudinal studies are needed to clarify these associations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP32_03

PREVALENCE OF IRON DEFICIENCY ANAEMIA, OVERWEIGHT AND OBESITY AMONG WOMEN OF REPRODUCTIVE AGE IN MOROCCO

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BACKGROUND AND OBJECTIVES

Iron deficiency anaemia and obesity are two major public health concerns that disproportionately affect women of reproductive age (WRA), particularly in low- and middle-income countries. In Morocco, 61.3% of WRA are overweight or obese, with an obesity prevalence of 30.4%. At the same time, 34.4% of women of childbearing age are anaemic, and 49.7% suffer from iron-deficiency anaemia.

This study aims to estimate the prevalence of iron deficiency anaemia, overweight, and obesity among Moroccan women of reproductive age, with a particular focus on the coexistence of anaemia due to iron deficiency alongside overweight and obesity.

METHODS

This national cross-sectional study included a representative sample of 2090 WRA from the general Moroccan population. The data collection encompassed socio-economic parameters, anthropometric measurements and blood samples. Haemoglobin levels were assessed using photometric biosensor (Hemocue), while ferritin and C-reactive protein (CRP) were measured using immunoturbudimetry.

RESULTS

The prevalence of overweight/obesity among Moroccan WRA was 60.2%, iron deficiency was observed in 30.6%, and 34.4% of women were anaemic and 50.0% suffering from iron deficiency anaemia. The coexistence of overweight/obesity with anaemia was 19.2% and with iron deficiency it was 16.3%. Among overweight/obese women, 32.5% were anaemic, 28.4% had iron deficiency, and 47.6% suffered from iron deficiency anaemia. Notably, the prevalence of DBM was higher in urban areas compared to rural areas.

CONCLUSIONS

The coexistence of anaemia and overweight/obesity among Moroccan women highlights the double burden of malnutrition, necessitating integrated public health policies and national strategies to address both conditions simultaneously.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP32_04

A LONGITUDINAL ASSESSMENT OF THE RELATIONSHIP BETWEEN LIFESTYLE-RELATED RISK FACTORS AND A COMPOSITE CVD RISK INDEX AMONG ADOLESCENTS IN MALAYSIA: THE MYHEARTS

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BACKGROUND AND OBJECTIVES

The escalating prevalence of cardiovascular (CVD) risk factors and anticipated doubling of CVD burden in Malaysia is indeed worrisome. Strong associations have been shown between risk factor levels and the extent of atherosclerosis in adolescence. It is imperative that risk factors associated to CVD be optimally managed from young. The study aims to create a composite risk index of CVD among adolescents and examine the influence of demographic, socioeconomic and lifestyle-related risk factors on the composite risk index of biological CVD risk factors among adolescents aged 13 to 17 years in Malaysia.

METHODS

A total of 1320 adolescents from the Malaysian adolescent cohort were assessed from baseline at 13 years in 2012 and followed up at 15 and 17 years from 2014 to 2016. Eight biological CVD risk factors (consisting 3 components of blood pressure, cholesterol and body composition) with moderate correlation were identified. Subsequently, these risk factors were standardized and averaged to form a composite CVD risk index used as the outcome variable. Generalised estimating equation (GEE) using longitudinal linear regression was used to examine the effect of changes in adolescent lifestyle-related risk factors on the composite CVD risk index over time.

RESULTS

From the ages 13 to 17 years, both time periods; time 3 (β = -0.112, 95% CI = -0.170, -0.054) and time 2 (β = -0.068, 95% CI = -0.113, -0.022), female (β = 0.083, 95% CI = 0.010, 0.156), Chinese (β = 0.124, 95% CI = 0.012, 0.236), physical fitness (β = -0.002, 90% CI = -0.003, 0.00002, $p<0.10$) and BMI (β = 0.070, 95% CI = 0.061, 0.079) were significant predictors of attaining high scores of CVD risk.

CONCLUSIONS

Female adolescents were at higher risk of having increased CVD risk score compared to males. Compared to Malays, Chinese adolescents were at higher risk of increased CVD risk score. A minimal reduction in overall CVD risk score was found for increased physical fitness over time. Body mass index was highly significant and the strongest predicting factor for CVD risk during the adolescent period. A more robust and perhaps gender-specific Intervention programme focusing on healthy lifestyle (including maintaining ideal BMI and improving physical fitness) need to be implemented among school-going adolescents in Malaysia.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP32_08

RELATION BETWEEN PLASMA RETINOL LEVEL WITH DIFFERENT TYPES OF DYSLIPIDEMIA IN THE MIDDLE-AGED AND THE ELDERLY: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

The plasma retinol level is used as a recommended standard to evaluate the individual's nutritional status of vitamin A. Change of blood retinol level is strongly associated with lipid metabolism disorders. Therefore, the accurate relation between plasma retinol level with different types of dyslipidemia need exploration.

METHODS

A total of 538 dyslipidemia and 1116 healthy middle-aged and elderly subjects from the communities of Beijing were investigated. The Chi-square test and one-way ANOVA were used to compare the demographic characteristics. The general linear model was used to compare dietary consumption and plasma biochemical parameters. Person correlation analysis was used to explore the relationship between plasma retinol and lipids. Binary logistic regression and restricted cubic spline (RCS) were conducted to explore the association between plasma retinol and the risk of different type of dyslipidemia and the dose-response relationship.

RESULTS

A significantly positive correlation between plasma retinol level with LDL-C and negatively correlation with HDL-C was observed. These correlations changed in patients with different types of dyslipidemia. Compared to the participates with Q1 level of plasma retinol (<0.420μg/ml), Q2 (0.420-0.526μg/ml), Q3 (0.527-0.657μg/ml) and Q4 (>0.657μg/ml) levels showed significantly increased risk of dyslipidemia and mixed dyslipidemia. And participants with Q4 level of plasma retinol showed a sharp increased risk of hypertriglyceridemia combined with low high-density lipoprotein cholesterolemia. The RCS RESULTS indicated a non-linear (U-shaped) relation between plasma retinol and the risk of low high-density lipoprotein cholesterolemia.

CONCLUSIONS

Elevation in plasma retinol (above 0.525 μg/ml) indicated a significantly increased risk of dyslipidemia. The recommended plasma retinol level for the middle-aged and the elderly should be different type of dyslipidemia-dependent.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP32_09

DEVELOPING A COMPREHENSIVE DIETARY INTERVENTION PACKAGE TO REDUCE THE DIETARY INFLAMMATORY INDEX (DII) IN PATIENTS WITH CORONARY ARTERY DISEASE (CAD) IN INDIA

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BACKGROUND AND OBJECTIVES

Indian diets are diverse, offering a range of vital nutrients with anti-inflammatory potential. Yet they are often grain-heavy, with low intakes of vegetables, fruits, legumes, and nuts, and deteriorate further with increased consumption of sugars, salt, and processed foods. Robust evidence supports the cardioprotective benefits of anti-inflammatory diets like the Mediterranean diet (MD). Promoting such diets in the Indian context is crucial to reducing inflammation-related diseases like Coronary Artery Disease (CAD). Our goal was to create a personalized intervention for CAD patients, incorporating traditional foods aligned with the MD pattern for heart-healthy, low Dietary Inflammatory Index (DII) diets.

METHODS

Anti-inflammatory Indian foods comparable with the MD food items were identified and used for formulating standardized recipes and diet plans. Comprehensive food plans with well-balanced distribution of food groups across three major and three minor meals were developed. These were complimented with good cooking practices and lifestyle advice. The DII score of diet plans consisting of recipes with anti-inflammatory foods was computed.

RESULTS

A total of 117 customized anti-inflammatory season-specific (summer and winter) recipes A total of 117 customized anti-inflammatory season-specific (summer and winter) recipes were developed. These were incorporated into calorie-specific diet plans (1200, 1400, 1600, 1800, and 2000 Kcal) in 7-day cyclic menu formats. These customized diet charts were complemented by a booklet with general dietary guidelines, recipes, cooking instructions, portion size guides, eating-out advice, healthy snack choices, and lifestyle advice. The overall DII scores of the diet plan showed a high anti-inflammatory potential **(-7.8 to -8.4**) nearing the theoretical minimum (-8.87) reported. The DII of recipe combinations in one representative diet chart for all the three main meals was observed to fall within the following ranges: breakfast (**-2.61 to -5.83)**, lunch (**-7.12 to 4.10**), and dinner (**-7.12 to 4.16)**.

CONCLUSIONS

The low DII scores of these customized recipes provide evidence to enable the promotion of anti-inflammatory diets in the Indian context. The calorie-specific diet charts and patient information booklet are valuable take-home resources to support better health outcomes for CAD patients and their families. These can make a significant impact on patient knowledge, reinforce understanding, and help in improved compliance and health outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP32_10

DIETARY PATTERN OF USERS OF LARGER CITY PARKS IN COLOMBO COMMERCIAL CITY, SRI LANKA

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BACKGROUND AND OBJECTIVES

Regular park users are usually those who have initiated a process to be healthy. The objective was to assess the dietary habits among users of larger city parks in Colombo Commercial City.

METHODS

A community based descriptive cross-sectional study was conducted enrolling 411 users of six active large city parks in Colombo Commercial City by using systematic sampling technique. Pre-tested interviewer administered questionnaire was used in data collection which included a validated Food Frequency Questionnaire. SPSS version 26.0 was used for analysis. Chi square test with p value<0.05 was used to determine the level of significance.

RESULTS

The mean age of the park users were 55.09 years (SD: 11.22). Majority (65.9%) were males, and professional accounted for 40.4. More than half of the park users were in the normal BMI category (51%) while 38.9% were overweight. Of them 43.5% stated they had diabetes mellitus, 44.3% hypertension 39.9% dyslipidaemia and 11.4% ischemic heart disease.

Most of the park users ate three main meals (70.3%), one snack (50.4%) and consumed tea or coffee two times (54.7%) per day. Further a 7.5% park users ate away from home (7.5%) Most ate fried food 1-3 times per week (28.0%). Majority park users preferred water (89.8%and only 3.9% (n=16) preferred a sugar sweetened beverage after a meal.

A dietary score for fiber, antioxidants and energy dense food was calculated and their median values were 1.00, 0.56, and 2.33. This was later categorized as optimum and suboptimum where 94.2%, were classified as optimum diet, although the level of consumption of energy dense food was high.

25.1% stated that a good diet can achieve good health (25.1%), and adding salt (73.8%) and sugar (37.2%) was seen to be important to have better taste in food.

CONCLUSIONS

Although people come to the parks to be active and healthy it was seen that theses is room for improvement in the dietary beahvious and attitudes calling for promoting healthy eating and exploration of determinants of dietary behaviours

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP32_12

DEVELOPING MACHINE LEARNING MODELS TO PREDICT GASTROINTESTINAL CANCER RISK USING LIFESTYLE, DIETARY FACTORS, AND BIOMARKERS IN A COHORT STUDY

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BACKGROUND AND OBJECTIVES

Dietary factors play a critical role in cancer etiology but are underrepresented in predictive models for gastrointestinal (GI) cancer risk. The variability and limited availability of dietary intake data present significant challenges to developing robust machine learning (ML) models. This study aimed to develop and evaluate ML models to predict GI cancer risk by leveraging longitudinal data on dietary intake, lifestyle behaviors, and biomarkers from a South Korean cohort.

METHODS

We followed 7,862 adults (158 GI cancer cases and 7,704 controls) over 16 years. Anthropometric measures, clinical biomarkers, and dietary intake data were collected, with the latter assessed using a validated 106-item semi-quantitative food frequency questionnaire. Four ML models—logistic regression, random forests, gradient boosting machines, and support vector machines—were developed and evaluated. Among the 41 predictive features, 24 represented dietary intake variables. Tailored data sampling and model training approaches were applied to address class imbalance, enhancing the accuracy of predictions for minority-class outcomes (GI cancer cases).

RESULTS

Initial ML models showed inadequate performance predicting GI cancer risk due to class imbalance, achieving zero precision for GI cancer cases and high precision for controls (0.98). The proposed data sampling, model training, and feature selection strategies improved precision and F1-scores for GI cancer predictions by over 70%. Some models achieved a ROC-AUC score exceeding 0.8, precision above 0.7, and an F1-score above 0.7 on unseen test data.

CONCLUSIONS

Addressing class imbalance using tailored approaches substantially enhanced the predictive performance of ML models for GI cancer risk. These METHODSoffer applicability to other datasets and cancers with similar challenges. The combined predictive value of data on diet, lifestyle, and biomarkers provides a robust foundation for data-driven GI cancer screening and prevention strategies.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP32_13

WHOLE GRAIN, HEART DISEASE AND MULTIMORBIDITY: A 15-YEAR POPULATION-BASED STUDY OF 146,329 ADULTS AGED 45 AND OLDER

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BACKGROUND AND OBJECTIVES

The health benefits of whole grains on heart disease are well established. However, research on the effects of whole grains on multimorbidity remain limited, which is the focus of our study.

METHODS

We retrospectively analysed data from the 45 and Up Study, a population-based study, spanning the period from 2005 to 2020. We followed 146,329 individuals aged ≥45 years, with no history of heart disease or multimorbidity at baseline, over a 15-year period. Dietary information was collected using a short food frequency questionnaire. Generalized Estimating Equation models were used to assess the longitudinal effects of whole grains on heart disease and multimorbidity (two or more chronic conditions).

RESULTS

During the first follow-up (2012-2015), 25,173 participants developed multimorbidity, with an additional 9,824 cases developed in the second follow-up (2018-2020). After multivariable adjustment, compared to individuals with lower consumption of brown/wholemeal bread, consuming more than seven slices weekly was associated with a 9% lower risk of heart disease (Odds Ratio (OR)=0.91, 95% CI: 0.87-0.95) and a 12% lower risk of multimorbidity (OR=0.88, 95% CI: 0.86-0.91); eating over 14 slices reduced risk of heart disease by 27% (OR=0.73, 95%CI:0.69-0.77) and multimorbidity by 34% (OR=0.66, 95% CI: 0.64-0.68). Regular whole grain cereal consumption lowered heart disease risk by 42% (OR=0.5895% CI: 0.56-0.61) and multimorbidity risk by 44% (OR=0.56, 95% CI: 0.54-0.57).

CONCLUSIONS

Whole grains are beneficial in lowering the risk of heart disease and multimorbidity. The implementation of whole grain inclusion as a healthy diet is necessary to prevent multimorbidity.

CONFLICTS OF INTERESTS
S.G.is in Governing Board of the Whole Grain Initiative, Australia

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SOAP32_14

A FLAVONOID-RICH DIET IS ASSOCIATED WITH A LOWER RISK OF CHRONIC KIDNEY DISEASE: A UK BIOBANK PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES

Flavonoids may improve kidney function. However, large-scale prospective studies are limited. Therefore, we conducted a population-based prospective study to investigate the relationship between flavonoid intakes, risk of chronic kidney disease (CKD), and all-cause mortality among individuals with CKD.

METHODS

We examined associations between a Flavodiet score (FDS), individual flavonoid-rich foods, and flavonoid sub-classes (based on ≥2 24-hour dietary assessments) and a) CKD risk among 109,954 adults, and b) all-cause mortality among 3,052 participants with CKD, aged 40-69 years using multivariable Cox regression analyses. Additionally, we used mediation analysis to examine potential mechanisms of action.

RESULTS

Over a median 10.5 years of follow-up, 4,307 cases of incident CKD were identified. A higher FDS (median 6 servings of flavonoid-rich foods per day) was associated with a 16% lower risk of CKD (HR (95% CI) Q4 vs Q1, P trend = 0.84 (0.77, 0.92), <0.001), in part mediated by levels of triglycerides (2.8%), high-density lipoprotein (5.8%), glycated hemoglobin (2.1%), Cystatin-C (16.8%), and C-reactive protein (2.2%). Additionally, we observed significant inverse associations between a range of flavonoid-rich foods (apples, oranges, berries, dark chocolate, and red wine) and flavonoid subclasses (anthocyanins, proanthocyanidins, flavonols, flavanones, and flavones) and CKD risk. In participants with CKD, a higher FDS (median 6 servings per day) was associated with a 35% lower risk of all-cause mortality (HR (95% CI) Q4 vs Q1, P trend: 0.65 (0.48, 0.88), 0.03), with greater intakes of tea, proanthocyanidins, theaflavins and thearubigins, flavonols, and flavan-3-ols also showing significant inverse associations with lower risk of all-cause mortality in participants with CKD.

CONCLUSIONS

A diet rich in flavonoids, characterised by a median 6 servings per day of commonly consumed flavonoid-rich foods such as apples, tea, and berries, was associated with a lower risk of CKD, and a lower risk of all-cause mortality in adults with CKD. Simple dietary adjustments to increase the consumption of these readily available foods and beverages could help lower CKD risk and improve prognosis in individuals with CKD.

CONFLICTS OF INTERESTS

AC acts as an advisor to the US Highbush Blueberry Council (USHBC) grant committee and has received funding from them for a randomized control trial and population-based work.

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SOAP32_15

A REVIEW OF POTASSIUM ENRICHED LOW SODIUM SALT STANDARDS AND RECOMMENDATIONS IN CLINICAL MANAGEMENT GUIDELINES IN CHINA: IMPLICATIONS FOR SCALING UP ITS USE GLOBALLY

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BACKGROUND AND OBJECTIVES

Potassium enriched low sodium salt (LSS) lowers blood pressure by both reducing sodium intake and increasing potassium intake. LSS usage remains low in China, despite a mature and varied LSS market. To understand if the low usage could be related to LSS standards and recommendations in clinical management guidelines, we carried out a review.

METHODS

All standards and clinical management guidelines were identified through a systematic search of literature of two academic websites Wan Fang and CNKI, and academic or government websites since 1996. Inclusion criteria include 1) LSS standards or salt standards containing LSS definitions, 2) latest clinical management guidelines of diseases related to effects of LSS, including hypertension, cardio or cerebrovascular diseases, and kidney disease, 3) dietary and salt reduction guidelines.

RESULTS

Thirty-nine LSS standards and clinical management or salt reduction guidelines were identified, including 7 salt or LSS standards, 29 clinical management guidelines, and 2 salt reduction and one dietary guideline. LSS was firstly recommended by Chinese Guidelines for Management of Hypertension (2010), followed by Dietary Guidelines for Chinese Residents (2016). The first LSS standard was released in 1995; a single mandatory edible salt standard with an LSS definition was released in 2015. Besides sodium chloride (NaCl), other components and their proportions of LSS changed over time from potassium chloride (KCl) and magnesium sulfate in 1995 to only KCl in 2015. The 2015 standard introduced the first (and current) mandated warning statement “LSS should be cautiously used among people who are not suitable for high potassium intake, such as high-temperature workers, heavy-labour workers, patients with renal dysfunction and hypertensive patients taking antihypertensive drugs.” For clinical guidelines, 10 of 13 hypertension, 4 of 7 cardiovascular disease, 2 of 4 cerebrovascular disease, and 3 dietary or salt reduction guidelines recommended LSS use. Yet, the recommendations were inconsistent, particularly in terms of use among people with CKD. For example, ‘People with good kidney function are recommended to choose LSS.’, ‘People with renal dysfunction should consult doctors before potassium supplement.’, ‘intake of LSS is recommended for patients with stage 1 to 3 CKD.’ One of 5 kidney guidelines suggested “not to use LSS”.

CONCLUSIONS

To date the standards and guidelines are not consistent. Ensuring coherence between salt standards and various clinical guidelines will be important to increase uptake of LSS globally.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP32_16

THE EFFECTS OF ELDERBERRY SUPPLEMENTATION ON SYSTEMIC AND TISSUE-LEVEL MARKERS OF CARDIOMETABOLIC HEALTH IN OVERWEIGHT AND OBESE OLDER ADULTS: A RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Weight gain in older age is associated with cardiovascular disease and type 2 diabetes. As adipose tissue (AT) expands, immune cells infiltrate AT and promote tissue dysfunction and ectopic fat deposition in peripheral tissues (e.g. skeletal muscle (SkMus)). Black elderberry (Sambucus nigra L.) is rich in polyphenols. The objectives of this study were to investigate the effects of 4 weeks elderberry supplementation on SkMus and AT global proteome and on circulating markers of inflammation and cardiometabolic health.

METHODS

Twenty-four overweight and obese older adults (29.4 ± 3.8 kg/m²; 66.3 ± 4.7 yrs) supplemented with a standardised black elderberry extract (ElderCraft® 2,000 mg/day containing 302 mg anthocyanins) or placebo daily for 4 weeks. Subcutaneous AT and SkMus biopsies, serum inflammatory markers, and blood pressure were taken at baseline (D0) and post-supplementation (D28). Tandem-mass-tagged proteomic analysis was performed on tissue samples (Reactome differential pathway analysis via CAMERA algorithm).

RESULTS

Proteomic analysis identified 3,331 (AT) and 2,651 proteins (SkMus), with significant alterations in 21 (AT) and 24 (SkMus) pathways. In AT, this included an upregulation of proteins involved in keratinisation (FDR = 0.01; LogFC = 0.42) , apoptosis (FDR = 0.03; LogFC = 0.24), and clotting cascade (FDR = 0.02 ; LogFC = 0.34), and a downregulation of proteins related to energy metabolism (lipids, glycogen, branched-chain amino acids), aerobic respiration (FDR = 0.02; LogFC = -0.15) and epigenetic regulation of adipogenesis (FDR = 0.05; LogFC = -0.23). In SkMus, elderberry induced the upregulation of proteins related to aerobic respiration (FDR = 0.01; LogFC = 0.08), and cellular response to stress (FDR = 0.00; LogFC = 015), and a downregulation of proteins involved in glycosaminoglycan metabolism (FDR= 0.00; LogFC = -0.32). Blood pressure and serum inflammatory and cardiometabolic markers showed no significant changes over 4 weeks ($p > 0.05$).

CONCLUSIONS

Four-week elderberry supplementation influenced the metabolic behaviour of AT and SkMus. In AT, alterations in apoptosis and extracellular matrix regulation suggest a potential impact on the characteristics of AT hyperplasia in obesity. These promising findings were coupled with an absence of significant changes in clinical markers of inflammation or cardiometabolic health. This underscores the need for longer-term human studies to confirm and further investigate the metabolic, inflammatory and structural effects of elderberry supplementation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 35 - NON COMMUNICABLE DISEASES

SOAP35_01

ELIMINATING INDUSTRIAL TRANS-FATS: A COST-EFFECTIVE STRATEGY TO SAVE LIVES AND REDUCE HEALTHCARE COSTS GLOBALLY

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BACKGROUND AND OBJECTIVES

Industrial trans-fatty acids (iTFAs) are a major dietary risk factor for ischemic heart disease (IHD) and other non-communicable diseases, causing an estimated 278,000 cardiovascular deaths annually worldwide. In response, the WHO has called for their global elimination by 2023 [1]. This narrative review synthesizes findings from cost-effectiveness analyses conducted to explore the health and economic impacts of policies to eliminate iTFAs from food supplies, focusing on diverse contexts, including low- and middle-income countries (LMICs) and high-income countries.

METHODS

This review draws on multiple modelling studies conducted across various regions to examine the health impacts, economic costs, and cost-effectiveness of eliminating iTFAs. The review includes findings from Argentina [2], Australia [3], China [4], Indonesia [5], Kenya [6], Nigeria [7], and the United Kingdom[8]. These studies estimated averted IHD events and deaths, health-adjusted life years gained, healthcare cost savings, and implementation costs over varied time horizons, with two studies also simulating health equality impact.

RESULTS

Studies consistently project that mandatory limits or bans on iTFAs can prevent a substantial number of IHD cases and deaths across diverse settings, yielding significant public health and economic benefits. In LMICs, implementing mandatory limits in foods, fats, and oils could avert hundreds of thousands of IHD cases and deaths while generating cost savings for strained healthcare systems, even when baseline iTFA intake is relatively low. High-income countries show similar trends, where eliminating iTFAs also was estimated to promote health equity by providing the greatest benefits in vulnerable populations. Across all contexts, healthcare cost savings related to IHD were consistently projected to far exceed government implementation costs, sometimes by more than tenfold. For example, China is expected to save billions of USD in healthcare costs over the first 10 years, while incurring relatively modest policy implementation expenses.

CONCLUSIONS

Modelling studies suggest that eliminating iTFAs through mandatory limits or bans is a highly cost-effective or even cost-saving strategy to reduce the global burden of cardiovascular disease and improve public health equity. The findings underscore the substantial economic returns and health benefits of such policies, particularly in LMICs and other high-burden settings, and highlight the need for accelerated policy adoption to achieve the World Health Organization's elimination goals.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP35_02

ULTRA-PROCESSED FOOD INTAKE AND RISK OF METABOLIC SYNDROME IN KOREAN ADULTS: A POOLED ANALYSIS OF THREE POPULATION-BASED PROSPECTIVE COHORTS

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BACKGROUND AND OBJECTIVES

Previous studies suggested an association between ultra-processed food (UPF) intake and impaired metabolism. However, studies specifically focusing on the risk of metabolic syndrome (MetS) using a prospective study design remain limited, particularly in Korea. Furthermore, the associations of UPF subgroups and individual items with the risk of MetS have not been thoroughly examined. Consequently, our analysis examined the associations of both combined and individual UPF intake with the risk of MetS.

METHODS

We conducted an individual-level pooled analysis of three cohorts of Korean Genome and Epidemiology Study (Ansan-Ansung, HEXA, and CAVAS; aged≥40y; n=38,155). Dietary intake was assessed at baseline using 103- and 106- item semi quantitative food frequency questionnaire and UPF intake was classified according to the NOVA classification system. Incidences of MetS were detected through follow-up interviews and health examinations. Hazard Ratios (HRs) and 95% confidence intervals (CIs) were estimated using multivariable Cox proportional hazard models, with adjustment for potential confounders.

RESULTS

Over the follow-up period of up to 18 years (290,592 person-years), a total of 4,941 incidences of MetS were identified. Every 5% higher intake of UPF (by weight ratio) was associated with an increased risk of MetS [HR (95% CI) = 1.04 (1.02, 1.06)]. Among UPF subgroups, every 5% higher intake of processed meat (e.g., ham/sausage, and fish cake/crab stick) [2.29 (1.52, 3.44)], ready-to-eat/heat mixed dishes (e.g., instant noodles, and pizza/hamburger) [1.15 (1.06, 1.24)], sugar-sweetened beverages (carbonated drinks) [1.04 (1.02, 1.07)], and ice cream [1.12 (1.03, 1.23)] were positively associated with the risk of MetS. These associations also persisted after further adjustment for sodium, potassium and calcium intakes.

CONCLUSIONS

Our findings indicate that a high consumption of UPFs, especially within the subgroups of processed meats, ready-to-eat or heat-mixed dishes, sugar-sweetened beverages, and ice cream, is associated with a increased risk of MetS among Korean adults.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP35_05

ULTRA-PROCESSED FOOD CONSUMPTION AND INCIDENCE OF STEATOTIC LIVER DISEASE IN THE NUTRINET-BRASIL COHORT STUDY

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BACKGROUND AND OBJECTIVES

Steatotic liver disease (SLD) is currently the most common cause of chronic liver disease globally, with rising prevalence in South America and worldwide over recent decades (1). Emerging evidence suggests that the consumption of ultra-processed food (UPF) may play a role in the development of SLD (2). Therefore, the present study aims to investigate the prospective association between UPF consumption and the incidence of SLD.

METHODS

NutriNet-Brasil is a web-based cohort study launched on January 26, 2020, with over 100,000 participants (3). The present study included 23,089 participants aged 18 or older, living in Brazil, who were free of SLD and had completed at least two of three previous 24-hour dietary recalls (Nova24h) - developed and validated to collect dietary intake data according to the Nova system - at baseline (4), and completed at least one follow-up health questionnaire. Participants with cancer at baseline were excluded. The UPF consumption (as % kcal/day) was averaged across the Nova-24h assessments and divided into quintiles. Incident cases included individuals who reported a medical diagnosis of SLD during follow-up. Variables for adjustment, obtained at baseline, included age (as timescale), gender, ethnicity, education, marital status, socioeconomic status, smoking, frequency of alcohol consumption, coffee intake (grams/day), physical activity, hypertension, diabetes, cardiovascular disease, and hypercholesterolemia. Additional adjustments for body mass index (BMI) and total caloric intake were performed. A sensitivity analysis was conducted excluding participants with excessive alcohol consumption (>30g/day for men, >20g/day for women). Cox proportional hazards models were used to estimate hazard ratios (HR) and 95% confidence intervals (95% CI).

RESULTS

Over 24.7 months (interquartile range, 17.8-29.8), 949 incident cases were identified. The mean dietary share of UPF represented 31.9% (±11.0) of total energy intake. Individuals in the highest quintile of UPF (>40.8% kcal/day) had a 42% (HR, 1.42, 95% CI, 1.14-1.77) higher risk of SLD compared to those in the lowest quintile (<22.5% kcal/day). This association was maintained after adjustments for BMI and total caloric intake (HR, 1.32; 95% CI, 1.06-1.64). No differences were found in the sensitivity analysis.

CONCLUSIONS

Higher UPF intake was associated with an increased risk of SLD.Global efforts to reduce UPF intake, such as public awareness campaigns, UPF taxation, marketing restrictions, and subsidies for minimally processed foods,are important measures to control and prevent SLD.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP35_07

FREQUENT CONSUMPTION OF UNHEALTHY FOODS IS ASSOCIATED WITH INCREASED BLOOD PRESSURE IN IBADAN, NIGERIA

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BACKGROUND AND OBJECTIVES

The contribution of diets to cardiovascular health is a growing public health concern. In this study, we examined the relationship between the frequent consumption of unhealthy foods and blood pressure in an urban city in south-west Nigeria.

METHODS

The study was cross-sectional, conducted in three urban Local Government Areas (LGAs) in Ibadan, Nigeria. Informed consent was obtained from 327 participants. Food frequency questionnaires were administered to obtain the frequency of food consumption. Whole foods consumed within one year were categorized into recommended/healthy foods (fruits, vegetables, low-fat dairy, whole grains, lean meat, and poultry); and non-recommended/unhealthy foods (processed meat, sugar sweetened beverages/confectionaries, and high sodium foods). A modified food score was developed following recommendations from the Dietary Approaches to Stop Hypertension (DASH) healthy eating study. Height and weight of participants were measured using a stadiometer and weighing scale respectively. Participants' blood pressures were measured in mmHg using a digital sphygmomanometer. Statistical analysis was conducted using STATA (version 15.0).

RESULTS

Participants' age ranged from 17-65 years. Hypertension prevalence ranged from 1.1% to 24%. The average systolic and diastolic blood pressures were 119.8 ± 15.2 mmHg and 80.2 ± 14.0 mmHg respectively. 33% of participants had a family history of elevated blood pressure. Consumption of non-recommended/unhealthy foods more than once a week increased systolic blood pressure by 1.35 mmHg (95% CI, 0.65mmHg – 2.04mmHg). After adjustment for age, gender, and Body Mass Index (BMI), the consumption of non-recommended foods was still significantly associated with an increase in systolic blood pressure by 0.7mmHg (95% CI, 0.05mmHg – 1.32mmHg).

CONCLUSIONS

The frequent consumption of unhealthy foods increased blood pressure of Nigerians living in Ibadan. More studies are needed to determine the relationship between whole food consumption and cardiovascular health in the country.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP35_10

EXPLORING GUT MICROBIOTA-ASSOCIATED METABOLIC PATHWAYS IN RESPONSE TO NUTRITIONALLY IMPROVED BAKERY PRODUCTS IN CHILDHOOD OVERWEIGHT/OBESITY: THE MEDKIDS STUDY

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BACKGROUND AND OBJECTIVES

Childhood obesity is a significant risk factor for metabolic and cardiovascular diseases, associated with alterations in gut microbiota composition and its metabolic activity. Cereal-based products, widely consumed by children, frequently have inadequate nutritional profiles. This study aimed to evaluate the effects of nutritionally improved versus conventional cereal-based products on the gut microbiota-related metabolic pathways in children with overweight/obesity, in the context of Mediterranean diet.

METHODS

A randomized, crossover clinical trial was conducted with two 8-week intervention periods, separated by a 5-week washout phase. Children aged 6–12 years with overweight/obesity consumed either nutritionally improved or conventional bakery products, maintaining their habitual diet. The improved products were higher in fiber (39-49%), lower in saturated fats (43-73%) and sugars (39-200%), and included sourdough culture. Fecal samples were collected before and after each period. Bacterial functional profiles were predicted using PICRUSt2, focusing on glycolysis, fatty acid β-oxidation, pyruvate fermentation to acetate and lactate, and of nitrate reduction pathways.

RESULTS

Twenty-seven participants (mean age:11.25 ± 1.38) provided fecal samples at all four visits. There were no significant changes in the analyzed metabolic pathways. In the intervention group, glycolysis activity increased (29137.37 to 30329.38), as did pyruvate fermentation to acetate and lactate (31768.25 to 32070.86), while fatty acid β-oxidation decreased (3337.82 to 3084.35). In the control group, glycolysis activity decreased (28753.55 to 28315.50), fatty acid β-oxidation increased (1798.49 to 2697.92) whereas pyruvate fermentation to acetate and lactate decreased (28675.84 to 27648.16). However, nitrate reduction activity significantly increased in the control group (36.06 to 45.93) (p=0.029).

CONCLUSIONS

The inclusion of cereal-based products with improved nutritional profiles led to non-significant changes in the gut microbiota-associated metabolic pathways in children with overweight/obesity.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP35_12

LOWER GLYCEMIC INDEX INTAKE AFTER WEB-BASED NUTRITION EDUCATION AMONG ADULTS WITH TYPE 2 DIABETES

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BACKGROUND AND OBJECTIVES

Rigorous evidence is needed to support uptake of Diabetes Canada's evidence-based recommendations to include low glycemic index (GI) foods in daily meal planning as an effective dietary self-care strategy for people with type 2 diabetes (T2D).

This objective of this study is to evaluate the effectiveness of a 12-week lifestyle intervention with web-based GI-targeted nutrition education on dietary intake and GI-related knowledge among adults with T2D.

METHODS

Participants (N=67) were randomized to a control group that received standard printed copies of Canada's Food Guide and Diabetes Canada's GI resources or an intervention group that received those same materials, plus a customized online platform with six self-directed learning modules and supplementary print materials. Each module consisted of a customized video, links to reliable websites, chat rooms, and quizzes. Evidence-based GI concept information included GI values of foods and advice for low-GI shopping, recipes, and cooking tips by a Registered Dietitian. Support through email, text messaging, phone calls, or postal mail to reinforce participants' learning were also available. The primary outcome, daily dietary GI intake, was assessed using 3-day food records. Additional measures including GI knowledge and self-efficacy, glycated hemoglobin A1c, lipids, systolic blood pressure, body mass index, waist circumference, and computer proficiency, were assessed at baseline and at three months post-intervention.

RESULTS

Participants were 64% men; mean (standard deviation [SD]) age 69.5 (9.3) years, with mean diabetes duration of 19.0 (13.7) years, BMI 30.1 (5.7) kg/m2, and A1c 7.1 (1.2)% at baseline. Mean daily GI was similar between intervention (48.60, SD 7.79) and control (49.06, SD 7.94) at baseline. The intervention group had a reduction in GI units of 2.79 (7.77), while the control group increased by 0.76 (6.48). The between group difference in change was -3.77 (95%CI: -6.95, -0.58; p=0.02; effect size d=0.53). Statistically significant improvements in GI-related knowledge and self-efficacy were observed ($p<0.01$) for the intervention with moderate to large effect sizes (i.e., d=0.56 to d=0.92).

CONCLUSIONS

A web-based education program modestly improved GI dietary intakeover 3 months in this sample of adults with type 2 diabetes. Findings from this study provide evidence to support the translation of the GI concept to adults with T2D using a bundle of patient preferred interventions to effect change in GI-related dietary behaviours and intake.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP35_14

CHANGES IN SELF-REPORTED CARDIOVASCULAR RISK FACTORS IN URUGUAYAN ADULTS: A PRE- AND POST-PANDEMIC COMPARISON

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BACKGROUND AND OBJECTIVES

The COVID-19 pandemic altered lifestyles worldwide, impacting cardiovascular disease (CVD) risk factors. The study aimed to determine changes in CVD self-reported risk factors comparing data from the pre-pandemic period to data collected at the time of the survey.

METHODS

A cross-sectional, online study was conducted, including 609 adults aged 18 and over. We selected a convenience sample by disseminating the link to the survey via emails, official university websites, and social networks.

All questions included response options of "Before the pandemic" and "Survey time" to evaluate changes over the specified period.

The outcomes were the incidence on reporting hypertension, diabetes mellitus (DM), hypercholesterolemia, current smoking, gain of body mass index (BMI) higher than one point and sedentarism.

RESULTS

RESULTS indicated a high prevalence of CVD risk factors, with 18.22% reporting hypertension, 20.19% dyslipidemia, 7.55% DM, and 72.13% sedentary behavior. Age, marital status, education, employment, and pre-pandemic obesity were significantly associated with increased risk. The <30 age group showed the highest BMI gain (42.24%), while the 45-60 age group had the highest dyslipidemia and DM incidence. Non-married individuals exhibited higher rates of DM, smoking, and sedentarism. Lower education levels were associated with increased BMI gain and smoking.

Multivariate logistic regression identified significant predictors of CVD risk. Obesity before the pandemic was strongly associated with hypertension (AOR = 5.83), DM (AOR = 5.62), and dyslipidemia (AOR = 2.82). Depression was significantly linked to increased DM (AOR = 7.66), dyslipidemia (AOR = 8.21), and smoking (AOR = 6.25). Sedentarism was significantly higher among individuals with non-full-time employment.

CONCLUSIONS

These RESULTS highlight the indirect health consequences of prolonged lockdowns, beyond the direct effects of COVID-19 itself.

The study found a rise in BMI, sedentarism, hypertension, diabetes mellitus, and dyslipidemia, particularly among individuals with lower education levels, those unemployed or not working full-time, and those experiencing depression.

Given the observed increase in cardiovascular risk factors, public health efforts should focus on mitigating the long-term health consequences of pandemic-related lifestyle changes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP35_16

CHANGES IN HEALTH AND NUTRITIONAL STATUS AMONG ADULTS BEFORE AND AFTER THE LOCKDOWN

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BACKGROUND AND OBJECTIVES

This study examined health and nutrition vulnerabilities during COVID-19. Findings will inform future pandemic strategies and identify key determinants of nutritional resilience.

METHODS

This study is a longitudinal cohort study with two points, before and after the pandemic. Anthropometric, clinical and health, dietary, and socioeconomic data were compared and regression analysis was done to assess associations between changes in behavioral risk factors, in dietary intake, and cardiometabolic risk factors.

RESULTS

Prevalence of overweight and obesity, raised blood pressure, and high fasting blood glucose among adults and elderly increased in 2022. A remarkable percentage of adults who had normal nutritional status based on BMI, became overweight or obese after the follow-up. The percentage of former smokers and former alcohol drinkers increased during the COVID-19 pandemic indicating that some survey-respondents initiated smoking or drinking alcoholic beverages and stopped during the survey in 2022, while binge drinking or the excessive drinking of alcohol slightly increased. Physical activity status remained unchanged. In terms of dietary intake, a high percentage of adults and elderly in 2019 failed to meet the daily Recommended Energy Intake (REI), and majority were still not meeting the REI in 2022.

CONCLUSIONS

COVID-19 pandemic has derailed the progress towards attainment of the global targets for noncommunicable diseases for 2025, as evidenced by the increasing prevalence of biological NCD risk factors. This follow-up study is the first attempt to trace and collect data from sub-sample of participants of a cross-sectional nationwide survey.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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Precision And Clinical Nutrition

SOAP 11 - PRECISION AND CLINICAL NUTRITION

SOAP11_04

PREDICTION OF GESTATIONAL DIABETES MELLITUS USING CONTINUOUS GLUCOSE MONITORING METRICS

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BACKGROUND AND OBJECTIVES

Advances in continuous glucose monitoring (CGM) offer potential for early hyperglycemia detection, yet research in Asian pregnant women is scarce. We evaluated CGM metrics for predicting gestational diabetes (GDM) in this population.

METHODS

Data were from a prospective cohort of 167 participants in Singapore with ≥3 days of CGM data (18–24 weeks gestation) and GDM diagnosis via oral glucose tolerance tests (24–28 weeks gestation). Predictive performance of the CGM metrics was assessed using the area under the receiver operating characteristic (AUROC) curve, sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) in logistic regressions (20 repetitions of 5-fold cross-validation; optimal cut-points determined using Youden's index).

RESULTS

There were 30 diagnosed GDM cases (prevalence of 18%) in this study. According to the AUROC, the best-performing CGM metric was %time above 140 mg/dl (%TA140) [AUROC (95% CI): 0.86 (0.78, 0.95); cut-point: 1.23%; sensitivity: 0.80; specificity: 0.85; PPV: 0.49; NPV: 0.96]. The second and third best-performing metrics were J-index [AUROC (95% CI): 0.84 (0.75, 0.94); cut-point: 11.05; sensitivity: 0.77; specificity: 0.88; PPV: 0.55; NPV: 0.95] and standard deviation (SD) [AUROC (95% CI): 0.83 (0.75, 0.91); cut-point: 1.12 mmol/L; sensitivity: 0.77; specificity: 0.80; PPV: 0.42; NPV: 0.95]. The predictive performance of these three metrics was stronger in lean women (body mass index (BMI) <23 kg/m2; n=89) (AUROC for %TA140, J-index, SD: 0.88, 0.85, 0.86) than in women with overweight (BMI >=23 kg/m2; n=78) (AUROC for %TA140, J-index, SD: 0.74, 0.73, 0.73). AUROC for %TA140 and J-index remain >0.80 in analyses restricted to ethnically Chinese participants (n=142), whereas SD emerged as the best-performing metric for non-Chinese participants (AUROC: 0.85), albeit based on small number (n=25). In the overall population, adding CGM metrics individually to a baseline model including maternal age, BMI, job status, and ethnicity improved the AUROC from 0.62 to 0.89 (%TA140), 0.86 (J-index), and 0.86 (SD). Including all the metrics in the model simultaneously did not further improve the AUROC (0.88).

CONCLUSIONS

CGM-derived glycemic metrics, particularly %TA140, J-index, and SD, show promise as early predictors of GDM, highlighting the potential of CGM for earlier detection and management of adverse glycemic profiles during pregnancy. The observed variations in predictive performance by weight status and ethnicity warrant replication in larger, diverse populations.

CONFLICTS OF INTERESTS

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SOAP11_05

REAL-WORLD CONSUMER OUTCOMES IN INDIVIDUALS SUBSCRIBED TO A PERSONALIZED NUTRITION MEAL DELIVERY PROGRAM IN FRANCE

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BACKGROUND AND OBJECTIVES

Weight loss meal delivery programs are a solution offered to individuals looking for weight loss and convenience. Evidence-based personalized nutrition, using individual preferences and biological factors, provides a means to improve individual outcomes through informing consumers and recommending tailored dietary plans. Beyond clinical trials, real-world of evaluation of commercial offers using personalized nutrition is scant. Our objective was to assess the effectiveness of the first commercial offer of a weight loss meal delivery program using personalized nutrition recommendations in cardiometabolic health released in France in 2021.

METHODS

We performed retrospective analyses on real-world data from 2021 and 2022 in a subset (n = 2034) of clients with body weight data that were subscribed to a standard (n = 554) or personalized (n = 1480) weight loss meal delivery program throughout France. After centering and scaling baseline body weights, we used Linear Mixed Models to evaluate body weight trajectories over time between personalized and standard programs for men and women. Linear Mixed Models were also used to evaluate time to reach 5% body weight lost. Cox proportional hazards were used to assess the probability of achieving 5% weight loss between programs across the duration body weight data available.

RESULTS

Subscription to the personalized program was associated with significantly more weight loss over a period of 120 days compared to subscription to the standard program (significant time*program interaction, $P<0.05$ for men, $P<0.001$ for women). Complementing these findings, the average time to reach 5% body weight loss was significantly faster in the personalized group vs standard group (43.7 ± 3.3 vs 53.4 ± 3.0 days, respectively, $P < 0.05$). In both programs, weight loss measurements were available for 2 months on average (personalized: 62.2 ± 2.3 days, standard: 60.8 ± 1.4 days). Across all longitudinal body weight data available, individuals in the personalized program were 40% more likely to reach 5% weight loss compared to standard subscribers (HR: 1.40, CI: 1.03-1.91, $p < 0.05$).

CONCLUSIONS

Personalized nutrition recommendations are associated with superior short-term weight loss outcomes, which provides promise for these personalized nutrition algorithms in real-world populations and cardiometabolic disease prevention. Future analyses will focus on individual-reported outcomes, such as quality of life measurements and factors related to acceptability, which are equally important outcomes, similar to long-term weight-loss sustainability

CONFLICTS OF INTERESTS

KC is a scientific collaborator of Integrative PhenomicsLG and VG are employees of AliiveTS and NF are employees of Integrative Phenomics

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SOAP11_07

TAILORED FOOD AS MEDICINE PROGRAM AS AN EFFECTIVE APPROACH TO IMPROVE CLINICAL OUTCOMES AMONG LOWER RESOURCE ADULTS EXPERIENCING FOOD INSECURITY AND HYPERTENSION

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BACKGROUND AND OBJECTIVES

Food is medicine programs have shown to be effective at reducing blood pressure among adults experiencing food insecurity and have gained increased attention as a way to address social determinants of health. However, many of the studies have focused on comparing food is medicine programs to either standard of care or to another program offering while not considering the user experience, preferences, and resource constraints of the participant. Our study developed a screening decision tool which allocates participants based on preferences and resource constraints and allows for the user to be part of the decision-making process. The aims of this study are to: 1) Examine the use of a screening decision tool for allocation into food is medicine programs; 2) Determine effect of the FIM program on primary outcomes of blood pressure (systolic and diastolic); and 3) Determine effect of FIM programs on secondary outcomes of quality of life, dietary intake, nutrition security, and food security.

METHODS

Two large hospital systems in Kentucky, one rural and one urban, screened patients for food insecurity over 45-days. Patients who met eligibility criteria of being food insecure, ages 18-64, and having a diagnosis of hypertension were referred to the team for informed consent and baseline survey. After consent a further screening decision tool was given to patients related to preferences and resource constraints. A total of =N159 completed enrollment; N= 115 allocated into grocery Rx programs and N=43 allocated to medically tailored meals and N=1 allocated to grocery Rx online.

RESULTS

Among those who participated in the medically tailored meal program there was a reduction in systolic blood pressure (-9.82mmHg) and diastolic (-6.82mmHg) from pre and post intervention. Among those who participated in the grocery prescription program there was a reduction in systolic blood pressure (-6.72mmHg) and diastolic (-2.34mmHg) from pre and post intervention. Secondary outcomes indicated an overall reduction in food security, increased intake of 1 serving size of fruits and vegetables combined, and increase in quality of life.

CONCLUSIONS

Tailoring a food is medicine program to user preferences and constraints is a preferred method to improve clinical outcomes among food insecure adults. Clinical and community partners conducting food is medicine programs need to tailor efforts based on user preferences and needs for clinically meaningful RESULTS.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP11_08

NAVIGATING DIETARY ADVICE AND ILEOSTOMY: INSIGHTS FROM PATIENTS AND HEALTHCARE PROFESSIONALS

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BACKGROUND AND OBJECTIVES

Ileostomy surgery is a life-changing operation which impacts approximately 64 000 people in the UK (1) and necessitates significant dietary change in the first 6-8 weeks post-surgery (2). Dietary restrictions are often sustained for many months, or even years after an ileostomy (3, 4). Challenges with accessibility and inconsistency of dietary support often contribute to this (5). Consequently, this study aimed to understand the provision and implementation of dietary advice for ileostomates.

METHODS

A qualitative study using semi-structured interviews. Ileostomates (>8 weeks post-surgery) and healthcare professionals (HCPs) (stoma nurses and dietitians) were eligible to take part. People and Public Involvement informed the interview structure; questions covered experiences of pre- and post-operative (short and long-term) advice. Interviews were audio/ video recorded, and transcribed verbatim prior to thematic analysis (6).

RESULTS

For the ileostomate group (n=13), inflammatory bowel disease was the most common reason for surgery (n = 8) and post-operative duration ranged from 4 months – 30 years. HCP participants (n=12) were predominantly dietitians (n=7, 58%) and / or based in an acute hospital setting (n=9, 75%). From a pre-operative perspective, emergent themes demonstrated the need for increased support at this timepoint. This was emphasised by both groups and echoed post-operatively where follow-up was lacking. HPCs identified staffing shortage and limited finances as major barriers to improving services and patient care. Dietary advice emphasises “foods to avoid,” which is reflected in the dietary restrictions implemented by ileostomates in the weeks, months, and years post-surgery. During the first 6-8 weeks post-operative, reassurance from HCPs and support from family were crucial for ileostomates in adapting their diet. Following the early post-operative period, where external support was absent, peer support (from other ileostomates) and self-discovery were imperative in coping with dietary management of their stoma. Conflicting advice regarding symptom management – particularly management of high output stoma – was a major barrier to dietary reintroduction and a source of distress for ileostomates and HCPs.

CONCLUSIONS

This study provides a comprehensive understanding of the dietary support available to ileostomates from a dual perspective and highlights a need for improvements in the services offered. These findings will contribute to evidence-based practices for HCPs and offer practical solutions to optimise person-centred care.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP11_13

ADULTS WITH COELIAC DISEASE LIVING GLUTEN FREE: INFLUENTIAL SOURCES OF DIETARY INFORMATION

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BACKGROUND AND OBJECTIVES

Coeliac disease (CD) affects 1% of the global population [1]. Gluten Free (GF) diet is the only treatment for people living with CD, widely recognised to be challenging, especially when eating out of the home environment [2]. Access to healthcare professionals (HCPS) is limited and alternative sources of information are used to enable people to live GF [3].

Study Aim: Determine key sources of dietary information beyond healthcare professionals.

METHODS

A survey was designed to collect patient demographics and key GF dietary information sources, the online survey link (Jisc) was distributed by email and social media during Summer 2024. SPSS software was used for data analysis.

RESULTS

Data from 675 adults with CD completed the online survey (82% female; 95% white; 98% living in the UK). The majority (88%) report symptoms on gluten ingestion, 84% were diagnosed for >1year and 51% were current members of coeliac patient support charity [5]. The majority (84%) reported following a strict gluten-free diet.

Sources of useful information and misinformation on gluten free diet.

Information Source	Very/ Extremely useful	Received/ Accessed missinformation
Coeliac UK charity	74%	4%
Person with CD	61%	20%
Cookbooks	55%	7%
Internet	52%	32%
Socia media	48%	31%
Healthcare professionals		
Dietitian	51%	9%
Gastroenterologist	35%	8%
General Doctor	15%	18%

Half of participants (n=356) used social media at least 1/week, of these 64% found it to be very/ extremely useful for providing information on new GF foods, 61% for GF recipes and 59% for travelling or eating out GF.

CONCLUSIONS

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The internet and social media is widely used by adults with CD to live well GF, however there is a high proportion of misinformation. HCPs need to continue creating high quality digital content to support instantly accessible dietary information for living gluten-free.

CONFLICTS OF INTERESTS

KK is employed by a company that manufactures gluten free products.

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SOAP11_14

IMPACT OF MEDITERRANEAN DIET ON PROCOAGULANT ACTIVITY OF ENDOTHELIAL MICROPARTICLES

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BACKGROUND AND OBJECTIVES

Microparticles play a role in vascular injury observed in cardiovascular disease. The Mediterranean diet (MedDiet) pattern is increasingly considered due to its cardioprotective effects because of the bioactive compounds contained in of this pattern (e.g., olive oil or its polyphenols). The aim was to investigate the impact of an intensive weight loss intervention with an energy-reduced Mediterranean diet (eMedDiet) and physical activity promotion in preventing cardiovascular disease in adults with metabolic syndrome (MetS) on microparticle procoagulant properties.

METHODS

One hundred thirty-two older adults with overweight/obesity and MetS (49% females, mean age 67.8 ± 4.2 years) were studied in the framework of the PREDIMED-Plus study. At baseline and after 1-year intervention, microparticle procoagulant activity was determined using ZymuphenTM MP-ACTIVITY according to the manufacturer's protocol. Thrombin activity was measured by absorbance at 405 nm on a spectrophotometer following cleavage of a specific substrate. Plasma microparticle concentration was expressed in nM of phosphatidylserine (PS) equivalent.

RESULTS

After 12-months, microparticle concentration (nM PS) increased from 15.7 ± 1.0 to 24.7 ± 2.5 ($p < 0.001$) and from 17.1 ± 1.1 to 29.5 ± 1.5 ($p < 0.001$) in eMedDiet and control group, respectively. The difference between changes was lower in the eMedDiet group (-4.8 ± 2.2) with a significant P-interaction (Pint=0.042).

CONCLUSIONS

Increases in eMedDiet microparticle release and its procoagulant activity were significantly lower than those observed in the control group after 12 months of intervention.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP 17 - PRECISION AND CLINICAL NUTRITION

SOAP17_02

EFFECT OF A LOW CHO/HIGH PROTEIN BREAKFAST COMPARED TO A CONTROL BREAKFAST ON GLYCEMIC RESPONSE IN PREGNANT WOMEN WITH GESTATIONAL DIABETES: A RANDOMIZED CROSSOVER STUDY

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BACKGROUND AND OBJECTIVES

Gestational diabetes mellitus (GD) is a glucose intolerance leading to hyperglycemia that is diagnosed during pregnancy (1). The amount and type of carbohydrate (CHO) ingested affects glycemia; the current recommended amount of CHO in GD is 175 g, or ~35% of a 2000 kcal diet (2). There is no evidence on how CHO intake should be distributed throughout the day. One of the meals with the highest postprandial hyperglycemia is breakfast, due to more pronounced insulin resistance at this time of day. Whether a low CHO but high protein intake at breakfast is beneficial has not yet been studied.

Objective: to compare the effects of a breakfast low in CHO and high in protein (10% of daily CHO and 30% of daily protein) with a control breakfast (25% of daily CHO and 15% of daily protein) on postprandial glycemia in women with GD.

METHODS

Randomized crossover clinical trial with 7 women diagnosed with GD with normal nutritional status, overweight or obese and without pharmacological treatment for GD. Each participant was her own control, receiving two different types of breakfasts: a low CHO/high protein breakfast (10% of the day's CHO and 30% of the day's protein) and a control breakfast (25% of the day's CHO and 15% of the day's protein). Each breakfast was consumed in two independent but continuous 3-day periods, with a 1-day washout period in between. Participants remained on continuous glucose monitoring throughout the trial and performed capillary glycemia measurement at fasting and at 30, 60, and 120 min after breakfast intake. Data were analyzed by Paired T test and repeated measures ANOVA test.

RESULTS

Participants were on average 37 +/-3.8 years old and had a BMI of 27.7 +/-5.4 kg/m². The control breakfast caused statistically higher glycemia at 30 and 60 minutes ($p<0.05$). None of the breakfasts exceeded the glycemic range of 63 -140 mg/Dl recommended for pregnant women with GD. The low CHO/high protein breakfast showed a statistically lower area under the incremental glycemic curve than the control breakfast ($p<0.05$).

CONCLUSIONS

A low CHO/high protein breakfast significantly reduced glycemia at 30 and 60 minutes. These RESULTS suggest that adjusting the macronutrient distribution at breakfast could be an effective strategy to improve glycemic control in these women, especially in the prevention of postprandial hyperglycemia.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP17_03

IMPROVING NUTRITIONAL STATUS AMONG HIV-POSITIVE CAMBODIAN CHILDREN: IMPACT OF A FISH-BASED READY-TO-USE THERAPEUTIC FOOD ON WEIGHT GAIN AND MICRONUTRIENT AND POLYUNSATURATED FATTY ACID STATUS

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BACKGROUND AND OBJECTIVES

Severe acute malnutrition (SAM) in children with human immunodeficiency (HIV) is common, due to higher requirements and reduced intakes, but data on the impact of ready-to-use therapeutic foods (RUTFs) on anthropometry and nutrient status are scarce. We aimed to assess effectiveness of RUTFs in the treatment of SAM among 0.5-18-year-old HIV-positive Cambodian children.

METHODS

The present study is a secondary analysis using a sub-sample (35 HIV-positive children) from a larger trial on the impact on nutritional status of a locally produced fish-based RUTF (NumTrey) or standard milk-based RUFT (BP-100TM) consumed over an 8-week period. During a single-blinded randomised intervention, nutritional status and health markers were assessed through anthropometric assessment and serum biomarkers for inflammation and micronutrient biomarkers. Whole-blood fatty acids were analysed using dried blood spots. The trial was conducted at the National Paediatric Hospital, Phnom Penh, Cambodia.

RESULTS

Mean age of the children was 11.4 years, who received on average 56 days of treatment. *In the intention-to-treat analysis the estimated weight gain with BP-100T*M *was 4.78 g/kg/day;* 95% CI (-6.9, 16.4), while for *NumTrey, the weight gain was 3.71 g/kg/day*; 95% *CI* (-13.0, 20.4) (*P<0.05)*. Haemoglobin (*p*=0.029), CRP (*p*= 0.047), and AGP (*p*=0.002) concentrations were significantly lower at discharge than at admission. There was no statistical change over the treatment period in ferritin, sTfR, body iron, or RBP concentrations, although the prevalence of iron and vitamin A deficiency declined from 3% to 0% and from 6% to 4% respectively (P<0.05). On the contrary, statistically significant increases in marginal vitamin A deficiency and anaemia prevalence were found (P<0.05). Whole-blood Mead acid was significantly reduced to 0.06±0.03 FA% (*p*=0.001). Total n-6 PUFA's remained the same, while a significant reduction in DPA (22:5n-6) was found (from 0.3 FA% to 0.2 FA%, *p* = 0.010). A minor non-significant increase in total n-3 PUFA was found, while non-statistically significant reduction was found for DPA n-6/DHA, n-6/n-3 PUFA ration and EPA+DHA.

CONCLUSIONS

This sub-sample analysis show positive effects on weight gain for both RUTFs during SAM treatment of HIV-positive children, but the limited impact on micronutrients and fatty acids status requires further investigation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP17_05

EVIDENCE-BASED GUIDELINES FOR THE DIETARY MANAGEMENT OF CHRONIC CONSTIPATION IN ADULTS: SYSTEMATIC REVIEWS OF RANDOMISED CONTROLLED TRIALS, GRADE APPROACH AND DELPHI EXPERT CONSENSUS

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BACKGROUND AND OBJECTIVES

The management of chronic constipation remains challenging, with high rates of treatment dissatisfaction. Current clinical guidelines offer limited dietary recommendations, and there is a lack of evidence-based guidelines for the dietary management of chronic constipation. The aim of this project was to develop the first comprehensive evidence-based dietary guidelines for the management of chronic constipation in adults.

METHODS

The scope of the guidelines included dietary supplements, foods, drinks, and whole diets in adults with chronic constipation. Four systematic reviews and meta-analyses were performed to identify eligible randomised controlled trials (RCTs) (1-4). The findings generated from the meta-analysis of RCTs were then used to develop guideline statements using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach and a Delphi consensus survey among a multi-disciplinary expert steering committee. Recommendation statements were produced for treatment response, stool output, gut symptoms, adverse events, and quality of life, and only based on the findings where ≥2 RCTs contributed to the meta-analysis. The “strength of recommendation” was assessed using the GRADE approach. Consensus voting amongst the expert steering committee was performed using a modified Delphi survey approach.

RESULTS

The four systematic reviews included a total of 75 RCTs (1-4). Fifty-nine dietary recommendation statements were generated and accepted through the Delphi survey. In terms of dietary supplements, 15 recommendation statements related to fibre supplements, 20 related to probiotics, 2 to synbiotics, 5 to magnesium oxide, 2 to senna, and 3 to kiwifruit supplements. In terms of foods, 3 recommendation statements related to kiwifruits, 2 to prunes, and 2 to rye bread. In terms of drinks, 5 recommendation statements related to high mineral-containing water. No recommendations were made for whole diet approaches due to lack of evidence. Ten statements had a very low level of evidence, 41 had low level of evidence, and 8 had moderate evidence. Twenty-seven statements were strong recommendations and 32 were qualified recommendations.

CONCLUSIONS

These are the first comprehensive evidence-based dietary guidelines for the management of constipation based upon robust systematic review and GRADE processes. Recommendations were made for dietary supplements, foods and drinks that have never been previously included in clinical guidelines, and can now be rapidly implemented into clinical practice.

CONFLICTS OF INTERESTS
AF and SMS report no conflicts of interest.AVDS has been supported by a doctoral fellowship from the Almond Board of California. ED has received an education grant from Alpro, research funding from the Almond Board of California, the International Nut and Dried Fruit Council and Nestec Ltd, and has served as a consultant for

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SOAP17_06

EATING HABITS AND SPECIFIC FOODS AND THEIR ASSOCIATION WITH GASTROINTESTINAL SYMPTOMS IN PATIENTS WITH FUNCTIONAL DYSPEPSIA AND IRRITABLE BOWEL SYNDROME

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BACKGROUND AND OBJECTIVES

Among patients with functional bowel disorders (FBD), food intake is a known symptom trigger and dietary modifications are encouraged as a first line treatment. Here, we aimed to explore if certain eating habits are associated with gastrointestinal (GI) symptoms, and which specific foods are identified as triggers of GI symptoms among participants with functional dyspepsia (FD), irritable bowel syndrome (IBS), and a control group without bowel symptoms.

METHODS

An online survey was conducted including n=825 Swedish women and men aged 18-70 years who had at least one bowel symptom at the frequency threshold (Rome IV criteria) for defining an FBD. An age- and sex-matched control group without bowel symptoms was recruited from the general Swedish population (n=1738). The survey included questions on demographics, dietary preferences, eating speed, liquid intake during meals and meal frequency per day. An in-house created food frequency questionnaire that assesses intakes of 38 commonly consumed food items was used. For each food, participants had to answer whether they considered the specific food to be a trigger for GI symptoms. IBS symptom severity was assessed with the IBS severity scoring system (IBS-SSS).

RESULTS

In total, n=159 fulfilled Rome IV criteria for FD and n=136 for IBS, hereafter referred to as patients. Adhering to any special diet was more common in patients compared to controls ($p<0.001$). The controls reported drinking less liquids during mealtime compared to patients with FD ($p=0.027$). Among patients, neither eating speed, liquid intake during meals, nor the number of eating occasions per day was significantly associated with IBS symptom severity. Foods that were least commonly reported to cause GI symptoms in patients included hard bread, fish, berries, and seeds. The most frequently reported food triggers include pizza, crisps, ice cream, white bread, and dairy. Having overlapping IBS and FD increased the prevalence of foods that were considered to cause symptoms.

CONCLUSIONS

In this cross-sectional study, no associations with eating patterns and GI symptoms were noted. In patients with FD and IBS, food items associated with a healthy Nordic diet were less commonly reported to cause GI symptoms, whereas junk foods were more commonly reported to cause GI symptoms. Promoting healthy food choices seems compatible with dietary treatment of patients with FD and IBS.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP17_07

HOW DOES THE USE OF BIOELECTRICAL IMPEDANCE SPECTROSCOPY VS CALF-CIRCUMFERENCE IMPACT THE MALNUTRITION DIAGNOSIS ACCORDING TO THE GLOBAL LEADERSHIP INITIATIVE ON MALNUTRITION (GLIM) IN PATIENTS WITH CHRONIC KIDNEY DISEASE?

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BACKGROUND AND OBJECTIVES

Malnutrition is considerably prevalent in chronic kidney disease (CKD), with higher prevalence in later stages of CKD. The Global Leadership Initiative on Malnutrition (GLIM) is a framework designed to diagnose malnutrition in adults. Since its release in 2019, the framework has gained broad acceptance both in research and clinical practice. Studies that address how the five criteria of GLIM should be applied in different populations, with special attention to the phenotypic criterion ‘reduced muscle mass’, are needed. The aim was to investigate how different ways of operationalizing and measuring the phenotypic criterion reduced muscle mass influence the GLIM diagnosis in patients with CKD treated with hemodialysis.

METHODS

This is a cross-sectional study where recruitment of patients with CKD was conducted at a university hospital in Sweden during August-September of 2024. Patients who were ≥18 years of age, with hemodialysis treatment >3 months and who were able to understand and give written consent were included. Collection of data is ongoing and will be available in the spring of 2025. Data are collected from medical records and from the Swedish Renal Registry. All five GLIM criteria will be assessed for all participants: weight loss, low BMI, reduced muscle mass (phenotypic criteria), as well as reduced food intake/assimilation and inflammation/disease burden (etiologic criteria). Presence of at least one phenotypic and at least one etiologic criterion will set the diagnosis. Muscle mass will be assessed by bioelectrical impedance spectroscopy (BIS) and calf circumference.

RESULTS

In total, 97 patients were screened for eligibility and 69 of 74 eligible patients (43 men and 26 women, mean age 66.6 ±14.6 years) gave their written consent and were included. Mean time on dialysis was 48.9 ± 48.1 months (min 3.7, max 198.8). RESULTS on how the prevalence of malnutrition according to GLIM differs per muscle assessment method will be presented at the congress.

CONCLUSIONS

The findings will contribute to increased understanding on how the phenotypic criterion reduced muscle mass should be applied when using GLIM in patients with CKD treated with hemodialysis.

CONFLICTS OF INTERESTS

H. Jager-Wittenaar was co-developer of the PG-SGA-based Pt-Global web tool.

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SOAP17_08

GINSENOSIDE RB1 DECREASES TOTAL CHOLESTEROL AND APOLIPOPROTEIN A IN PATIENTS WITH HYPERCHOLESTEROLEMIA: A RANDOMIZED DOUBLE-BLIND PLACEBO CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Ginsenoside Rb1 is one of the major bioactive ingredients of ginseng and exhibits a variety of bioactivities. However, the lipid-lowering efficacy of ginsenoside Rb1 in human remains controversial. This study aimed to investigate the effect of ginsenoside Rb1 on lipid profiles in patients with hypercholesterolemia by using a randomized double-blind placebo controlled trial (RCT).

METHODS

A total of 124 patients diagnosed with hypercholesterolemia (total cholesterol (TC)≥5.2 mmol/L) were recruited in the 8-week RCT (Registration number: ChiCTR2400086584). Participants were randomly assigned to the placebo (starch and cellulose) and ginsenoside Rb1 (oral ingestion of 200 mg/d) group (n=62 each) with maintaining double blind to both researchers and participants. The primary outcome measure TC and the secondary outcome measures including triglycerides (TG), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), apolipoprotein A (APOA), apolipoprotein B (APOB), fasting blood glucose (FBG), fasting insulin (FINS), and liver and kidney function indicators in blood were determined at baseline, 4w and 8w.

RESULTS

At baseline and 4 w, there was no significant difference (p>0.05) in any lipid or glucose metabolism parameters between the two groups. At 8 w, TC was significantly reduced by 0.24 mmol/L (95% CI: -0.44 to -0.04; p=0.019) and APOA decreased by 0.06 mmol/L (95% CI: -0.11 to -0.01; p=0.023) in the ginsenoside Rb1 group. No difference (p>0.05) was found in TG, HDL-C, LDL-C, APOB, FBG or FINS between the two groups. In addition, no liver or kidney damage was observed during the trial period.

CONCLUSIONS

Ginsenoside Rb1 supplementation for 8 w reduces TC and APOA in patients with hypercholesterolemia, suggesting its efficacy in lowering cholesterol.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP17_12

CROSS-SECTIONAL ASSOCIATIONS BETWEEN SATURATED FAT INTAKES FROM MEAT, DAIRY AND DESSERTS AND BIOMARKERS AND METABOLITES OF CARDIOMETABOLIC RISK IN THE UK BIOBANK COHORT STUDY

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BACKGROUND AND OBJECTIVES

Red and processed meats are significant sources of saturated fatty acid (SFA), which compared with other food sources of SFA, can have potentially negative impacts on cardiometabolic (CM) health. This study aimed to classify participants in the UK Biobank based on their consumption of three primary dietary sources of SFA – dairy, red/processed meats, and desserts – and examine cross-sectional associations with biomarkers and metabolites of CM risk.

METHODS

Detailed dietary data from at least two 24-h online dietary assessments was used for a sample of n=107,758 participants. Participants were classified using their average daily consumption (g/day) of food groups as mostly consuming 1) Dairy (n=10,516), 2) Red/processed meat (n=26,438), 3) Desserts (n=46,425) or 4) combinations of those (n=24,379). CM related biomarkers, such as LDL-C, HDL-C, triglycerides (TAG), apolipoprotein A (ApoA), apolipoprotein B (ApoB), lipoprotein(a), glucose, HbA1c, C-reactive protein (CRP), as well as metabolomic analyses were determined using fasting blood samples. Multivariable linear regressions were used to estimate geometric means (95% CIs) of biomarkers according to SFA group, adjusted for demographic, lifestyle, and dietary confounders.

RESULTS

Participants in the red/processed meat group showed significantly higher levels of LDL-C (3.64 mmol/L, 95%CI 3.63 to 3.65), compared with the dairy (3.56 mmol/L, 95%CI 3.55 to 3.58) or the desserts group (3.62 mmol/L, 95%CI 3.62 to 3.63). Similar patterns were observed in other biomarkers, with significant lower levels of HDL-C and ApoA, and significantly higher levels of TAG, ApoB and CRP in the red/processed meat group compared with the dairy group. People in the desserts group also showed significantly positive associations with TAG and CRP compared with the dairy group.

CONCLUSIONS

Intake of different food sources that contribute the most to dietary SFA show small albeit significantly different levels of several cardiometabolic biomarkers. Whilst people consuming more dairy foods show favorable or neutral associations with HDL-C and ApoA, people consuming more red/processed meat and desserts show significantly higher levels of lipid, glycemic, and inflammatory markers which reflect a more adverse CM profile. These findings emphasize the importance of targeting specific SFA sources in dietary recommendations to improve cardiometabolic health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP17_13

ASSOCIATIONS BETWEEN DIETARY PATTERNS, GUT MICROBIOME DIVERSITY, AND ITCH SEVERITY IN PRESCHOOL AGED CHILDREN WITH ATOPIC DERMATITIS: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

Atopic dermatitis (AD) is a common chronic inflammatory skin disease that significantly affects the quality of life, physical health, and psychological well-being of young children. In recent years, diet-gut microbiota-disease hypothesis for AD has been studied in infancy, but its implications for preschool-aged children remain less understood. This study aims to investigate the relationships among dietary patterns, gut microbiota, and disease severity in Korean preschoolers.

METHODS

This study included 97 Korean preschool children aged 3–6 years, comprising 46 with atopic dermatitis (AD) and 51 healthy controls. Dietary intake was assessed using a validated Food Frequency Questionnaire (FFQ), and dietary patterns were analyzed through factor analysis of the FFQ. AD severity was assessed using EASI, SCORAD and CDLQI scores. Gut microbiota composition was characterized using 16S rRNA sequencing. Spearman correlation analysis was conducted to examine the relationships between dietary patterns, nutrient intake, gut microbiota, and AD symptoms.

RESULTS

Through factor analysis of food group, Q1 (Traditional Korean Diet Pattern) and Q2 (Processed Food and Snack Pattern) were identified. AD-Q2 diet had lower vitamin C intake compared to those on the AD-Q1 diet (p=0.011). *Dorea* and *Anaerostipes* were more prevalent in the AD-Q2 group (LDA score: 3.4 and 3.9, respectively). The AD-Q2 group also reported significantly poor CDLQI and high nighttime itching compared to the AD-Q1 group (p=0.032 and 0.041, respectively). Insufficient intake of vitamin C was significantly associated with increased EASI and SCORAD (r=-0.52, p=0.03; r=-0.41, p=0.045, respectively), whereas the presence of *Dorea* and *Anaerostipes* also positively correlated with itching.

CONCLUSIONS

In preschool children with AD, the Processed Food and Snack dietary pattern was associated with increased disease severity, potentially mediated by *Dorea* and *Anaerostipes* abundance and vitamin C deficiency, impacting the gut environment and inflammation pathways.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP17_14

EFFECTS OF A HIGH-FIBER DIET AND MODERATE-INTENSITY EXERCISE ON THE GUT MICROBIOTA OF CHILDREN: A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Altering lifestyle behaviors to modulate gut microbiota has emerged as a potential strategy for preventing chronic diseases including obesity. However, several clinical findings have shown that the regulating effects of lifestyle on gut microbiota were inconsistent and challenging to sustain. This study aimed to evaluate the synergistic regulatory effects of nutrition and exercise on the gut microbiota in children, and to determine the factors influencing the personalized microbial response.

METHODS

We conducted a 14-weeks four-arm randomized controlled trial with 205 children aged 7-11 years, to assess the effects of a diet high in dietary fiber (HFD, n = 49, 15 g/day), moderate-intensity interval training (MIIT, n = 46, 75 min/week), and the combination of MIIT and HFD (MED, n = 50) on gut microbiota composition and SCFAs production, compared to the control group without treatment (Control, n = 49).

RESULTS

Compared to the Control and the single treatment groups (HFD and MIIT), the MED group consistently and significantly elevated the levels of fecal acetate and butyrate by 14 weeks treatment ($p < 0.05$). The subjects' baseline microbiota compositions and physical activity status could predict acetate (ROC-AUC = 0.72) and butyrate (ROC-AUC = 0.78) individualized response in MED group. Subgroup analysis further found that high-fiber diet and exercise interventions exert different modulatory impact on gut microbiota in overweight and obese children compared to normal weight children. For instance, the *Prevotella*/*Bacteroides* ratio in overweight and obese children significantly increased in all three treatments ($p < 0.05$). For normal weight children, the autoimmune diseases associated taxon *Sutterella* dramatically decreased in the MED group ($p < 0.0001$).

CONCLUSIONS

This study confirmed the synergistic effects of exercise and high-fiber diet on gut microbiota functional improvements, as well as identified the key factors contributing to the individualized regulatory efficacy of distinct lifestyle interventions. Thus, providing evidence for the development of precise lifestyle strategies to beneficially modulation the gut microbiota in children.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 44 - PRECISION AND CLINICAL NUTRITION

SOAP44_01

DEVELOPMENT OF A MINIMAL INVASIVE METHODOLOGY FOR DIABETYPING DURING THE TRADITIONAL ORAL GLUCOSE TOLERANCE TEST (OGTT) AND A MODIFIED OGTT TO PERSONALIZE TYPE 2 DIABETES TREATMENT

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BACKGROUND AND OBJECTIVES

Research shows that different tissue-specific insulin resistant phenotypes exist in persons with type 2 (pre)diabetes ((pre)T2D). These diabetypes have different efficacy to nutritional interventions, requiring a precision nutrition strategy [1,2]. Simultaneously, digital-first strategies are gaining traction to reduce participant burden, speed up recruitment, increase study population diversity and capture real-world data. Diabetyping, the methodology to subtype persons with (pre)T2D, is based on an extended oral glucose tolerance test (OGTT), which is invasive, often causing nausea, and needs to take place in a clinical setting. Therefore, we aim to develop minimally invasive alternatives of diabetyping.

METHODS

In this observational study, 17 out of the expected 57 people with overweight/(pre)T2D used a continuous glucose monitor (CGM) for 20 days and underwent three mornings of measurements: one traditional OGTT (sugar water solution drink) and two times a modified OGTT in which a standardized snack (two pieces of a gingerbread based snack, ‘Snelle Jelle’, naturel 65 gram) after an overnight fast were consumed. Continuously measured subcutaneous glucose, as well as glucose, insulin, and c-peptide via venous as well as via capillary at home sampling was collected. Agreement analyses were used to compare the different measurement methods, and the traditional and modified OGTT. Interim analysis of CGM as alternative sampling method during the traditional and modified OGTT was evaluated.

RESULTS

Preliminary RESULTS of glucose, insulin, and c-peptide venous and CGM glucose values of the traditional and modified OGTT all showed a large deviation for all timepoints (MARD > 10%). This also RESULTS in a significantly poor agreement between CGM and venous diabetyping during the traditional OGTT (κ=0.206, z=2, p=0.046) and modified OGTT (k=0.325, z=3.06, p=0.002). However, a significant moderate agreement between the traditional OGTT and the modified OGTT with venous sampling was found (κ=0.432, z=3.95, p=7.89e-05).

CONCLUSIONS

Based on preliminary RESULTS the modified OGTT with venous sampling shows potential as an alternative to the traditional OGTT. With the use of the modified OGTT complaints such as nausea, caused by the sugary drink, could be prevented. Current diabetyping cut-off values, based on traditional OGTT venous measurements, may require adaptation for CGM use. Further analysis on multiday CGM data for diabetyping as minimally invasive alternative are planned.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP44_02

A REAL-WORLD ANALYSIS OF CLINICAL OUTCOMES IN PATIENTS USING SEMAGLUTIDE 2.4 MG FOR 12 MONTHS

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BACKGROUND AND OBJECTIVES

Real-world effectiveness data for semaglutide 2.4 mg are limited. Changes in weight and cardiovascular risk factors among US patients with obesity or overweight treated with semaglutide 2.4 mg compared to those not treated with any anti-obesity medications (AOMs) were assessed.

METHODS

This retrospective study used the Komodo Research dataset and included adults with obesity or overweight, with ≥1 obesity-related comorbidity, who initiated semaglutide 2.4 mg after June 15, 2021, escalated to 2.4 mg and remained on treatment for 12 months. Reductions in weight and improvement in cardiovascular risk factors, such as systolic blood pressure (SBP), diastolic blood pressure (DBP), glycated hemoglobin (HbA1c), triglycerides (TG), low-density lipoprotein cholesterol (LDL-C) and high-density-lipoprotein cholesterol (HDL-C) were assessed compared to the non-treated cohort in the same period. Outcomes were compared between 1:4 propensity-score matched cohorts using generalized linear models adjusted for any residual imbalance.

RESULTS

At 12 months, patients treated with semaglutide 2.4 mg (n=410) had a greater reduction from baseline in weight vs non-treated cohort (n=1708) (estimated treatment difference [ETD]: −15.11%), and a greater odds of achieving weight reductions of ≥5% (odds ratio [OR]: 44.7), ≥10% (OR: 59.9) and ≥15% (OR: 48.9); all p<0.001. From baseline to 12 months, ETD (semaglutide 2.4 mg vs non-treated cohorts) was: −4.4 kg/m2 (n=1000 vs n=3351) for BMI; −6.0 mmHg (n=349 vs n=1477) for SBP; −2.7 mmHg (n=348 vs n=1480) for DBP; −0.6% (n=86 vs n=481) for HbA1c; −33.6 mg/dL (n=57 vs n=273) for TG; all p<0.001. Changes in LDL-C (n=53 vs n=252) and HDL-C (n=59 vs n=284) were −3.4 mg/dL and 0.4 mg/dL, respectively, with no statistical significance. Sample size for each biomarker varied based on availability.

CONCLUSIONS

Compared to the non-treated cohort, treatment with semaglutide 2.4 mg was associated with a greater reduction in body weight and in some cardiovascular risk factors at 12 months.

CONFLICTS OF INTERESTS
Novo Nordisk

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SOAP44_04

CHICORY INULIN REDUCES SYMPTOMS OF FUNCTIONAL CONSTIPATION AND IMPROVES SOCIAL AND EMOTIONAL WELL-BEING OUTCOMES OF QUALITY OF LIFE IN A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Functional constipation is a disorder of the gut-brain interaction (DGBI) characterized by infrequent bowel movements and hard stools, a diagnosis based on patients reported symptoms, and their interference with daily life. This disorder substantially affects patients' quality of life, who also seek non-pharmacological treatment. Thereby this study investigated supplementation with gut microbiome-targeted inulin which may be a promising alternative based on its documented impact on bowel habit1 and microbiota, and potentially the brain2.

METHODS

In a randomized, double-blind, placebo-controlled, cross-over trial, we investigated the effect of four-week daily 12g inulin intake compared to a placebo maltodextrin in 39 individuals with functional constipation according to Rome III Criteria. We assessed stool frequency and consistency, constipation-related quality of life (PAC-QOL) and symptoms (PAC-SYM)3, and stool microbiota composition using 16S rRNA gene sequencing.

RESULTS

In the cross-over analysis we observed that inulin intake increased stool frequency with 0.53 (0.26) p=0.046 defecations per week compared to placebo, though not stool consistency. This was concurrent with improvements in PAC-QOL (-0.41 (0.15), p=0.007) and PAC-SYM (-0.35 (0.15), p=0.022), compared with placebo. There was an increase in the relative abundance of known butyrate-producing bacterial genera in the stool microbiota. Further investigation indicated a carry-over effect, whereby half of those receiving inulin in the first period had a remarkable placebo response in the second period. These participants had the largest improvements in all outcomes during inulin intake, and higher baseline and wash-out relative abundances of butyrate producing bacteria, and lower but more responsive *Bifidobacterium* spp.. To address this carry-over bias, we analyzed only the first period as a parallel trial which confirmed the positive effect of inulin on bowel habit, PAC-QOL, PAC-SYM, and affirmed its bifidogenic effect. Improvement in social and emotional well-being scores were consistent across both the cross-over and first period analyses while absent during placebo for both sequences, indicating a genuine effect of inulin intake.

CONCLUSIONS

This cross-over study confirmed inulin as promising nonpharmacological treatment for functionally constipated patients by increasing stool frequency and modifying microbiota. It improved constipation-related quality of life, social-emotional well-being and abdominal symptoms. Future trials targeting the gut microbiome should consider the carry-over effect.

CONFLICTS OF INTERESTS

DM is a former employee of Sensus (Royal Cosun)EV and VD are employees of Sensus (Royal Cosun)

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SOAP44_06

ASSOCIATION BETWEEN MILK CONSUMPTION AND THE PREVALENCE OF SARCOPENIA FROM NHANES 2011-2018

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BACKGROUND AND OBJECTIVES

Sarcopenia has the potential to result in a deterioration in quality of life. It has been determined that nutrition plays a critical role in both the prevention and treatment of the condition. However, most people find it difficult to accurately measure the nutrients in their daily diet and therefore prefer nutrient-rich foods such as milk, which may contribute to the maintenance of healthy bones and muscles. Nevertheless, the optimal choice of milk, whether whole, low-fat, or skimmed, for individuals with sarcopenia remains unclear and requires further investigation.

METHODS

We used the data from the National Health and Nutrition Examination Survey (NHANES) 2011-2018 and included participants with complete milk questionnaire data and who underwent dual-energy X-ray absorptiometry (DXA) scans. Meanwhile, we employed the definition and diagnostic criteria for sarcopenia as established by the Foundation for the National Institutes of Health (FNIH). Three statistical METHODSwere used to assess the correlations, including weighted multivariate logistic regression, subgroup analysis and cox proportional hazards models.

RESULTS

A total of 8292 participants were included in this study, and 750 (9.0%) people were classified as having sarcopenia with aged 43±11.5. To avoid overfitting, least Absolute Shrinkage and Selection Operator (Lasso) was used before logistic regression. We observed that 1% fat milk was significantly linked with the lower risk of sarcopenia (OR 0.68, 95% CI 0.03-0.75, P=0.037< 0.05). According to subgroup analysis stratified by gender, body mass index (BMI), and age, the significant relationship between 1% fat milk and sarcopenia remained in the age (≥40 years) group, and the BMI (＞24.9 kg/m2) group ($p < 0.05$). Among individuals with sarcopenia, 19 experienced all-cause mortalities. Following adjustment for confounding variables, it was observed that soy milk consumption was associated with an increased all-cause mortality rate among sarcopenia patients ($p < 0.05$).

CONCLUSIONS

Moderate fat intake is necessary to maintain muscle health, while a high-fat diet can trigger chronic inflammation, which is a risk factor for sarcopenia. And our study indicates that patients with sarcopenia should take in 1% or lower-fat milk instead of whole milk and soy milk.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP44_07

CAGRISEMA TARGETS AND ACTIVATES KEY CNS REGIONS INVOLVED IN APPETITE REGULATION IN RATS

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BACKGROUND AND OBJECTIVES

CagriSema, a combination of long-acting analogues of GLP1 (semaglutide) and amylin (cagrilintide), is in clinical development for treatment of obesity and type 2 diabetes. CagriSema leads to a greater weight loss than either monotherapy, both believed to contribute to central nervous system (CNS)-mediated suppression of appetite. To explore the actions of CagriSema in CNS, we investigated drug distribution in whole rat brains using 3D imaging, followed by more detailed analyses on regional distribution and neuronal activation.

METHODS

Chow fed male rats were dosed with fluorescently labelled semaglutide or cagrilintide (VT750 and AF488; 100 nmol/kg I.V) and euthanized at several different timepoints after administration. Drug distribution was visualized and quantified in whole rat brains using 3D imaging of direct fluorescence, or in 2D brain sections using indirect anti-AF488 immunohistochemistry (IHC) to allow for combined *in situ* hybridization and IHC of target receptors. Acute neuronal activation was assessed in dorsal vagal complex (DVC) using cFos IHC after administration of unlabelled drug alone or in a combination (10 nmol/kg each, S.C).

RESULTS

Labelled cagrilintide and semaglutide distributed in a time dependent manner to similar regions of the CNS, such as the circumventricular organs, the mediobasal hypothalamus, the DVC in the hindbrain, and the septum. The drug distribution overlapped largely with receptor expression of the respective targets (Glp1r and Calcr) in areas of access, but the spatial expression pattern of the receptors differed slightly. Distribution of cagrilintide and semaglutide to DVC was associated with drug induced neuronal activation in this region.

CONCLUSIONS

Cagrilintide and semaglutide target key regions in the rat CNS that regulate appetite. Both Glp1r and Calcr are expressed in the regions directly targeted by either drug but display some notable differences in expression pattern. This highlights the potential complimentary mechanisms and the value of targeting both biological systems simultaneously with CagriSema.

CONFLICTS OF INTERESTS
Novo Nordisk

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SOAP44_09

GASTROINTESTINAL INFLAMMATION IS ASSOCIATED WITH SYSTEMIC INFLAMMATION AND GUT SYMPTOMS IN FEMALE UNIVERSITY TEAM SPORT PLAYERS

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BACKGROUND AND OBJECTIVES

Female high-performance athletes frequently experience exercise-induced gastrointestinal syndrome (EIGS) which is characterised by gastrointestinal (GI) and systemic inflammation with unwanted GI symptoms, affecting health, quality of life, and sport performance (1,2). Data on the GI inflammatory markers used to identify EIGS and the related GI symptoms are lacking in high-performance female team sport players. This study aimed to measure GI inflammation and integrity markers and to determine their association with systemic inflammation, GI symptoms, and fitness levels in female university team sport players.

METHODS

This cross-sectional study included 69 university female team sport players from soccer (23%), netball (31%), and hockey (44%) teams. Plasma GI and systemic inflammatory markers at rest were analysed with the Q-Plex Human Environmental Enteric Dysfunction Quansys immunoassay including intestinal fatty acid binding protein (I-FABP), fibroblast growth factor-21 (FGF-21) and cluster of differentiation 14 (sCD14), alpha-1-acid glycoprotein (AGP), and C-reactive protein (CRP). Fitness level was determined with a three-minute aerobic test (VO2 max). GI symptoms in the seven days before the study were determined and categorised using a five-point severity Lickert scale. Associations between GI and systemic inflammatory markers, symptoms, and fitness level were tested with a partial Pearson correlation, Spearman correlation, multivariable linear regression, and independent t-tests. Ethical clearance was obtained from the Health Research Ethics Committee.

RESULTS

Of the players, 32%, 23%, and 96% had a resting plasma I-FABP, FGF-21 and sCD14 respectively above the average 90th percentile reported in other athletic populations (3-8). AGP was above the reference range of 1 g/L in 78% of players. Resting sCD14 positively correlated with CRP ($p = 0.048$) and AGP ($p < 0.001$). 48% of players reported at least one GI symptom in the 7 days before data collection, most frequently bloating (29%), abdominal noise (23%), flatulence (15%), and eructation (13%). Resting sCD14 was higher in players with heartburn ($p = 0.049$) and positively correlated with heartburn severity ($p = 0.028$). The player's VO2 max did not significantly correlate with resting GI inflammation markers.

CONCLUSIONS

Resting sCD14 was elevated and associated with chronic low-grade systemic inflammation (elevated AGP) and heartburn in high-performance university female team sport players. Strategies to lower GI inflammation and associated systemic inflammation and GI symptoms can be investigated to contribute to female athlete health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP44_10

ISOTOPIC MEASUREMENT OF IRON ABSORPTION AND LOSS AND THE EFFECT OF IRON SUPPLEMENTATION WITH AND WITHOUT PREBIOTICS IN SOUTH AFRICAN CHILDREN WITH VIRALLY-SUPRESSED HIV: FINDINGS FROM THREE PROSPECTIVE STUDIES

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BACKGROUND AND OBJECTIVES

Children living with HIV are often iron-deficient. This may be due to impaired iron absorption, which could increase dietary iron requirements and blunt efficacy of iron interventions. We compared iron absorption from different iron interventions and the habitual diet between children with and without HIV. We further determined whether providing prebiotic galacto-oligosaccharides (GOS) as adjunct treatment to oral iron supplementation improves efficacy and safety of oral iron in iron-deficient children with HIV.

METHODS

We performed three prospective studies in South Africa. In Study 1, we compared fractional iron absorption (FIA) from isotopically-labelled iron-fortified maize porridge, a lipid-based nutrient supplement (LNS) and an oral iron supplement in iron-deficient children with (n=43) vs without (n=45) HIV. In Study 2, using a novel isotope dilution method, we quantified habitual dietary iron absorption and losses over 6 months in children with (n=29) and without (n=36) HIV. Study 3 was a 12-week randomised, double-blind trial of oral iron (50mg/day) given with 7.5g GOS or placebo in iron-deficient children with HIV (n=86), with serum ferritin as primary outcome.

RESULTS

Comparing children with vs without HIV: in Study 1, median (IQR) FIA from porridge, LNS and oral iron were 7.6% (3.8,12.8) vs 10.5% (6.1,13.1) (P=0.23), 5.6% (3.6,10.2) vs 6.4% (4.3,9.1) (P=0.92) and 26.0% (16.0,33.3) vs 24.8% (19.2, 30.3) (P=0.82); in Study 2, dietary iron absorption (mg/d) was 1.09 (0.82,1.32) vs 1.44 (0.85,2.06) (P=0.041), iron losses were 0.80 (0.43,1.13) vs 0.78 (0.58,1.57) (P=0.089), and iron gains were 0.33 (-0.01,0.71) vs 0.41 (0.04,0.89) (P=0.773). In Study 3, children receiving iron with GOS had 33% higher ferritin (P=0.053) and greater gut integrity (P=0.088), and a lower incidence of fever (P=0.058) and rhinorrhoea (P=0.018) but no significant differences in gut inflammation or abundances of enteropathogens.

CONCLUSIONS

Compared to children without HIV, children with virally-suppressed HIV have low-level inflammation and lower habitual dietary iron absorption. However, their ability to absorb iron from supplements and fortificants is comparable to children without HIV, and they do not show increased gastrointestinal iron losses. Therefore, oral iron should be effective in iron-deficient children with HIV, and providing iron with GOS may improve its efficacy and safety.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP44_12

SEMAGLUTIDE REDUCES HOSPITAL ADMISSIONS IN PATIENTS WITH OBESITY OR OVERWEIGHT AND ESTABLISHED CVD

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BACKGROUND AND OBJECTIVES

Semaglutide, a glucagon-like peptide-1 (GLP-1) receptor agonist, reduced the rates of cardiovascular (CV) death, myocardial infarction and stroke in patients with high CV risk and overweight or obesity but without diabetes. We sought to determine the impact of semaglutide on total hospital admissions and duration of hospital stay, in any indication.

METHODS

SELECT compared the effect of treatment with semaglutide 2.4 mg and placebo weekly on CV events in 17,604 patients aged ≥45 years with established CV disease, with body mass index (BMI) ≥27 kg/m2 and without diabetes. Hospital admissions and days in hospital, for any indication, in both treatment groups were evaluated.

RESULTS

Patients (age 61.6±8.9 years, 72.3% male, BMI 33.3±5.0 kg/m2) were followed for a mean of 39.8±9.4 months. The percentage of patients with a first hospital admission was lower in the semaglutide group for any indication (33.4 vs 36.7%, hazard ratio [HR] 0.89 [0.84, 0.93], p<0.0001) and for serious adverse events (30.3 vs 33.4%, HR 0.88 [0.84, 0.93], p<0.0001). The number of total hospitalisations was lower in the semaglutide group for all indications (18.3 vs 20.4 admissions per 100 patient years, HR 0.90 [0.85, 0.95], p=0.0002) and for serious adverse events (15.2 vs 17.1 admissions per 100 patient years, HR 0.89 [0.84, 0.94], p<0.0001). The number of days hospitalised per 100 patient years was lower in the semaglutide group for all hospitalisations (157.2 vs 176.2 days, risk ratio [RR] 0.89 [0.82, 0.98], p=0.01) and hospitalisations for serious adverse events (137.6 vs 153.9 days, RR 0.89 [0.81, 0.98], p=0.02). No statistical treatment heterogeneity was observed for the reduction in hospital admissions with semaglutide on selected subgroups including BMI, age and gender.

CONCLUSIONS

This cohort had a high rate of admissions. Treatment with semaglutide 2.4 mg once weekly resulted in significant reductions in hospital admissions and overall time spent in hospital, extending the benefits beyond those of CV events.

CONFLICTS OF INTERESTS
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SOAP44_13

CALCIUM METABOLISM IN HEALTHY MEN AND WOMEN IN RESPONSE TO DIETARY SALT: A RANDOMIZED CROSSOVER TRIAL

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BACKGROUND AND OBJECTIVES

Previous research showed that Black adolescent girls retain more calcium and excrete less urinary sodium compared to their white counterparts when consuming a high sodium diet. However, the influence of dietary salt on calcium absorption efficiency and excretion across racial, sex, and age groups remains poorly understood. This study's objective was to compare subgroup differences in fractional calcium absorption, as well as 48-hour urinary sodium and calcium excretion in response to a low- and high-salt diet in healthy young diverse adults.

METHODS

This 2-phase crossover trial included 64 healthy persons aged 18-35, equally distributed among four race groups (White, Black, Hispanic/Latino, and Asian) with an equal number of men and women in each group (n=16 per race). Participants were randomly assigned to consume controlled diets for two days, with either low (2300 mg/Na/day) or high salt levels (3700 mg/Na/day). Fractional calcium absorption was assessed using dual calcium isotopes (Ca-44 oral and Ca-43 intravenous) measured by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). Two twenty-four-hour urine samples were collected on each diet and urinary calcium and sodium excretion was quantified using ICP-Optical Emission Spectrometry (ICP-OES). Data were analyzed using a mixed-model ANOVA by SPSS.

RESULTS

Salt intake increased urinary sodium excretion but did not alter calcium metabolism on average. No sex differences were found, but Black adults excreted less urinary calcium than White adults.

CONCLUSIONS

These findings suggest that the racial differences in calcium and sodium retention in response to dietary salt previously reported in the Black and White adolescent girls was not explained by differences in calcium absorption in racially diverse young adults.

CONFLICTS OF INTERESTS
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SOAP 07 - BASIC RESEARCH IN NUTRITION

SOAP07_01

ENHANCED BIOACCESSIBILITY AND ANTI-INFLAMMATORY EFFECTS OF PHLOROTANNINS FROM ECKLONIA CAVA THROUGH IN VITRO DIGESTION AND FERMENTATION

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BACKGROUND AND OBJECTIVES

Phlorotannins (PTs), a class of polyphenols known for their notable anti-inflammatory properties, remain underexplored in terms of bioaccessibility. This study utilized an in vitro digestion and fermentation model to investigate the transformation of phlorotannins in *Ecklonia cava* (EC) and their associated anti-inflammatory effects.

METHODS

In vitro static digestion models simulated human gastrointestinal processes, followed by anaerobic fermentation using gut microbiota-derived from human fecal samples. LC-MS/MS quantified phenolic extracts from different digestive stages. Effects of PT-derived metabolites were evaluated using RAW 264.7, Caco-2, and Jurkat cells through ELISA, RT-PCR, and Western blotting to analyze changes in anti-inflammatory properties across digestive stages and assess modulation of the AhR pathway. Gut microbiota composition was examined using PCR.

RESULTS

RESULTS demonstrated that free PTs exhibited the highest retention in the stomach, which decreased to 10.75% after small intestinal digestion but increased to 25.34% following colonic fermentation. In contrast, the release of bound PTs declined during digestion but increased 2.6-fold after fermentation compared to digestion alone. LC-MS/MS analysis revealed that dieckol was the dominant phenolic compound in undigested EC and gastric digestion stages, whereas phlorofucofuroeckol A and eckstolonol were prevalent during intestinal digestion and colonic fermentation. Bound PTs exhibited superior bioactivity due to microbial conversion into smaller, bioactive compounds and significantly enhanced the abundance of Lactobacillus and Bifidobacterium, demonstrating strong prebiotic effects. Comparative experiments between raw PT extracts and PT-derived metabolites revealed that the metabolites significantly enhanced the expression of tight junction proteins ZO-1, Occludin, and Claudin in Caco-2 cells. Additionally, the metabolites more effectively reduced anti-inflammatory markers in RAW 264.7 cells. In Jurkat cells, the metabolites activated the AhR/IL-22/STAT3 pathway, further confirming their superior bioactivity.

CONCLUSIONS

These findings highlight that bound forms of PT enhance bioaccessibility and underscore the pivotal role of microbial fermentation in amplifying the anti-inflammatory effects of PTs. This study provides insights for developing functional foods and supplements targeting anti-inflammatory benefits and gut health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP07_03

EFFECTS OF WHOLE MEAL SOURDOUGH BREAD WITH OR WITHOUT BAKER'S YEAST ON APPETITE, ENERGY INTAKE, AND POSTPRANDIAL METABOLIC RESPONSES: A RANDOMIZED, BLINDED, CROSS-OVER STUDY

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BACKGROUND AND OBJECTIVES

Bread is a staple carbohydrate source in Europe, and wholemeal varieties may provide better metabolic responses and greater satiety compared to white bread. This study aimed to evaluate the effects of wholemeal bread leavened with either baker's yeast (WYB), sourdough (WSB), or a combination of both (WSYB) on appetite control and metabolic outcomes in healthy individuals.

METHODS

In a double-blind, randomized crossover trial, 44 healthy participants (25 ± 4 years, BMI: 22 ± 2 kg/m²) consumed 180 g of each type of bread daily for two weeks, separated by a 2-week washout period. Participants reported their usual food intake and provided faecal samples for microbiota analysis. On the final day of each intervention, participants ate 100 g of the test bread for breakfast. Measurements included oral processing, gastric emptying, postprandial glucose, C-peptide, appetite, and hormonal responses. The primary outcome was ad-libitum energy intake at the following lunch.

RESULTS

There were no differences in ad-libitum energy intake at lunch following the consumption of the test breads. However, WYB and WSYB were consumed more slowly than WSB, leading to slightly higher satiety ($p < 0.05$). WSYB increased C-peptide levels, WYB elevated PYY, and both WSB and WYB stimulated higher GLP-1 release ($p < 0.05$). No significant differences were observed in gastric emptying, glucose responses, ad-libitum energy intake, habitual energy intake, cholesterol levels, or gut microbiota composition ($p > 0.05$).

CONCLUSIONS

Although there were small differences in some metabolic responses, the findings suggest that wholemeal bread leavened with baker's yeast and/or sourdough have similar effects on appetite regulation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP07_04

THE IMPACT OF OMEGA-3 FATTY ACIDS ON MESENTERIC AND PERIPANCREATIC ADIPOSE TISSUE DEPOTS DURING MURINE PANCREATIC CARCINOGENESIS

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BACKGROUND AND OBJECTIVES

Preclinical and epidemiological studies have shown that high-fat diets (HFD), high in saturated fatty acids (FA), can promote pancreatic cancer development. However, the type of fat is crucial in modulating tumor growth. Since adipose tissue is recognized as a significant contributor to cancer growth, we examined the impact of HFDs with different omega-6 to omega-3 FA ratios on pancreatic cancer development and analyzed the roles of mesenteric adipose tissue (MAT) and peripancreatic adipose tissue (PPAT)

METHODS

To study the impact of early high omega-3 FA diet intervention, we conducted an initial short-term study on cohorts of male and female *KrasLSL-G12D/+; Ptf1aCre/+* (KC) mice that were randomly assigned to a high-fat diet (HFD) with an omega-6: omega-3 FA ratio of 10:1 or a high fat, high omega-3 fatty acid diet (HFHO) with an omega-6: omega-3 FA ratio of 1:1 (matched at 60% kcals from fat), and fed their diets during eight weeks. Then, to study the effects of a dietary switch in the context of obesity, cohorts of male and female KC mice were fed a HFD with an omega-6: omega-3 FA ratio of 10:1 during 8 weeks. Then, half the of the mice remained on the HFD while the other half underwent a dietary switch to a HFHO diet. Mice were fed these diets for an additional 13 weeks.

RESULTS

KC mice fed a HFHO diet early on, during the first eight weeks, showed significant reductions in pancreas and MAT weights, pancreatic acinar-to-ductal metaplasia, cell proliferation, and adipocyte size. They also had increased MAT M2 macrophage populations compared to mice fed a HFD. When a diet high in omega-3 FA was introduced after obesity induction and continued for 13 weeks, we observed significant differences in body weight gain, fat mass, and increased serum adiponectin, in HFHO-fed mice compared to HFD-fed mice. Additionally, HFHO diet induced sex-dependent changes in PPAT metabolites, with female KC mice showing significant differences in saturated and monounsaturated FAs. Furthermore, HFHO-fed mice exhibited reduced pancreatic acinar-to-ductal metaplasia compared to mice fed a HFD throughout the entire period. However, no differences in cell proliferation or cancer incidence were observed between the HFD and HFHO groups.

CONCLUSIONS

Omega-3 FA can only partially counteract the effects of a HFD on the pancreas and adipose tissue. This mitigating effect is more pronounced in mice before they develop obesity. Further studies are needed to understand how specific metabolites in adipose tissue might prevent or promote pancreatic cancer.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP07_05

INVESTIGATION OF THE EFFECTS AND MECHANISMS OF LYCOPENE ON NON-ALCOHOLIC FATTY LIVER DISEASE BASED ON THE FXR/FGF21-MEDIATED HEPATIC-ADIPOSE AXIS

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BACKGROUND AND OBJECTIVES

Non-alcoholic fatty liver disease (NAFLD) is associated with lipid metabolism disorders that primarily occur within the hepatic-adipose axis. Lycopene may regulate hepatic and adipose lipid synthesis and fatty acid oxidation pathways through the Farnesoid X Receptor (FXR)/Fibroblast Growth Factor 21 (FGF21) signaling, improving lipid deposition in both the liver and adipose tissues, and thereby slowing the progression of NAFLD.

METHODS

This study investigates the effects and underlying mechanisms of lycopene on NAFLD from a nutritional perspective, with a focus on the maintenance of lipid metabolic homeostasis within the hepatic-adipose axis. Using high-fat diet-induced C57BL/6J mice, a fatty acid-induced NAFLD model, and a co-culture system of hepatic and adipose cells, this research systematically explores the regulatory impact of lycopene on lipid metabolism in the hepatic-adipose axis via the FXR/FGF21 pathway.

RESULTS

The RESULTS show that lycopene intervention significantly improves serum and hepatic lipid metabolism in NAFLD mice, with histopathological analysis revealing a marked reduction in hepatic lipid accumulation following lycopene treatment. Lipidomic analysis indicates that lycopene primarily downregulates the levels and types of triglycerides (TG) and diglycerides (DG) in the liver. Lycopene upregulates the expression of FXR, FGF21, PPAR-α, and AMPK in the livers of NAFLD mice, while downregulating the gene and protein expression of SREBP-1C and FAS. Additionally, lycopene increases the expression of FGF21 and PPAR-γ in adipose tissues. In vitro co-culture studies further reveal that lycopene enhances the expression of FGF21, PPAR-γ, and ADIPO proteins in AmL12 cells, with protein levels increasing in a dose-dependent manner. This effect is mediated through the modulation of FGF21, PPAR-γ, and ADIPO expression in adipocytes, which in turn elevates FGF21 levels in AmL12 cells and decreases CD36, SREBP-1, and FAS protein levels. Transfection with SiFXR RESULTS in a significant reduction in FXR and FGF21 protein expression, demonstrating that downregulation of FXR expression in AmL12 cells reduces FGF21 protein levels.

CONCLUSIONS

Overall, this study confirms that lycopene improves NAFLD through the interaction of FXR and FGF21 within the hepatic-adipose axis.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP07_06

SUGAR SWEETENED BEVERAGE INTAKE, PHYSICAL ACTIVITY AND NUTRITIONAL STATUS OF SCHOOL CHILDREN IN KAMPALA, UGANDA

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BACKGROUND AND OBJECTIVES

Despite the increase in non-communicable diseases (NCDs), there is increased production and consumption of sugar sweetened beverages (SSBs) among school going children making them susceptible to develop NCDs leading to early onset of morbidity which is of public health concern.

METHODS

This cross sectional study investigated SSB consumption, nutritional status, physical activity level and correlates of SSB intake among primary school children age 9-13 year in Kampala city. The association between variables were established via Chi-square.

RESULTS

Overweight and obesity are on the rise and account for 26.4% among the respondents. RESULTS showed a significant association ($P \leq 0.05$) between dietary diversity and nutritional status. More than half of the pupils did not meet the WHO recommended vigorous physical activity level of at least 75 minutes per week. About 63% and 94% of the respondents respectively had consumed soda and locally sweetened beverages at least once in 24 hours. For the majority of the pupils, parents/guardians were responsible for buying the SSB consumed (55.2%) and deciding on the type of SSB to be carried to school (56.3%). There were also significant associations ($p \leq 0.05$) between consumption of SSBs and nutritional status, physical activity and parents buying the SSBs and influence.

CONCLUSIONS

Most pupils did not achieve the levels of physical activity recommended. Consumption of SSBs is positively associated with overweight and obese, physical activity and parents influencey. Efforts should be made to promote physical activity participation and good dietary practices within school and home environments.

CONFLICTS OF INTERESTS

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SOAP07_07

NUTRITIONAL EFFECTS OF SPIRULINA LIQUID EXTRACT ON PLASMA PARAMETERS AND FATTY ACID AND GLUCOSE LIVER METABOLISMS IN SEDENTARY AND MODERATE RUNNING MALE WISTAR RATS

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BACKGROUND AND OBJECTIVES

It is well-recognized that moderate physical activity is a beneficial factor in the prevention of lipid and carbohydrate metabolism disorders (Myers et al., 2019). Another way to prevent the onset of diseases such as diabetes or obesity is to use food supplements rich in hypolipidemic or antioxidant molecules (Bonetti et al., 2022). The use of *Spirulina*extracts, rich in phycocyanin which is an antioxidant molecule has been able to show its effectiveness on the regulation of lipid and glucose metabolism parameters (Kasbi-Chadli et al., 2021). The objective of this work was to combine the effects of a *Spirulina* liquid extract (SLE) with moderate running activity in order to search a potentiation of these two factors on plasma and hepatic parameters related with fatty acid and glucose metabolisms.

METHODS

Three week-old male Wistar rats were fed a control diet (SAFE A04). Four groups were determined: a sedentary control group (C), a sedentary group supplemented with SLE (SLE), a group with moderate activity (T) and a group with moderate activity and supplemented with SLE (T-SLE). After 8 weeks of nutritional monitoring and treadmill running, rats were euthanized and plasma and liver were collected. In plasma, triglyceride (TG), cholesterol (Chol) and glucose concentrations were determined as well as insulinemia. At the 7th week, a glucose tolerance test (GTT) has been conducted. The expression of the liver genes IRS1, Gys1, CD36, and PPAR-alpha, was followed to observe the combined effects of SLE and training.

RESULTS

At the end of the 8th week, a lower bodyweight was observed in the T and T-SLE groups by comparison with the C and SLE ones respectively. Concerning GTT, even if no training effect has been observed, SLE has been shown to decrease glycemia (SLE vs C; T-SLE vs T). Concerning plasma lipid profile, only a training effect has been reported while no effect of SLE was observed. Training has also been shown to decrease TG and Chol concentrations, and the atherogenic index (AIP), with an even higher reduction in AIP observed in the T-SLE group. Finally, concerning the expression of genes involved in glucose and lipid metabolisms, only Gys1 and PPAR-alpha gene expressions were upregulated while CD36 one was downregulated in the T-SLE group, by comparison with the control one.

CONCLUSIONS

This study has reported that SLE supplement combined with moderate training activity was able to improve AIP value and glycemia. In the liver, it seemed that this combination was able to improve balance between fatty acids transport and glycogen synthesis.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP07_08

LYCIUM BARBARUM POLYSACCHARIDES REGULATED HIGH-FAT DIET INDUCED METABOLIC ASSOCIATED FATTY LIVER DISEASE (MAFLD) THROUGH HEPATIC-ADIPOSE AXIS

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BACKGROUND AND OBJECTIVES

The global prevalence of Metabolic associated fatty liver disease (MAFLD) is high and on the rise, while the pathogenesis of NAFLD has not yet been clarified and effective treatment measures are lacking. *Lycium barbarum* polysaccharides (LBP) intervention has been found to exert anti-MAFLD lipid metabolism disorders, but there is a lack of systematic studies on organ interactions, especially on the liver-fat axis. Therefore, there is an urgent need to explore effective prevention and treatment strategies and novel targets for MAFLD.

METHODS

Animal experiments were carried out using 6-week-old C57BL/6J male mice fed 60% high-fat chow to construct a mouse MAFLD model, and different doses of LBP (50mg/kg, 100mg/kg, 150mg/kg) were added to the model for 12 weeks. At the end of the intervention, relevant indexes were detected by HE staining, RT-qPCR and Western Blot to explore the organ interaction of the liver-fat axis.

RESULTS

The RESULTS of animal experiments showed that the livers of MAFLD model mice showed obvious fat accumulation and morphological changes, LBP intervention had no obvious effect on the body weight of mice, but it could significantly improve the body shape and pathological characteristics of mice, reduce the area and number of hepatic fat vacuoles, improve the inflammatory reaction of adipose tissue, and the high-dose LBP intervention group was able to reduce the serum free fatty acid level. Lipidomics test RESULTS showed that LBP intervention may have some up-regulation effect on glycerophospholipid level, able to up-regulate the LPC and PC species and quantity in glycerophospholipid class, in which the regulation of lipid metabolism was more obvious in the high-dose group. Through WB, it was found that LBP intervention was able to up-regulate the expression of FXR, FGF21, AMPK and ADIPO proteins in the livers of MAFLD mice, down-regulate the expression of CD36 proteins, and significantly elevate the levels of FGFR and FGF21 protein expression in the adipose tissues of the mice, and the protein level of ADIPO was significantly elevated in the adipose tissue of the mice in the LBP-M and LBP-H groups.

CONCLUSIONS

The present study elucidated the mechanism and targets of LBP in regulating lipid metabolism disorders in the hepatic-fatty axis of MAFLD mice by affecting the FXR/FGF21 pathway, which provides a new nutritional intervention strategy and potential therapeutic target for the prevention and treatment of metabolic diseases.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP07_10

THE IMPACT OF SUCRALOSE EXPOSURE ON TESTICULAR DAMAGE AND MALE INFERTILITY: ROLE OF OXIDATIVE STRESS AND AUTOPHAGY

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BACKGROUND AND OBJECTIVES

The effects of non-nutritive sweeteners (NNS) on male reproductive health, particularly at the cellular level, remain inadequately understood. Sucralose, a widely used artificial sweetener, is highly stable and resistant to degradation in wastewater treatment, raising concerns about its environmental and physiological impacts. However, there is a lack of evidence regarding the modulation role of NNS and the impact of sucralose exposure on male infertility. In this study, for the sake of food safety, we investigated the relationship between sucralose consumption and male reproductive function, as well as the related modulation sites affected by sucralose exposure. This study aimed to investigate the impact of sucralose on male reproductive health by examining its effects on cellular proliferation, autophagy, and oxidative stress, as well as on reproductive physiology in animal models.

METHODS

In vitro experiments were conducted using TM3 (Leydig) and TM4 (Sertoli) cell lines to assess sucralose's effects on cell proliferation and survival. Autophagy disruption and oxidative stress pathways were examined. Additionally, male Sprague-Dawley (SD) rats were exposed to sucralose via oral gavage for two months to evaluate its impact on sperm viability, steroidogenesis, and overall reproductive health.

RESULTS

In vitro findings revealed that sucralose significantly reduced cell survival by disrupting autophagy through inhibition of autophagosome formation and lysosome fusion, leading to increased oxidative stress and DNA damage. In vivo, sucralose exposure in SD rats resulted in suppressed sperm viability, reduced testosterone levels, and impaired reproductive health. These effects were mediated by oxidative stress, autophagy disruption, and suppressed steroidogenesis.

CONCLUSIONS

These findings enhance our understanding of sucralose's adverse effects on male reproductive physiology and provide insights into the underlying mechanisms. Additionally, the environmental persistence of sucralose and its potential leakage into wastewater systems underscore broader implications for public health and ecosystem stability. This research highlights the need for cautious utilization of non-nutritive sweeteners and informs food safety policies and wastewater management practices aimed at mitigating the release of sucralose into the environment.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP07_11

INVESTIGATING THE THERAPEUTIC POTENTIAL OF HINOKITIOL IN SUPPRESSING UTERINE LEIOMYOMA PROLIFERATION AND EXTRACELLULAR MATRIX ACCUMULATION

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BACKGROUND AND OBJECTIVES

Uterine leiomyomas are prevalent benign tumors associated with high recurrence and treatment resistance, primarily due to their proliferative characteristics, stem cell-like properties, and extracellular matrix (ECM) accumulation. Current treatments, including surgery and hormonal therapies, often fail to prevent recurrence. Hence, alternative therapies utilizing natural compounds are being explored. Hinokitiol, a compound with documented antitumor properties, has been proposed to target various aspects of tumor biology, including proliferation, apoptosis, and autophagy. Our study aims to determine whether hinokitiol can effectively reduce uterine leiomyoma proliferation and ECM accumulation.

METHODS

Uterine leiomyoma cells and normal myometrial cells were cultured under standard conditions and treated with hinokitiol. The MTT assay was used to assess cell proliferation and viability. Cell cycle distribution and apoptosis levels were analyzed by flow cytometry. The expression of autophagy and ECM-related proteins was quantified through western blotting and immunohistochemistry. In vivo studies were performed by injecting female mice with uterine leiomyoma cells and treating them with hinokitiol via oral gavage, followed by measurement of tumor size and ECM-related protein expression after treatment.

RESULTS

Treatment with hinokitiol significantly suppressed the proliferation of uterine leiomyoma cells while sparing normal myometrial cells. This suppression correlated with a G1/S phase cell cycle arrest and increased apoptosis. Hinokitiol also enhanced autophagic activity, which is crucial for regulating ECM accumulation. In vivo, hinokitiol treatment led to reduced tumor growth and lower expression of ECM-related proteins, suggesting its potential in mitigating ECM accumulation associated with tumor progression.

CONCLUSIONS

The study highlights hinokitiol's efficacy in inhibiting uterine leiomyoma proliferation, promoting apoptosis, and reducing ECM accumulation through autophagy modulation. These findings support the potential of hinokitiol as a novel, natural therapeutic option for uterine leiomyoma management.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP07_12

HISPIDIN IS A NUTRITIOUS FOOD INGREDIENT FOR ENHANCING WOUND HEALING

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BACKGROUND AND OBJECTIVES

Hispidin, a polyphenol component mainly derived from the medicinalmushroom species Phellinus and Inonotus, shows promise for biomedical applications, yet its potentialin wound healing remains largely unexplored. This research investigates the wound healing effects ofhispidin through in vitro and in vivo experiments, while also evaluating its antimicrobial propertiesand safety profile.

METHODS

In vitro scratch assays were conducted to evaluate the impact of hispidinon the migration of NIH-3T3 cells. The wound healing potential of hispidin was assessed in rats usingexcision wounds, dead space wounds, and linear incisions, treated with various topical ointmentsincluding a simple ointment, 2.5% (w/w) and a 5% (w/w) hispidin ointment, and a 0.2% (w/w)nitrofurazone ointment, administered at 0.2 g daily for 14 days.

RESULTS

Hispidin demonstratedantimicrobial properties and was particularly effective against Staphylococcus epidermidis. Hispidinenhanced NIH-3T3 cell viability, and promoted wound closure in scratch assays, correlating withincreased levels of FGF21, TGF-β1, EGF, and VEGF.

CONCLUSIONS

These findings highlight hispidin’s potential in wound care, demonstratingits antimicrobial, regenerative, and safety properties.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP07_13

BUGS GOT MILK? EXPLORING THE POTENTIAL OF LACTOSE AS A PREBIOTIC INGREDIENT FOR THE HUMAN GUT MICROBIOTA OF LACTOSE TOLERANT INDIVIDUALS

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BACKGROUND AND OBJECTIVES

Milk consumption is important to help meet daily nutrient requirements. Emerging studies have demonstrated an additional benefit from regular dairy consumption: improvement of gut health. Lactose, present in dairy products, has been associated with digestive discomfort in individuals who are lactose intolerant or have inadequate lactase activity. Yet, a new perspective on this dietary component has emerged – its potential as a prebiotic for lactose tolerant population. The objective of this study is to assess the acute impact of lactose ingestion on the gut microbiota of adults.

METHODS

We employed a short-duration *in vitro* batch colonic model and a long-duration *in vitro* dynamic multi-vessel colonic model to evaluate the effects of chronic ingestion of lactose on the gut microbiota. In both cases, a mixture of lactose/galactose/glucose was administered in a defined proportion to mimic lactose metabolism and galactose/glucose absorption in the small intestine in lactose tolerant adults.

RESULTS

A modulatory prebiotic effect was revealed on the structure and metabolism of the microbiota upon treatments simulating the ingestion of three doses of lactose, equivalent to the consumption of half, one, and two glasses of cow's milk. The long-duration model confirmed this potential, leading to an increase in the relative abundance of the beneficial genera *Lactobacillus*, *Akkermansia*, and *Faecalibacterium*, while the usually detrimental genus *Clostridium* decreased. Additionally, an increase of health-promoting microbial metabolites was observed, such as acetate, propionate, and lactate.

CONCLUSIONS

Therefore, the lactose ingestion could positively modulate the gut microbiota in healthy lactose tolerant adults promoting gut health, shedding light on the dietary benefits of consuming milk.

CONFLICTS OF INTERESTS

Employees of Lactalis Research and DevelopmentEmployees of Nintx

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SOAP07_14

IMPACT OF NON-NUTRITIVE SWEETENERS CONTENT IN JUICES ON CHILDREN

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BACKGROUND AND OBJECTIVES

Malnutrition due to excess in children is a multifactorial public health problem with a complex approach. Studies show that an inadequate food intake occurs mainly in the educational environment, where schoolchildren carry out their daily workday. In this context, in Chile the Law No. 20,606 (2016) was implemented, regulating the content of critical nutrients harmful to health (e.g. sugar) through front labeling. Consequently, the food industry has had to reformulate a large part of the food matrices, using non-nutritive sweeteners (NNS) instead to guarantee the sweet taste of packaged food products. However, recently the World Health Organization (2023) has suggested limiting the consumption of NNS due to the scarce evidence on its long-term benefits, especially its recommendation to avoid consumption in children. The objective of this research project is to analyze the content of NNS (sucralose and steviol glycosides) frequently consumed in juices from Chile (individual portion).

METHODS

This study was carried out through a descriptive cross-sectional design. The content of sucralose (SU) content and steviol glycosides (SG) was collected from nutritional labeling information of juices available from a Jumbo supermarket (Chile). The data was recorded using a database, specifying: brand, flavour, SU and SG content in one regular portion of consume (200 mL). Then it was calculated the acceptable daily intake (ADI) of SU and SG limits according FDA agency, and per average weight of children (6-10 years old) according The WHO Child Growth Standards.

RESULTS

Information was collected from the nutritional labeling of a total of 26 juices present on the shelves of a supermarket, which 60% of have at least SU or/and SG. The brands highlight for their high content: Valle” and “Vivo” with 40 mg and 35 mg of SU, respectively. While in content of SG, it spotlights the brands “Vivo” and “Watts” with 12 mg and 5 mg respectively. The highest content of SU and SG in juices was presented by 5 juices, obtaining 10,4 – 14,1 % of ADI children of 6 years old.

CONCLUSIONS

Among the juices studied, some presented a mixture of sweeteners. While a single serving does not pose a health risk to school children, indiscriminate consumption (several portions) of these juices together with other foods with sweeteners can represent a risk to children health.

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The authors have no conflict of interest.

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SOAP07_15

HEPATIC GENDER DIFFERENCES IN ONE CARBON AND CHOLINE METABOLISM DURING FASTING

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BACKGROUND AND OBJECTIVES

The liver plays a central role in metabolic homeostasis; however, sex chromosomes and hormones have been discussed to influence hepatic metabolism with gender-specific differences. Furthermore, research has shown sexual disparities in the development and prevalence of a variety of liver diseases, such as nonalcoholic fatty liver disease, and a disorder of one-carbon metabolism in this disease progression. This study aims to investigate the hepatic adaptive response to fasting, with a focus on one-carbon metabolism, to elucidate the molecular mechanisms of sexual disparities in disease progression.

METHODS

Eight-week-old C57BL/6 male and female mice were subjected to 48 hours of fasting. Liver tissue were subjected to whole transcriptome analysis by RNA-seq and metabolomics to access metabolite changes by the LC-MSMS method.

RESULTS

Transcriptome analysis identified hepatic 1,673 and 2,773 genes upregulated in male and female fasted mice, respectively. Among the identified genes, the gene group involved in one-carbon metabolism was regulated differently in a gender-specific manner. Next, choline metabolites, glycerophosphocholine (GPC), choline, and betaine levels were investigated, and notably, the GPC level decreased in males, resulting in a significant increase in choline levels to supply methyl groups for betaine synthesis and the methionine cycle. In contrast, GPC level increased in females while betaine level decreased. Furthermore, the mRNA level of GPC hydrolyzing enzyme, glycerophosphodiesterase 1 (Gpcpd1), is increased in males, demonstrating a gender-specific regulation of choline metabolism in response to fasting. The increased expression of Gpcpd1 in males is possibly related to an increased one-carbon metabolism for methylation processes, accompanied by active *S*-adenosylmethionine (SAM) consumption. However, in females, the Fgf21 level in the liver and the serum increased sevenfold compared to males, suggesting DNA hypomethylation in females. Taken together, our findings reveal distinct adaptive crosstalk between one-carbon metabolism and the Fgf21 pathway in response to fasting, which varies by gender.

CONCLUSIONS

This study identified Gpcpd1, a regulator of one-carbon metabolism, and Fgf21, a liver hormone, as drivers of sex differences in fasting-induced liver adaptation. These highlight the distinct hepatic responses related to gender that maintain metabolic homeostasis during fasting, paving the way for personalized, sex-specific nutritional approaches.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 13 - BASIC RESEARCH IN NUTRITION

SOAP13_02

THE RELATIVE VALIDITY OF 24-HOUR DIETARY RECALLS CONDUCTED VIA TELEPHONE AGAINST A 4-DAY FOOD RECORD TO ESTIMATE FOOD GROUP INTAKES IN A CONVENIENCE SAMPLE OF ADULTS IN IRELAND

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BACKGROUND AND OBJECTIVES

In Ireland, the National Adult Nutrition Survey (NANS) (2008-10) collected dietary data using a 4-day weighed food record(1), however, the more recent NANS II (2021-22) used 2x24hour dietary recalls(2) (via telephone due to the Covid-19 pandemic restrictions). The aim of this study was to investigate the relative validity of 2x24-hour dietary recalls (via telephone) against a 4-day weighed food record to estimate food group (FG) intakes in a convenience sample of adults to ascertain comparability between the two methods.

METHODS

Forty participants (19-64 years; 55% female) were equally randomised (to complete the food record first or to complete one dietary recall first, followed by the food record & 2nd dietary recall). Participants were trained in completing the food record using a food scales provided. The researcher-led 24-hour dietary recalls were conducted via telephone (at least 7 days apart) (with a photographic food atlas provided to participants). For both methods, there was a high level of researcher interaction (3 visits) with detailed dietary data collected at brand level. All foods/drinks consumed were mapped to one of 18 predefined FGs (with further disaggregated subgroups). FG intakes were estimated as mean daily intakes (g/d). Differences between METHODSwere assessed using a seven-criteria validity analysis(3).

RESULTS

The RESULTS indicated good/acceptable agreement between the two METHODSfor estimating FG intakes. Of the 18 predefined FGs, eight had all good/acceptable outcomes (‘bread/bread products’, ‘breakfast cereals’, ‘biscuits/ cakes/pastries’, ‘cheese’, ‘butter/spreads/oils’, ‘vegetables/vegetable dishes’, ‘meat/meat products’ & ‘soups/sauces/misc. foods’), seven FGs had 6/7 good/acceptable outcomes (‘grains/rice/pasta/savouries’, ‘milk/yogurt’, ‘eggs/egg dishes’, ‘potatoes/potato products’, ‘fruit/fruit juices’, ‘fish/fish dishes’ & ‘beverages’) while three FGs had 5/7 good/acceptable outcomes (‘creams/ice-creams/chilled desserts’, ‘sugars/confectionery/preserves/savoury snacks’ & 'nuts/seeds'). Disaggregation of FGs into subgroups generally resulted in a similar/higher number of good/acceptable outcomes except for ‘other savouries’, ‘boiled/baked/mashed potatoes’ & ‘fish discrete’ which had just 4/7 good/acceptable outcomes from the seven-criteria validity analysis.

CONCLUSIONS

These findings suggest that 2x24-hour dietary recalls (via telephone) may be comparable with a 4-day weighed food record for estimating FG intakes in adults. However, the protocols employed in this study (high researcher involvement, brand level data & gold standard food quantification methods) are important for accuracy and may have improved comparability.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP13_03

MINDFUL EATING AND PERCEIVED STRESS: INSIGHTS FROM AN ADULT POPULATION STUDY

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BACKGROUND AND OBJECTIVES

Mindful eating is characterized by heightened awareness of physical and psychological hunger and satiety signals, promoting healthier eating behaviors. It is hypothesized to aid in the development of sustainable dietary habits and support body weight management. Additionally, stress and body weight are believed to be related. This study aimed to evaluate the levels of mindful eating and perceived stress among adults.

METHODS

The study was conducted as an online survey between September and November 2024, targeting adults aged 18–65 years. Data were collected through a structured questionnaire encompassing sociodemographic characteristics, dietary habits, body weight, and height. Mindful eating was assessed using the Mindful Eating Inventory, while stress levels were measured via the Perceived Stress Scale.

RESULTS

A total of 200 participants were enrolled, of whom 73.5% were female and 80% were single. The mean mindful eating score was 3.56±0.42, while the mean perceived stress score was 2.92±0.47. Females had significantly higher stress scores (3.04±0.43) compared to males (2.78±0.54) ($p=0.003$). However, no significant association was observed between gender and mindful eating scores. Single (3.03±0.44) participants had higher stress scores than married (2.73±0.53) participants ($p=0.002$), although there was no significant relationship between mindful eating and marital status. Participants with a body mass index (BMI) over 30 had the lowest stress scores ($p=0.005$), and mindful eating scores ($p>0.05$). While mindful eating scores were negatively correlated with stress scores, this relationship was not significant ($r=-0.120$; $p=0.091$).

CONCLUSIONS

Stress levels were influenced by gender and marital status, while mindful eating showed no significant associations. Interestingly, higher BMI was associated with lower stress levels. These findings emphasize the need for more comprehensive research to explore the interplay between stress, mindful eating, and body weight in promoting sustainable dietary and psychological well-being.

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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP13_04

MALNUTRITION INDICATORS AND NUTRITIONAL FACTORS INFLUENCING FRAILTY IN MALAYSIAN OLDER ADULTS

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BACKGROUND AND OBJECTIVES

Frailty, a condition that increases vulnerability to health-related negative events, is particularly significant among older adults when faced with internal or external stressors. Despite its importance, the role of malnutrition indicators and nutritional determinants in frailty remains underexplored. This study addresses this critical gap by investigating the nutritional factors linked to frailty among community-dwelling older adults in Malaysia.

METHODS

This cross-sectional study included 1000 older adults aged >60 years old and interviewed for sociodemographics, health status, depression, functional performance, food intake using a structured dietary history questionnaire, activity lifestyle, and disability. Anthropometric and frailty assessments based on Fried's criteria were assessed. The predictive value of malnutrition indicator and nutritional factors was evaluated using binary logistic regression (BLR) in SPSS software.

RESULTS

Of the participants, 13.9%, 72.5%, and 13.6% were categorised as robust, pre-frail and frail, respectively. Participants with obesity (Adj OR=3.219; 95% CI: 1.415–7.324; $p<0.05$) and high waist circumference (Adj OR=1.032; 95% CI: 1.006–1.058; $p<0.05$) had a higher risk of frailty after controlling for confounding factors. Low intake of energy (Adj OR = 0.971; 95% CI: 0.948–0.995; $p<0.05$), protein (Adj OR=0.987; 95% CI: 0.976–0.998; $p<0.05$), carbohydrate (Adj OR = 0.976; 95% CI: 0.963–0.990; $p<0.05$), fibre (Adj OR=0.884; 95% CI: 0.794–0.985; $p<0.05$) and riboflavin (Adj OR=0.239; 95% CI: 0.091–0.630; $p<0.05$) increased the risk of frailty.

CONCLUSIONS

This study indicates that older adults with abdominal obesity and who had a lower intake of energy, carbohydrate, and fibre are at higher risk of frailty. These findings highlight the need for targeted nutritional interventions and obesity management strategies to prevent frailty, emphasizing the importance of promoting balanced diets while addressing abdominal obesity to support healthy aging in older populations.

CONFLICTS OF INTERESTS

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SOAP13_05

COMPARATIVE IN VIVO AND IN VITRO PROTEIN AND AMINO ACID DIGESTIBILITY FOR DIFFERENT PLANT-BASED FOODS AND INGREDIENTS

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BACKGROUND AND OBJECTIVES
Protein nutritional quality refers to the ability of dietary proteins to fulfil the amino acid requirements of the human body. Research protocols currently recommended to determine the digestible amino acid score (DIAAS) require human or animal studies. The METHODSbased on ileal digestibility in humans or pigs are the reference in protein quality evaluation, but they are affected by ethical limitations. Therefore, there is interest in the development of rapid and reproducible *in vitro* METHODSto evaluate protein digestibility. In this context, the aim of this work was to determine the *in vitro* protein and amino acid digestibility of foods and protein ingredients and to compare RESULTS with the standardized ileal digestibility values determined in ileal-cannulated growing pigs.
METHODS

An *in vitro* method based on the internationally harmonized protocol INFOGEST (Sousa et al., 2023) was used to digest 16 foods and protein concentrates with previously measured protein and amino acid digestibility in ileal cannulated pigs. The digestible and non-digestible fraction were determined by precipitation with MeOH.

RESULTS

The *in vitro* protocol provided comparable crude protein digestibility values (differences ≤ 5 %) to *in vivo* data except for rapeseed protein isolate, which contained trypsin inhibitors, corn flakes, whole meal bread, and wheat bagel. The discrepancy in the wheat-based products was attributed to the different matrix tested *in vivo* (fresh product) and *in vitro* (freeze-dried powder), resulting in a greater protein digestibility of the latter form. *In vitro* amino acid digestibility was also similar to *in vivo* values, and observed differences were ascribed to the analytical procedure, e.g. total lysine *vs* reactive lysine determination.

CONCLUSIONS

The *in vitro* digestion protocol reproduced to a good extent the in vivo protein and amino acid digestibility determined in ileal cannulated pigs except for samples containing trypsin inhibitors, indicating that the *in vitro* method was less sensitive to antinutritional factors. In comparative studies, it is important to evaluate digestibility of identical food matrices, since mild treatments, such as freeze drying, can affect protein digestibility, as occurred in the cereal products.

CONFLICTS OF INTERESTS
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SOAP13_07

THE ROLE OF PECTIN IN MODULATING BETA-CAROTENE BIOACCESSIBILITY UNDER VARIOUS GASTROINTESTINAL DIGESTION CONDITIONS

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BACKGROUND AND OBJECTIVES

Carotenoids are naturally occurring lipophilic phytochemicals. Their health benefits [1] and low bioavailability have sparked interest in understanding the factors and interactions that influence their absorption. Some dietary fibers have been shown to have inhibitory effects on carotenoid bioavailability [2].They may inhibit carotenoid bioaccessibility by inhibiting enzymes, binding occluding carotenoids, or bile salts, changing physico-chemical aspects such as viscosity and surface tension during digestion [3]. In this study, we investigated the impact of pectin on β-carotene bioaccessibility under various gastrointestinal conditions.

METHODS

β-Carotene bioaccessibility was assessed by the INFOGEST static in vitro gastrointestinal digestion model with slightly modified gastrointestinal digestion conditions. Combinations of pancreatin/bile were employed to achieve various ratios of 100 U/mL (pancreatin) with 3.4 mg/mL (bile extract, suboptimal digestive conditions), 200 U/mL with 6.8 mg/mL (physiological digestive conditions), and 300 U/mL with 10.3 mg/mL (high enzyme levels). Shear forces (100 vs. 140 RPM of the water bath) were modified. All conditions were also tested with the addition of glass beads to evaluate the effects of additional sheer forces on micellization in the presence and absence of pectin. The samples were tested for bioaccessibility along with various physico-chemical properties.

RESULTS

Overall, pectin reduced β-carotene bioaccessibility from 29.9±10.8% to 24.0±7.6% ($p<0.001$), pooling all other factors. Enzyme concentration significantly impacted bioaccessibility, with the lowest observed at 23.1±7.2% under incomplete digestive conditions (low bile/pancreatin), compared to 33.6±11.1% under physiological enzyme conditions and 27.3±9.1% at high enzyme levels. Glassbeads increased bioaccessibility from 25.5±8.6% to 30.0±11.09% ($p < 0.001$). Interestingly, increasing RPM from 100 to 140 reduced bioaccessibility from 30.0±9.4% to 24.7±9.8% ($p < 0.001$).

CONCLUSIONS

Pectin's impact varied with digestive conditions, with bioaccessibility being lowest under marginal enzyme conditions, 140 RPM, and with the presence of glass beads/additional sheer forces, 14.9±1.9%, and highest under physiological enzyme conditions, 140 RPM, and no glass beads, 33.1±6.0%.The findings highlight the variability of carotenoid-fiber interactions depending on gastro-intestinal digestions conditions, which could be relevant for persons with digestion disorders such as irritable bowel syndrome.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP13_08

ABSORPTION, UTILIZATION AND METABOLIC MECHANISM OF SIALYLLACTOSE, A HUMAN MILK OLIGOSACCHARIDE

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BACKGROUND AND OBJECTIVES

The predominant sialylated human milk oligosaccharides (HMOs) are 6'sialyllactose (6'SL) and 3'sialyllactose (3'SL). In early human milk (0-3 month), the 6'SL concentration is 2-3 times higher than 3'SL (1,2). Sialic acid is a key a component of SL playing many critical roles to strengthen the infant immune function and neurodevelopment (3). Despite this important role, the absorption, transportation and utilization of sialyllactose (SL), and the underlying mechanisms of metabolism in living organisms, remain largely unknown. There is no information on whether these processes differ between 3'SL and 6'SL and why the concentration of 6'SL in early human milk is higher than that of 3'SL.

METHODS

We explored the absorption, transport and metabolic fate of exogenous 6'SL in weaning mice using in vivo and ex vivo optical/fluorescence imaging (Cy7 labeled 6'SL) and stable isotope-labeled 13C-6'SL. We compared the differences in metabolism and mechmisims between 6'SL and 3'SL in weaning mice and neuronal cell cultures. The experimental protocol was approved by the Animal Ethic Committee of Beijing Association for Science and Technology (License No. SYXK-2019-0004).

RESULTS

Orally administered labelled 6'SL-Cy7 reached the brain intact within 0.5 h, with a cumulative amount of ~0.3% of the oral dose in female weaning mice, and 1.54% in male weaning mice. This was followed by a sharp decline by 1.5 h with about 0.05% of the oral dose of 6'SL-Cy7 retained at 12 h. Since the colon show no 6'SL cumulation within 30 minutes, the intact oral 6'SL crossing the BBB during this time is independent of colonic fermentation.

A stable isotope-labelled 13C-6'SL can cross the BBB in weaning mice. About 0.25% of intact 13C-6'SL was detected in the brain 1 h after oral administration. Most of this remained in the brain at 3 h (66%), but very little was present at 6 h (0.01%).

Dietary sources of 6'SL is primary donor of Sia, which directly promotes the synthesis of polysialic acid (polySia) and gangliosides in neuronal cells of brain, thereby promoting neurodevelopment.

CONCLUSIONS

Intact oral 6'-SL rapidly crosses the BBB, acting as a primary sialic acid donor that enhances polySia and ganglioside expression in neuronal cells, promoting neurodevelopment in weaning mice independently of colonic fermentation. Its metabolic process is more effective than that of 3'-SL. These findings are novel and previously undescribed.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP13_10

EVALUATING THE PROTECTIVE ROLE OF FISH OIL AGAINST CHRONIC ALCOHOL-INDUCED BRAIN DAMAGE

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BACKGROUND AND OBJECTIVES

Chronic alcohol abuse leads to extensive systemic harm. In addition to hepatic damage due to the metabolism process, excessive consumption of alcohol significantly raises the risk of developing dementia. One of the major causes of alcohol related brain damage (ARBD) is oxidative stress. As key regulator of antioxidant system, Nrf2 activates transcription of antioxidant genes such as NAD(P)H-quinone oxidoreductase 1 (NQO1) and heme oxygenase-1 (HMOX1), while enhancing glutathione, superoxide dismutase and catalase. GSK3β has been identified as the proposed communicator to Tauopathies, prolonged binge drinking exacerbates tau pathology, leading to neurodegeneration. Recent research indicates omega-3 fatty acids can balance cellular redox via NRF2. Fish oil, abundant in omega-3 fatty acids, is well studied for its antioxidant and anti-inflammatory protections. Our previous studies elaborated its protective effect against alcoholic liver disease. Therefore, this study aims to evaluate the protective effects of fish oil on ARBD.

METHODS

Male Wistar rats were fed either a control liquid diet (C) or the Lieber-Decarli alcohol diet (E), with 25% or 57% of fish oil substituted (F25 and F57, respectively) for 8 weeks.

RESULTS

After 8 weeks, the liver damage parameters, including plasma AST, ALT activities, hepatic lipids accumulation, and inflammation scores, were elevated in the E group, while EF25 and EF57 ameliorated these effects. Histopathological analysis using H&E staining revealed more condensed pyramidal cells in the hippocampus of the E group, whereas the EF25 and EF57 groups exhibited reduced damage. Increased GFAP and Iba-1 expression were observed in E group, while EF25 and EF57 showed less. Additionally, spatial memory, assessed by the spontaneous Y-maze test, was impaired in the E group. Phosphorylated NRF2 protein expression, mRNA expression of NQO1 and activities of antioxidant enzymes in prefrontal cortex were suppressed in E group. However, phosphorylated Tau (Thr231) remained unchanged in this study. Other phosphorylation sites should be explored in future study.

CONCLUSIONS

These findings suggest that chronic alcohol consumption impairs the brain with spatial memory function loss. Fish oil may offer protection against alcohol-induced damage by preserving hippocampus integrity. The modulation of NRF2 activation and tau phosphorylation should continue to be explored.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP13_11

INVESTIGATING THE ROLE OF PEANUT CONSUMPTION IN ANTHROPOMETRIC PARAMETERS IN PREADOLESCENTS

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BACKGROUND AND OBJECTIVES

Although peanuts are a high-calorie food, several studies have highlighted their beneficial effects due to their rich profiles of fatty acids, proteins, fiber, vitamins, minerals, and bioactive compounds with potential antioxidant properties, as well as their high satiety value. However, the impact of peanut consumption on anthropometric parameters in preadolescents has not been fully explored. This study aims to investigate the effects of daily peanut consumption on weight management in preadolescents.

METHODS

A two-arm parallel cluster-randomized controlled trial was conducted with 83 healthy preadolescents in Barcelona. Schools were randomly assigned to intervention or control group and both arms received an educational intervention designed to promote healthy dietary habits. The intervention group consumed 25g of whole skin roasted peanuts for six months. Anthropometric and adiposity measurements, were taken during baseline, follow-up and final visits.

RESULTS

The findings revealed significant differences between the two groups at six months of the intervention (p=0.01). A significant increase in body weight (p=0.01) and body fat (p=0.02), as well as a significant decrease in muscle mass (p=0.024), was observed in the control group; however, these adverse effects were not observed in the intervention group. Moreover, waist circumference, an indicator of adiposity, showed a significant increase in the control group after six months (p=0.01). In contrast, this increase was not observed in the intervention group, which displayed a marked difference compared to the control group at six months (p=0.001).

Regarding the BMI z-score, adjusted for age and sex, there was a trend towards improvement in the intervention group, but it was not significant (p=0.07). In terms of peanut consumption, a significant difference was observed at 6 months (p=0.01). Additionally, the KIDMED questionnaire on adherence to the Mediterranean diet showed a significant decrease in scores in the control group at 6 months, with a significant difference between groups (p=0.03). This trend was not observed in the intervention group, where adherence remained the same or even improved in the girls.

CONCLUSIONS

Daily peanut consumption was associated with a smaller increase in body fat and less muscle mass loss compared to the control group. These RESULTS suggest that peanuts may positively influence weight management in preadolescents.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP13_12

INTESTINAL FUNCTION MODULATION OF DAIRY PHOSPHOLIPID BY-PRODUCTS FOLLOWING IN VITRO STATIC DIGESTION

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BACKGROUND AND OBJECTIVES

The gut barrier plays an important role in human health. Milk is naturally rich in many active constituents that contribute to beneficial functions. Some dairy by-products providing milk fat globule membrane (MFGM) could modulate intestinal digestive, barrier, endocrine and immune functions. We previously demonstrated in vitro the benefits of dairy ingredients providing MFGM on gut physiology, both in basal and inflammation states. Our objective was to further decipher their effects in an experimental protocol approaching better the intestinal physiology i.e. after incorporation in a food matrix model and in vitro static digestion.

METHODS

Three dairy ingredients were used: Buttermilk, a natural source of MFGM, and MFGM-Buttermilk and MFGM-Whey, two MFGM-enriched ingredients. They were studied using an in vitro model of the human intestinal epithelium, in an inflammatory state that mimicks the one encountered in elderly. Ingredients, studied either alone or incorporated in a dairy drink, were subjected to a first step of in vitro static digestion prior to evaluate their impact on a quadricellular model of intestinal epithelium. When studied alone, MFGM-enriched ingredients were standardized at 0.15 mg/mL phospholipids whereas buttermilk was used at a lower concentration of PL (0.031 mg/mL) to investigate dose-dependent effects. Due to solubility issues, phospholipid concentration was lower when using the dairy drink model (0.045 mg/mL and 0.009 mg/mL respectively). Digestion was adapted from the INFOGEST 2.0 protocol. Inflammation was induced using TNFα. Cytoxicity was evaluated by lactate-dehydrogenase release and barrier integrity by trans-epithelial electrical resistance. Expression of genes of interest was quantified by RT-qPCR using a SmartChip device.

RESULTS

All MFGM-ingredients had no effect on cytotoxicity. The digestion fluid alone (i.e. 1/40 diluted product of the digestion protocol without ingredient) impaired gut barrier integrity, which was restored by MFGM-ingredients.

A MFGM-dose dependent effect on cell viability was observed when MFGM-ingredients were incorporated in the dairy drinks, with a significant higher cell viability for MFGM-enriched ingredients than for Buttermilk. Multivariate analysis including gene expressions is underway to better characterize the underlying mechanisms and investigate intestinal functions.

CONCLUSIONS

These RESULTS add to the body of evidence of MFGM benefits especially in intestinal disorders which could occur for the elderly.

CONFLICTS OF INTERESTS

Marion Lemaire, Benjamin Choque, Julie Pourprix and Eléonore Lepvrier are current employees of Sodiaal Group. Gwenal Broudic was an employee of Sodiaal Group at the time of the study.

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SOAP13_13

REIMAGINING ANTHROPOMETRIC MEASUREMENTS: AI-POWERED HEIGHT PREDICTION AND MALNUTRITION CLASSIFICATION – A PILOT STUDY IN NEPAL

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BACKGROUND AND OBJECTIVES
Accurate anthropometric measurements are critical for monitoring child growth and identifying malnutrition. With traditional METHODSdemonstrating significant limitations, emerging technologies, like AI, show promise for more reliable and accurate solutions. Deutsche Welthungerhilfe e.V. (WHH) developed a smartphone-based AI application, the Child Growth Monitor (CGM). In March 2023, WHH conducted a study together with FORWARD Nepal, to evaluate CGM's potential to accurately assess children's height and screen for stunting and wasting status. The study aimed to assess CGM's accuracy as a height measurement, and as a stunting and wasting screening tool (utilizing manual weight) for children aged 24-59 months in the community setting.
METHODS

Data from 292 children aged 24-59 months was collected in March 2023. Village Health Volunteers (VHV) collected manual anthropometric measurements, and enumerators, trained using SMART methodology, collected expert manual measurements and CGM scans with the smartphone. The performance of the CGM application was assessed by comparing height measurement and stunting and wasting classification metrics derived from scan-based data to those from VHV measurements, with enumerator's measurements being the reference.

RESULTS
The height accuracy comparison revealed that the scan-predicted measurement consistently outperformed the VHV manual measurement, and the screening RESULTS across all evaluated metrics, with a significantly lower Mean Absolute Error (MAE) (0.9194cm) compared to VHV (2.025cm). The stunting screening RESULTS analysis demonstrated that the CGM scans outperformed VHV manual measurements across all key metrics. The combination of scan-predicted height and VHV manual weight offers comparable overall accuracy (84.59%) and significantly higher sensitivity for "Moderately Wasted" (43.18%) and "Severely Wasted" (50%).Full data: https://cgmiunsheightprediction.z29.web.core.windows.net/
CONCLUSIONS

CGM demonstrated at par or superior performance compared to VHV measurements. Combined with the aspect of portability and faster, more straightforward training for users, it shows the potential of using new technology for performing anthropometric measurements. Health care workers find their jobs easier, leading to positive feedback and high acceptance rates among caregivers. Further research is needed to explore CGM's performance for children <2 years and performing training of algorithms on different ethnicities.

CONFLICTS OF INTERESTS
Dr. Anupama Vadyadagaya and Ankit Gupta are in a paid contractual relationship with Deutsche Welthungerhilfe e.V. as consultants for the Child Growth Monitor Project.

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SOAP13_14

EFFECTS OF LUPIN SEEDS CONSUMPTION ON METABOLIC MARKERS IN HEALTHY SUBJECTS

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BACKGROUND AND OBJECTIVES

Cardiovascular diseases (CVDs) are among the leading causes of death worldwide, with dyslipidemia and chronic inflammation as major risk factors [1]. Diet plays a key role in modulating these factors, and legumes, among which lupins, are rich sources of vegetable proteins, fiber and bioactive compounds that may positively affect lipid profiles and inflammation [2]. Despite promising preclinical evidence, mainly on lupin isolates or protein fractions, human studies evaluating the metabolic and anti-inflammatory effects of lupin consumption are limited. With these presumptions, a randomized controlled trial (RCT) has been designed to analyze the effect of chronic lupin consumption on lipid metabolism markers and the potential anti-inflammatory role in healthy volunteers.

METHODS

Healthy adult volunteers (BMI 18–35 kg/m², 25-55 yo), consuming >6 servings of meat/processed meat/cheese, were recruited for a 4-week parallel RCT. In the frame of their habitual diet and lifestyle, participants were randomly assigned to: i) intervention group (INT), 600 g lupins/week and refrain from at least two servings of meat/processed meat/cheese; ii) control group (CTR), 30 g lupins/week. Lupins were provided by the Italian company Madama Oliva SpA. The primary endpoint was the change in triglyceride levels from baseline, secondary ones were anthropometrics and blood pressure, glycaemic, lipidic and inflammatory markers, as well as antioxidant parameters.

RESULTS

Fifty-two healthy participants (24 CTR and 28 INT) concluded the study. Mean age was 33±1 and 37±2 years for CTR and INT respectively, BMI 23.3 and 25.0 kg/m², respectively. All baseline parameters were not significantly different between the two groups. After 4-week trial, a significant improvement in total cholesterol levels (155±9.1 mg/dL vs. 189±7.5 mg/dL, respectively) and LDL-cholesterol levels (84±7.4 mg/dL vs. 119±7.1 mg/dL, respectively) was observed within the INT between females and males. A significant difference in total cholesterol delta values (Δ = -11.79±3.2 mg/dL vs. -2.79±2.4 mg/dL, respectively) and LDL cholesterol (Δ = -6.75±2.4 mg/dL vs. 1.31±1.6 mg/dL, respectively) was also observed between the INT and CTR.

CONCLUSIONS

The abundant consumption of lupin seeds, in the frame of the habitual diet, significantly improved blood cholesterol-related markers in healthy adults. Funding: Italian Ministry of Economical Development, 02/UNITE-MAD.OL 30/11/2021, CUP C47B220001100008.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP13_15

ASSESSING THE STABILITY OF DIETARY DERIVED MICRORNAS AS NOVEL FOOD BIOACTIVES AND BIOMARKERS OF INTAKE

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BACKGROUND AND OBJECTIVES

Dietary derived miRNAs have emerged in recent years as novel food bioactives that can be detected in bodily compartments after ingestion (1), with a potential to act as both biomarkers of intake and biomarkers of effect (2). Nevertheless, the study of miRNA stability during digestion are still unknown. In the same regard, little is known about the role of exosomes in the delivery and uptake of these miRNAs (3). We have studied the stability of dietary derived miRNAs during gastrointestinal digestion, including different digestive conditions and the effect of the food matrix and exosomes on their stability.

METHODS

Using a silica-based column, we have extracted plant-derived miRNAs from gastrointestinal digesta derived from the static INFOGEST model. Later, RT-qPCR was used to study the survival of dietary derived miRNAs (bol-mir-172a; bol-mir-156, bol-mir-1030, bol-mir-164b) before and after digestion, as well as during incubation at higher temperatures to simulate cooking (T= 100ºC, t=20 minutes). Furthermore, we have tested the effect of different food matrices (solid food vs puree) and digestive conditions (i.e. pH value in the gastric phase at 3 and 4; different concentrations of pancreatin, bile salts, and pepsin tested simulating mild, normal, or more rigorous digestion conditions).

RESULTS

Our findings indicate that there was a significant degradation of microRNAs during cooking (thermal incubation) ($P>0.01$). Nonetheless, the biggest challenge for miRNA survival was gastrointestinal digestion, with a reduction in the concentration of eight orders of magnitude, from an average concentration (miRNA copies/mg vegetable) of 1E10 to 5E2 ($p>0.01$). In this regard, we also intend to compare the effect of enzymatic concentration and pH during digestion upon miRNA concentration. Furthermore, due to large differences in stability between the cauliflower and the free spiked miRNA, we have observed that the food matrix plays an important role in the stability of miRNAs.

CONCLUSIONS

Our research has shown that dietary derived miRNAs can survive gastrointestinal digestion and reach concentrations of 1*106 copies/ml in the bioaccessible fraction under physiological plausible conditions. These RESULTS indicate that dietary derived miRNAs may reach the gut epithelia at concentrations high enough to exert bioactive effects in humans. In the following, we will continue to evaluate this hypothesis via studying the cellular uptake and transport of miRNAs, as well as potential targets within the human genome.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP13_16

INFLUENCE OF PATERNAL DIET ON OFFSPRING METABOLIC HEALTH USING DIET INDUCE OBESE MICE

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BACKGROUND AND OBJECTIVES

Paternal obesity is a significant risk factor for obesity and related metabolic disorders in offspring. While n-3 omega polyunsaturated fatty acids (PUFAs) have demonstrated efficacy in mitigating the negative effects of maternal obesity and improving offspring health, the effects of paternal n-3 PUFA intake and the underlying epigenetic mechanisms in improving offspring health remain unclear. Therefore, we investigated the preconceptional influence of paternal n-3 PUFA intake on offspring metabolic health, with a focus on potential sex-based disparities.

METHODS

We employed a mouse model to examine the preconceptional influence of n-3 PUFA intake in male mice on offspring metabolic health. Male mice were allocated to one of three dietary groups: low-fat (LF), high-fat (HF), or HF supplemented with fish oil (FO) for ten weeks before mating with LF-fed females. Offspring were further divided into six groups based on their paternal diet and post-weaning diet (LF or HF). Glucose and insulin tolerance tests were conducted to assess metabolic function and markers of obesity were measured in muscle and liver.

RESULTS

Our findings revealed a sex-dependent response to paternal n-3 PUFA intake. Offspring born to FO sires exhibited lower body weight at early postnatal stages (7 and 21 days) compared to those with HF sires, despite no significant difference in paternal body weight across groups. Notably, FO-HF females demonstrated enhanced glucose clearance and improved insulin sensitivity compared to HF-HF females. These RESULTS suggest that paternal n-3 PUFA consumption may program early metabolic adaptations in female offspring, potentially enhancing their ability to handle glucose and insulin even under obesogenic conditions. Interestingly, no such effect was observed in male offspring. In conclusion, this preliminary data highlights potential sex-specific programming effects of paternal n-3 PUFA intake on offspring metabolism. These findings contribute to our understanding of the intricate interplay between parental diet and offspring health. Further investigations into the underlying genetic mechanisms are underway to elucidate the molecular basis for these sex-dimorphic responses and their potential implications for chronic disease prevention strategies.

CONCLUSIONS

This research paves the way for the development of more comprehensive approaches to combatting chronic diseases that consider the contributions of both parents.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 40 - BASIC RESEARCH IN NUTRITION

SOAP40_04

INTERVENTION PRIORITISATION OF IMPROVING THE SCHOOL FOOD ENVIRONMENT IN SOUTH AFRICA: CO-DEVELOPED INTERVENTIONS

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BACKGROUND AND OBJECTIVES

As part of UNICEF's blueprint to enhance the school food environment (SFE) in South Africa to improve learner health outcomes, this study employed a systematic intervention mapping approach to identify and prioritise sustainable, inclusive interventions based on the qualitative baseline stakeholder findings of the South African SFE. This study aimed to co-develop actionable interventions to foster a healthier SFE in South Africa.

METHODS

Evidence-based interventions that have improved the SFE were identified through systematic reviews and the NOURISHING database, addressing the barriers and facilitators of the South African SFE from the baseline findings. A Delphi process, conducted over three survey rounds, engaged diverse stakeholders, including principals, teachers, school management teams, governing bodies, parents, learners, vendors, and the Department of Education. In Round 1, stakeholders rated interventions on importance and feasibility using a 5-point Likert scale. High-priority interventions (median 4–5; quartile deviation [QD] < 1) advanced to Round 2 for re-evaluation. By Round 3, interventions achieving strong consensus (median 4–5; QD ≤ 0.5) were finalised. A reference group comprising the National School Nutrition Programme (NSNP) implementers, academia and government stakeholders further refined the list based on the feasibility of implementation.

RESULTS

The Delphi process reduced 31 initial interventions to 25 in Round 2 and 18 in Round 3. The reference group prioritised seven key interventions to improve the SFE in South Africa according to feasibility and costs: 1. Regulation and monitoring of food and beverage sales at school tuckshops. 2. Campaign to promote healthy eating and physical activity among learners. 3. Enhancements to the NSNP to diversify menus and improve meal quality, service, and facilities. 4. Alignment of donations and sponsorships with healthy SFE objectives. 5. Regulations to prohibit unhealthy food marketing and advertising in and around schools. 6. Stakeholder training to improve the SFE. 7. Partnerships with informal vendors to include healthy food and beverage options while maintaining profitability.

CONCLUSIONS

A multi-stakeholder approach identified feasible interventions to improve the SFE in South Africa, for the purposes of piloting the interventions at six public schools in South Africa.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP40_05

SYNERGISTIC EFFECTS OF PREBIOTIC FRUCTOOLIGOSACCHARIDES AND VIGABATRIN ON EPILEPSY THERAPY USING A PTZ-KINDLED MOUSE MODEL

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BACKGROUND AND OBJECTIVES

Epilepsy is a neurological disorder characterized by unprovoked seizures due to an imbalance between neuronal excitation and inhibition. To rectify this imbalance, enhancing levels or inhibitory signals of gamma-aminobutyric acid (GABA), the principal inhibitory neurotransmitter, is crucial. For instance, vigabatrin, a well-known antiseizure drug (AED), suppresses seizures by inhibiting GABA degradation, raising brain GABA levels. In addition to AEDs, prebiotics have been shown to alleviate epilepsy. However, research on combining prebiotics with AEDs is limited. Thus, this study explored the synergistic effects of the prebiotic fructo-oligosaccharides (FOS) and the AED vigabatrin on seizure suppression.

METHODS

Male 8-week-old ICR mice were kindled through chronic administration of pentylenetetrazol (PTZ; 35 mg/kg) over 7 weeks. Three weeks before full kindling, mice were assigned to a control or 10% FOS diet. At week 7, the fully kindled mice in each diet group were divided into subgroups (n = 6-7) receiving daily PBS (control) or vigabatrin (250 mg/kg) injections. During vigabatrin treatment, PTZ (35 mg/kg) was administered every 3 days to assess the effects of FOS and vigabatrin on seizure severity. On day 15, when seizures significantly decreased in the FOS-vigabatrin group, PTZ administration was stopped, followed by the T-maze test. After 24 h, mice were euthanized, and blood and tissues were collected.

RESULTS

By day 9 of vigabatrin treatment, mice receiving the FOS-vigabatrin combination showed a significant decrease in seizure scores, whereas those given FOS or vigabatrin alone did not. This suppressive effect persisted through day 15. In the T-maze test, the FOS-vigabatrin group showed a significantly higher alternation percentage (p = 0.0099 vs. PTZ mice), similar to healthy naïve mice, while FOS or vigabatrin alone resulted in slight, non-significant improvement. Both FOS alone and the FOS-vigabatrin combination increased cecal weight and gut GABA levels. In the hippocampus, vigabatrin and the FOS-vigabatrin combination significantly reduced the glutamic acid/GABA ratio and increased homocarnosine levels. The FOS-vigabatrin combination had a stronger effect on increasing this brain-specific, GABA-containing dipeptide homocarnosine compared to vigabatrin alone.

CONCLUSIONS

This study suggests that FOS and vigabatrin synergistically suppress seizures and improve spatial memory, possibly by decreasing the glutamic acid/GABA ratio and increasing homocarnosine levels.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP40_06

INITIAL INFANT FEEDING, SALIVA 1,5 ANHYDROGLUCITROL, AND 6-MONTH WEIGHT GAIN

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BACKGROUND AND OBJECTIVES

Early infant feeding and infant weight gain can impact the development of chronic diseases. 1,5 anhydroglucitrol (1,5-AG), is a measure of hyperglycemic excursions (HEs) in the preceding 10-14 days but research is limited in infants. Saliva 1,5-AG levels decrease during HEs due to increased urinary excretion. We examined associations between saliva 1,5-AG levels with primary feeding mode and early weight gain in U.S. infants.

METHODS

A subgroup of participants in an ongoing randomized controlled feeding trial (the MINT study) was selected. Saliva was collected from 128 infants at 5 months of age before they were randomized to introduce different complementary foods (CFs), and from 100 infants at 6 months of age to determine early changes in 1,5-AG after starting CFs. Demographics, anthropometrics, and feeding mode (exclusive breastfed (EBF), exclusive formula fed (EFF), mixed (MF)) were recorded at each time point. 1,5-AG analysis was conducted using LC/MS. Weight-for-age z-scores (WAZ) were calculated for birth and each time point. Rapid weight gain (RWG) was classified as $\geq$ 0.67 increase for WAZ from birth to 5 and 6 months.

RESULTS

Saliva 1,5-AG concentrations were negatively correlated with an increase WAZ at Months 5 and 6 ($r = -0.19$ and $r = -0.20$, $p < 0.05$), but Month 6 levels were not significantly correlated with an increase WAZ at Month 6 ($r = -0.13$, $p = 0.19$). 1,5-AG was significantly ($p < 0.001$) greater for EBF infants (1.28±1.08ug/ml) compared with EFF infants (0.23±0.18ug/ml) at 5 months. 1,5-AG levels were also significantly greater at 6 months for EBF infants (1.13±0.73ug/ml) compared with EFF infants (0.22±0.21ug/ml, $p < 0.001$) but not with MF infants at either time period. However, the coefficients for 1,5 AG levels with increase WAZ and RWG using multiple regression and logistic regression, respectively, were not significant when adjusting for WAZ at birth, sex, age, experimental group and feeding modality at 5 and 6 months of age. Additionally, the 1,5 AG concentrations were not significantly different between experimental groups at 6 months.

CONCLUSIONS

Saliva 1,5-AG suggests EBF infants have fewer HEs compared with other infants. Lower saliva 1,5 AG levels were associated with an increase in WAZ and RWG but not when adjusted for birthweight and other factors. Initiating CFs did not affect 1,5 AG levels. Additional analyses are needed to evaluate the impact HEs has on infant growth and health.

CONFLICTS OF INTERESTS
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SOAP40_07

HONEY AUTHENTICITY AND ADULTERATION IN THAILAND: A STABLE ISOTOPE ANALYSIS

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BACKGROUND AND OBJECTIVES

Honey, a valuable agricultural product, is widely produced in Thailand. Despite stringent quality control standards, concerns persist regarding honey adulteration with added sugars. This study aims to develop a robust method for detecting honey authenticity and adulteration using stable carbon isotope ratio analysis.

METHODS

Honey samples from various regions in Thailand were analyzed using Elemental Analyzer-Isotope Ratio Mass Spectrometry (EA-IRMS) and Cavity Ring-down Spectrometry (CRDS). Stable carbon isotope ratios ($\delta^{13}C$) of both honey and honey protein were determined, along with the analysis of various adulterated sugars.

RESULTS

Natural honey in Thailand typically exhibits $\delta^{13}C$ values below -23.5‰ VPDB, with a small difference between honey and honey protein. Adulteration with sugars, such as high fructose corn syrup, glucose syrup, and maltose syrup, significantly alters the $\delta^{13}C$ values and sugar profiles of honey. Adulteration detection is still limited if the adulteration concentration is lower than 5%, except for the samples mixed with high fructose syrup (55%).

CONCLUSIONS

By comparing the $\delta^{13}C$ values and sugar profiles of honey samples to established standards, this study demonstrates the potential of stable isotope analysis as a reliable tool for safeguarding honey authenticity and detecting adulteration. This study underscores the potential of stable isotope analysis as a robust tool for safeguarding honey authenticity and detecting adulteration, thereby protecting consumers and ensuring fair trade practices.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP40_08

NEUROPROTECTIVE EFFECTS AND MECHANISMS OF DIETARY BIOTIN IN MITIGATING DEMENTIA RISK

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BACKGROUND AND OBJECTIVES

Association between biotin and dementia were rarely discussed. This study endeavored to investigate the association and potential mechanisms in a population-based and animal-experimental study.

METHODS

For epidemiology, it was derived from UK Biobank, including 210864 participants. Time-dependent Cox model was used to estimate the hazard ratios (HRs) and 95% confidence intervals (CIs) for the association of dietary biotin with dementia risk. Linear regression models were employed to estimate the β coefficients and 95% CIs for associations of dietary biotin with volumetric alteration of brain structure. For animal experiment, it established a biotin deficiency mouse model by using a biotin completely deprived diet. After 9-week dietary intervention, biological experiments dot blot, immunofluorescence, real-time quantitative PCR (RT-qPCR), and molecular docking based on the structures were conducted.

RESULTS

For population study, moderate and high biotin intake were associated with decreased all-caused dementia risk (HR moderate = 0.76 [0.67-0.85]; HR high = 0.73 [0.63-0.83]). Dose-response association was observed, indicating that about 50μg intake of dietary biotin per day may bring lowest all-cause dementia risk. Meanwhile, dietary biotin significantly associated with altered volume of brain structure which highly correlated to the onset and progression of dementia. There exists positive relationship between dietary biotin and concentration of biotin in mice serum and specific locations of brain, such as the hippocampus and prefrontal cortex except the amygdala. Further detection of the transcription levels of dementia-related genes, amyloid precursor protein (APP), presenilin-1 (PSEN1), and apolipoprotein E (APOE) in subregions revealed that in the hippocampus and prefrontal cortex of biotin-deficient mice, the genes APP, PSEN1, and APOE were significantly upregulated, while there was no significant difference in the amygdala, which was consistent with the RESULTS of immunofluorescence. Subsequently, structure model suggested that biotin fell right in the position within the active pocket that was supposed to recognize and cleave β-amyloid (Aβ), thereby reducing the production of pathogenic deposits of Aβ. At the same time, biotin may affect the competitive binding of Aβ/APOE to Low density lipoprotein receptor-related protein 1 (LRP1), then altering the progression of dementia.

CONCLUSIONS

Dietary biotin serves as a defender against dementia, which may originate from the neuroprotection on reduction of accumulation of Aβ in specific regions in brain.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP40_10

EFFECTS OF EXOGENOUS NUCLEOTIDES ON INSULIN RESISTANCE IN THE ELDERLY: A SECONDARY ANALYSIS OF A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Aging impairs metabolic homeostasis, exacerbating insulin resistance and reducing quality of life in the elderly. This secondary analysis of a randomized controlled trial (RCT) examined the potential of exogenous nucleotides (NTs) to improve insulin resistance through metabolic and epigenetic mechanisms, offering insights for healthy aging.

METHODS

This was a 19-week, double-blind, randomized, placebo-controlled trial conducted in Chengdu, China, involving 121 elderly participants aged 60–70 years. Participants were randomly assigned in a 1:1 ratio to receive either NTs (1.2 g/day) or placebo, using a computer-generated randomization sequence. The trial is registered with ClinicalTrials.gov (NCT05243108). Data analyzed included: (1) glycolipid metabolic profiles (fasting glucose, glycated hemoglobin, fasting insulin, HOMA-IR, triglycerides, total cholesterol, LDL-C, HDL-C); (2) RNA sequencing (RNA-Seq) of fasting whole blood; and (3) whole-genome bisulfite sequencing (WGBS) of fasting venous blood clot.

RESULTS

NTs significantly improved insulin sensitivity in the elderly. Compared with the placebo group, HOMA-IR was reduced in the NTs group (β = -0.45, 95% CI: -0.86 to -0.04, $P = 0.033$), and fasting insulin levels also decreased significantly (β = -1.28, 95% CI: -2.30 to -0.26, $P = 0.014$). However, no significant differences were observed in fasting glucose, glycated hemoglobin, total cholesterol, triglycerides, HDL-C, or LDL-C ($P > 0.05$). Transcriptomic analysis revealed significant downregulation of nucleotide metabolism-related enzymatic processes (e.g., CTP, AMP, GMP synthesis) in the placebo group but not in the NTs group, suggesting NTs supplementation maintained metabolic function. WGBS analysis identified differentially methylated regions (DMRs) between the NTs and placebo groups post-intervention in the insulin signaling-related gene PRKAR1B (e.g., NC_000007.14_74827801_74828000), with the NTs group showing lower methylation levels and the placebo group exhibiting higher methylation. KEGG analysis suggested that reduced methylation of PRKAR1B might influence PKA activity, potentially optimizing the insulin signaling pathway.

CONCLUSIONS

This secondary analysis provides evidence that nucleotide supplementation improves insulin resistance in the elderly, potentially by maintaining nucleotide metabolism and modulating epigenetic mechanisms associated with the insulin signaling pathway.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP40_11

SPECIFIC PEPTIDES PRESENT IN HUMAN JEJUNUM AFTER MILK CONSUMPTION INDUCE GASTROINTESTINAL HORMONES IN ENTEROENDOCRINE CELLS

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BACKGROUND AND OBJECTIVES

Food proteins are recognized as one of the macronutrients with a higher impact on intestinal signalling for hormone secretion. We have previously shown that milk proteins after digestion notably induce the secretion of glucagon-like peptide-1 (GLP-1) and cholecystokinin (CCK) in enteroendocrine cell cultures and some protein domains are especially resistant to the action of gastrointestinal enzymes and can reach distal regions of the gastrointestinal tract. The objective of this work was to screen the *in vivo* resistant peptides after milk proteins consumption as hormone inducers and examine the role of the aminopeptidase dipeptidyl peptidase-IV (DPP-IV) inhibition on their inducing activity.

METHODS

A selection of sequences previously identified in the human jejunum aspirates after ingestion of whey or casein were synthesized and assayed for their GLP-1 and CCK inducing potency in the mouse enteroendocrine cell line STC-1. The inhibition of the DPP-IV of the peptides was determined in Caco-2 cells.

RESULTS

The assayed sequences elicited the release of CCK and GLP-1 to different extents, the most prominent inducers for CCK being from two β-casein domains, and one from β-lactoglobulin. For GLP-1, particularly potent induction was found for selected fragments from β-lactoglobulin. The effect of the amino acids was evidenced. Thus, the successive removal of the N-terminal amino acids of peptide LNVPGEIVE decreased stepwise the CCK secretion, but kept the GLP-1 release. In other sequences, such as VYPFPGPIPN, the sequence shortening increased the hormonal secretion up to different fragments, i. e. YPFPGPI for maximum CCK or YPFPG for GLP-1 release. Some small-size fragments from very active sequences loosed the activity. From these peptides, four casein-derived fragments and five whey-protein sequences were able to inhibit the DPP-IV activity over 80%. Proline at second N-terminal position, an already reported feature, occurred in most of these sequences but three whey derived sequences showed potent activity with other amino acid arrangement.

CONCLUSIONS

Casein and whey-derived peptides were able to significantly induce the secretion of CCK and GLP-1 in enteroendocrine cells. The potent DPP-IV inhibitory effect of some sequences can support the protective effect on GLP-1. The mobilization of the gastrointestinal hormone stores by tailored foods represents a promising strategy to control postprandial glucose levels and intake modulation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP40_13

COMPARISON OF TISSUE-SPECIFIC EFFECTS OF A C8/C10 MEDIUM-CHAIN FATTY ACID SUPPLEMENTED KETOGENIC DIET WITH INTERMITTENT AND SUSTAINED CALORIC RESTRICTION IN MICE

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BACKGROUND AND OBJECTIVES

The growing interest in medium-chain triglyceride (MCT) supplementation for health promotion and disease prevention highlights the need for a comprehensive examination of its physiological effects. Medium-chain fatty acids (MCFAs, C6-C12) are well-known for their capacity to induce ketogenesis and beneficially influence metabolism and mitochondrial function. Building on our previous findings, which demonstrated cardiac cellular adaptations when MCTs were incorporated into a long-chain triglyceride (LCT)-based ketogenic diet (KD), we hypothesized that elevating tissue levels of C8 and C10 fatty acids (FA) in mice would lead to tissue-specific transcriptional changes in nutrient-sensing and metabolic pathways.

METHODS

Male C57BL/6NRJ mice were fed one of several diets for eight weeks: a standard diet (SD), an LCT-only KD, or a KD composed of both LCTs and MCTs (LCT/MCT at a 70/30 ratio). Additionally, two nutrient-limited SD controls were included for the final two weeks of the feeding period: an intermittent fasting (IF) group (24 h feeding/24h) and a caloric restriction (CR) group (20% reduction in total caloric intake). Tissue samples were analyzed using untargeted metabolomics and lipidomics by LC-MS, gene expression by quantitative PCR.

RESULTS

MCT supplementation did not significantly increase C8 FA in brown adipose tissue, heart, cortex, or striatum, but notable elevations were observed in the liver and skeletal muscle. Conversely, C10 FA levels were consistently higher in LCT/MCT-fed mice than in LCT-fed controls across all tissues except the cortex, as confirmed by targeted LC-MS/MS (e.g., heart: 0.112 ± 0.011 vs. 0.075 ± 0.022 μg/mg; cortex: 0.073 ± 0.021 vs. 0.092 ± 0.015 μg/mg). The LCT/MCT and IF groups showed similar metabolism-related gene expression shifts, suggesting comparable metabolic adaptations independent of body weight or adipose tissue mass. In contrast, the CR group showed the most pronounced weight and adipose tissue loss, with no overlap in gene expression patterns with the LCT/MCT or IF groups.

CONCLUSIONS

The similarities in gene expression patterns between IF and LCT/MCT feeding, and their contrast to CR-induced patterns, suggest that the effects are not solely due to reduced nutrient availability. The observed differences in transcriptional responses indicate that MCFAs uniquely regulate tissue metabolism. Ongoing research aims to further distinguish the metabolic and transcriptional changes specifically attributable to C8/C10 FA from those resulting from altered nutrient states more broadly.

CONFLICTS OF INTERESTS

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SOAP40_15

DEVELOPMENT AND ASSESSMENT OF AN INTESTINAL TRI-CELLULAR MODEL TO INVESTIGATE THE PRO/ANTI-INFLAMMATORY POTENTIAL OF DIGESTED FOODS

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BACKGROUND AND OBJECTIVES

Immunonutrition, defined as the potential of foods, nutrients and dietary patterns to modulate the immune system activity, has been proposed as a strategy to enhance the immune response in both metabolic and immune-mediated diseases (1). However, the anti-/pro-inflammatory role of foods and diets is far to be fully ascertained, and thus there is a continued needed for appropriate in vitro cell-culture models to investigate the role of foods in modulating cell-mediated inflammatory processes. This study aims to develop and test an in vitro tri-culture model, simulating the complexity of the intestinal tract and its multiple cell interactions (2,3).

METHODS

The intestinal epithelial barrier was established by co-culturing human CaCo-2 enterocyte-like and HT29-MTX-E12 mucus-producing goblet-like cells, then adding human monocyte THP-1 cells to the basolateral compartment. The integrity and stability of the barrier were monitored and the inflammatory response of the model was assessed using various stressors at different concentrations, both individually and in combination (phorbol-12- myristate-13-acetate or PMA, and lipopolysaccharide or LPS), in terms of cytokines production. To test the model, different concentrations of in vitro digested broccoli (BD) were added to the apical section of the inflamed model during 4 h. Supernatants from the basolateral compartment were collected and analyzed for cytokines production (IL-6, TNF-α, IL-12p70, IL-18 and IL-8) using ELLA Simple Plex. ZO-1 protein from the tight junctions of epithelial cells was analyzed by flow cytometry.

RESULTS

RESULTS indicated that 100 nM PMA added to the whole model for 20 h was the best stressor to simulate a mild-inflammatory status of the gut, as evidenced by TNF-α and IL-6 production. Following treatment with BD at different concentrations, IL-6, TNF-α, IL-8 and IL-18 were significantly reduced compared to the control group. Regarding tight junctions, ZO-1 expression increased at the lowest BD concentration, compared to the control.

CONCLUSIONS

The findings confirm the feasibility of the model for assessing the effects of food digesta representing a valuable strategy for investigating the role of foods in modulating the inflammatory response. RESULTS may support dietary strategies aimed at promoting wellbeing and preventing inflammatory-related metabolic diseases. This research was funded by the EU–NextGenerationEU.ProjectCode:ECS00000041;ProjectCUP:C43C22000380007;Title:Innovation, digitalization and sustainability for the diffused economy in Central Italy–VITALITY.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP 47 - BASIC RESEARCH IN NUTRITION

SOAP47_11

PREDICTORS OF RECOVERY AMONG 6 – 59 MONTHS CHILDREN HAVING UNCOMPLICATED SEVERE ACUTE MALNUTRITION ATTENDING THE OUTPATIENT THERAPEUTIC FEEDING PROGRAM OF HEALTH CENTRES IN KANDAHAR CITY, AFGHANISTAN: A MULTICENTRE PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES

Severe Acute Malnutrition (SAM) is a significant contributor to child mortality and morbidity, accounting for millions of deaths annually in low-resource settings such as Afghanistan. Kandahar, one of the most affected provinces, faces a critical situation with over 100,000 under-five children suffering from SAM. This study aims to identify the predictors of recovery among children (6–59 months) having uncomplicated SAM, attending the outpatient therapeutic feeding programs of health centers in Kandahar, Afghanistan.

METHODS

A multicenter prospective cohort study enrolled 713 children from September 2023 to March 2024, with a follow-up period of one to three months. Participants were selected using a consecutive sampling technique. Baseline, follow-up, and exit data were collected through structured questionnaires and anthropometric measurements, guided by the national Integrated Management of Acute Malnutrition (IMAM) protocol. Key variables include socio-demographic factors, parental characteristics, clinical conditions, and adherence to treatment. Recovery was defined as achieving a mid-upper arm circumference (MUAC) ≥125 mm, weight-for-height Z-score ≥−2SD, or absence of edema for two consecutive visits. The chi-square test was used to identify predictors of recovery from uncomplicated SAM; statistical significance was indicated at 95% CI and a p-value of <0.05.

RESULTS

The recovery rate from SAM in this study was 79.5% (567/713), above the nationally accepted standard. Significant predictors of recovery included maternal literacy (OR 12.79, 95% CI 4.00–40.86, $p < 0.001$), full adherence to routine antibiotics (OR 4.28, 95% CI 2.77–6.67, $p < 0.001$), and access to improved water sources (OR 3.82, 95% CI 2.66–5.48, $p < 0.001$). Conversely, predictors of non-recovery included comorbidities (OR 1.76, 95% CI 1.24–2.51, $p = 0.001$), missing RUTF doses (OR 2.12, 95% CI 1.25–3.60, $p = 0.004$), and large family size (>7 members; OR 3.95, 95% CI 2.78–5.63, $p < 0.001$).

CONCLUSIONS

Maternal literacy, antibiotic adherence, and access to improved water were key predictors of recovery, while comorbidities, poor RUTF adherence, and large family size predicted non-recovery. Addressing these factors through policy-level interventions; such as promoting girls' education (future mothers), scaling adherence counselling, treating comorbidities, and increasing access to safe water can significantly improve outcomes. The Ministry of Public Health and healthcare providers should prioritize these predictors in program designs to reduce SAM related morbidity and mortality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP47_01

SUBSTANTIAL AGREEMENT BETWEEN RATERS WHEN CATEGORIZING ULTRA-PROCESSED FOODS IN A LARGE DIETARY SURVEY – A PILOT STUDY

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BACKGROUND AND OBJECTIVES

High consumption of ultra-processed food (UPF) has been associated with negative health outcomes in numerous observational studies. The Nova-system is designed to classify foods based on their degree of processing. Applying the Nova-system on dietary surveys may not be straightforward and substantial differences between raters have been reported. The objective of the present pilot study was to assess the inter-rater reliability (IRR) for categorizing the food items in a large Swedish national dietary survey as UPF or non-UPF.

METHODS

In the latest edition of the Swedish national dietary survey "Riksmaten", 1 797 adults reported their intake through a web-based, self-administered 4-day food record. The dietary database included 1900 food items. A random sample of 100 items was drawn for the purpose of this pilot-study. A detailed protocol was developed based on published definitions, and two researchers (both Swedish residents educated in dietetics) independently classified the items into three categories; 1) UPF, 2) non-UPF, and 3) homemade composite dishes assumed to contain >10 E% UPF. Ambiguous items were flagged for sensitivity analysis by classifying them into alternative groups. IRR was assessed by unweighted Cohen's Kappa (κ).

RESULTS

The overall IRR was considered "substantial" with κ 0.67 (95% CI 0.53, 0.80), and "fair" (κ 0.54 [0.37, 0.71]) for assigning items to sensitivity analysis (Table 1). The level of agreement varied substantially between food categories: fruits & vegetables were classified with 100% agreement, while agreement was considerably lower for beverages and for grains & cereal products. Major sources of inconsistency included determining if food items should be treated as mainly homemade or industrially prepared, as well as assessing the functional properties of food additives.

Table 1. IRR for the classification of foods as UPF

	n	Cohen's κ	95% CI	% Agree
All items, main analysis	100	0.67	0.53 – 0.80	82
Flagged for sensitivity analysis	100	0.54	0.37 – 0.71	79

CONCLUSIONS

This pilot-study shows that the food-items reported in a large national dietary survey could be identified as UPF or non-UPF with substantial level of agreement between two researchers with knowledge about the local food environment. Simultaneously, it highlights the need for a detailed and locally adapted protocol, in addition to previously published definitions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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SOAP47_04

PTEROSTILBENE MODULATES NUCLEAR METABOLITES LINKED TO EPIGENETIC REGULATION IN LIVER CANCER

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BACKGROUND AND OBJECTIVES

The liver is central to metabolic regulation but is highly susceptible to damage from environmental and dietary factors. Metabolic dysregulation contributes to liver diseases such as hepatic steatosis, steatohepatitis, and hepatocellular carcinoma (HCC). Epigenetic mechanisms, including DNA methylation and histone modifications, regulate gene expression in response to metabolic cues. Polyphenols like pterostilbene (PTS) have demonstrated protective effects in liver disease, particularly in reactivating tumor suppressor genes and silencing oncogenes through epigenetic mechanisms. However, the precise role of PTS in modulating nuclear metabolite availability and epigenetic activity remains unclear. This study investigates the impact of PTS on nuclear metabolites linked to epigenetic regulation in a rat model of HCC.

METHODS

Rats were fed a choline-deficient L-amino acid-defined (CDAA) diet, a model known to induce HCC, with or without PTS supplementation. A custom array of epigenetically relavant metabolites was designed. Nuclear and cytoplasmic metabolites were fractionated using a custom protocol and analyzed by LC-TQMS. RNA sequencing determined differential gene expression between groups.

RESULTS

PTS strongly attenuated HCC development. Liver samples from CDAA+PTS-treated rats showed significant changes in nuclear metabolites from the one-carbon metabolism (OCM) pathway, as compared to CDAA group. Nuclear betaine levels increased, while sarcosine, S-adenosylhomocysteine (SAH), and cystathionine decreased, suggesting a metabolic shift. The nuclear SAM:SAH ratio was significantly higher in the CDAA+PTS group, indicating restoration of homeostasis in methylation reactions. RNA sequencing revealed upregulation of OCM-related genes, supporting PTS-mediated modulation of OCM pathways. Although non-significant, α-ketoglutarate, a co-factor for histone and DNA demethylases, exhibited an increased trend in nuclear fractions, suggesting a potential role in epigenetic remodeling.

CONCLUSIONS

PTS alters nuclear metabolite availability associated to epigenetic mechanisms, largely restoring levels that are present in healthy rats. By shifting nuclear metabolite pools, PTS promotes regaining the equilibrium in methylation reactions, which may translate into changes in the epigenetic landscape and gene expression. Further studies will elucidate polyphenol interactions with epigenetic machinery to optimize dietary strategies for liver disease prevention and treatment.

CONFLICTS OF INTERESTS

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SOAP47_05

ASSESSING VITAMIN A STABILITY IN EDIBLE OILS IN ZAMBIA

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BACKGROUND AND OBJECTIVES

The 2023 Zambia Food Consumption and Micronutrient Status Survey highlights vitamin A deficiency as a critical public health problem. While mandatory fortification of sugar with vitamin A exists, fortifying edible oils could further enhance nutritional status. This study by USAID, Advancing Food Fortification Opportunities to Reinforce Diets in collaboration with the National Institute for Scientific and Industrial Research studied how oil quality, specifically, peroxide value (PV) and free fatty acid (FFA) levels affect vitamin A stability.

METHODS

Four oil types, sunflower, soybean, soy-palm blend, and palm oil were fortified with vitamin A at a concentration of 25 mg/kg and stored in clear virgin polyethylene terephthalate bottles. Oils were stored under light and dark conditions for 12 weeks, with measurements of vitamin A, FFA, and PV taken weekly for the first four weeks and bi-weekly thereafter.

RESULTS

After four weeks, the acid values of unfortified and fortified oils were below the Zambia Standard threshold of 0.6 mg potassium hydroxide (KOH)/g for three oil types, while fortified palm oil stored in light conditions reached 0.68 mg KOH/g. Fortified palm and soy-palm blend oils exceeded the 10-milliequivalents/kg peroxide value threshold, whereas others remained below 50% of the maximum acceptable limit. Vitamin A stability differed with storage conditions, exhibiting losses of 0% to 15%, with palm oil presenting the highest loss.

CONCLUSIONS

The findings underscore the relevance of oil quality and storage conditions in maintaining vitamin A stability, offering valuable insights for enhancing national food fortification strategies.

CONFLICTS OF INTERESTS

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SOAP47_10

THE PUTRA COMMUNITY NUTRITION AMBASSADOR PROGRAMME (PUTRACNAP): A CLUSTER-RANDOMIZED CONTROLLED TRIAL TO IMPROVE DIETARY QUALITY AND PHYSICAL ACTIVITY IN LOW-INCOME FAMILIES

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BACKGROUND AND OBJECTIVES

This study aimed to evaluate the effectiveness of the PUTRACNAP intervention in improving lifestyle practices, specifically dietary quality and physical activity, among low-income mother-child pairs in Kuala Lumpur.

METHODS

A cluster-randomized controlled trial was conducted across 10 low-cost flats in Kuala Lumpur, involving 37 mother-child pairs (children aged 7-12 years). Participants were randomly assigned to either the intervention group (19 pairs), which participated in a 12-week program featuring interactive nutrition education and farming activities aimed at promoting healthy eating and active lifestyle practices, or the control group (18 pairs), which received basic nutrition advice. Dietary quality and physical activity were assessed at baseline, post-intervention, and at a six-month follow-up using standardized questionnaires. Generalized Estimating Equations (GEE) were used to analyze the data, with statistical significance set at $p<0.05$.

RESULTS

For mothers, no significant differences were observed in physical activity levels between the two groups at any time point. However, the intervention group showed a significant increase in vegetable servings (B = 3.34, SE = 1.07, p = 0.002), along with a reduction in total calorie intake (B = -619.80, SE = 278.30, p = 0.026), protein intake (B = -36.75, SE = 14.70, p = 0.012), and fat intake (B = -25.21, SE = 11.89, p = 0.034) compared to the control group at post-intervention, after adjusting for covariates. Additionally, a significant increase in sodium servings was observed in the intervention group at both time points ($p < 0.05$), after adjusting for covariates.

For children, no significant differences were found in physical activity or diet quality. However, the intervention group showed positive trends, including higher physical activity, servings of vegetable, meat, poultry, eggs, legumes, and nuts, alongside reductions in servings of fat, sodium, and added sugar, at both time points.

CONCLUSIONS

The intervention led to significant improvements in dietary habits among mothers, including increased vegetable servings and reduced calorie, protein, and fat intake, while children exhibited positive trends in physical activity and dietary quality despite no significant differences in these areas. Overall, these findings suggest the intervention was particularly effective for mothers and point to the need for further exploration into optimizing interventions for children.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP47_13

FACTORS ASSOCIATED WITH MODERATE TO SEVERE FOOD INSECURITY IN ULTRA POOR SLUM SETTLEMENTS OF BANGLADESH

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BACKGROUND AND OBJECTIVES

An understanding of the prevalence and socio-demographic factors associated with food insecurity among the ultra-poor slum dwellers is crucial for achieving nutritional and developmental targets. We assessed the level of household food insecurity and determinants of moderate to severe food insecurity among slum-dwellers in Dhaka and Saidpur.

METHODS

We conducted a cross-sectional study and interviewed 682 mothers with 0-23-month-old children in the slums. Cluster sampling approach was utilized to select the participants. The interview questionnaire comprised socio-demographic, household, food security, clinical and water, sanitation and hygiene related variables. We utilized descriptive analysis to report the status of household food security. Poisson regression with robust variance was used to determine crude and adjusted prevalence ratios (APR) with a 95% confidence interval (CI) to find the factors associated with household food insecurity.

RESULTS

We found that 60.1 % of the households were food insecure (16.2% mild, 17.5% moderate and 26.9% severe food insecure). Female headed households (APR: 1.4; 95% CI:1.2,1.7), lower household monthly income i.e.< 10,000 Taka (APR: 1.5; 95% CI:1.2,1.7), households with 5 or more members living in a single room (APR: 1.4; 95% CI:1.0, 1.8), households not having improved sanitation facility (APR: 1.2; 95% CI:1.0, 1.5) and households using unclean cooking fuel (APR: 1.3; 95% CI:1.1, 1.6) were significant factors associated with moderate to high food insecurity.

CONCLUSIONS

Food insecurity remains high among the slum dwellers. These factors should be considered for designing programs to improve food insecurity among the ultra-poor slum dwellers. Targeted social safety net programs and improvement of housing and sanitation can be undertaken to help reduce food insecurity in the ultra-poor slum settlements.

CONFLICTS OF INTERESTS

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SOAP47_14

ULTRA-PROCESSED PLANT-RICH DIETS AND RISK OF MORTALITY: FINDINGS FROM A LARGE-SCALE PROSPECTIVE STUDY

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BACKGROUND AND OBJECTIVES

The health impacts of plant-rich diets containing high vs. low levels of ultra-processed foods (UPFs) remain to be explored. Here, we investigated whether healthful vs. unhealthful plant-based diet indices (hPDI vs. uPDI) show differential associations with mortality risk based on UPF consumption.

METHODS

Data from 124,791 UK Biobank participants who completed at least two 24-h dietary assessments were analysed. Four modified PDIs were created, retaining the original PDI structure but differing in the inclusion and exclusion of plant-sourced UPFs within plant-food groups. UPF-based scores included only plant-sourced UPFs, while non-UPF-based scores included only plant-sourced non-UPFs. Cox proportional hazards models adjusted for potential confounders were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) across quartiles (Q1-Q4) of the PDIs.

RESULTS

Over a median 10.6 years of follow-up, 5,780 deaths were recorded. Higher UPF-hPDI and non-UPF-hPDI scores were associated with 16% and 12% lower mortality risks, respectively [HR (95% CI) Q4vsQ1: 0.84 (95% CI: 0.78-0.90), p-trend = <0.001; HR (95% CI) Q4vsQ1: 0.88 (95% CI: 0.82-0.95), p-trend = <0.001]. Conversely, higher UPF-uPDI and non-UPF-uPDI scores were associated with 17% and 15% higher mortality risks, respectively [HR (95% CI) Q4vsQ1: 1.17 (95% CI: 1.09-1.26), p-trend = <0.001; HR (95% CI) Q4vsQ1: 1.15 (95% CI: 1.06-1.24), p-trend = 0.002].

CONCLUSIONS

These findings suggest that consuming plant-rich diets influences mortality risk, while the amount of UPFs consumed does not play a major role. Comparable associations across UPF and non-UPF PDIs suggest that dietary quality may outweigh processing in these contexts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOAP47_16

ESTIMATION OF TOTAL FLAVONOID AND FLAVONOID CLASS INTAKE OF OLDER AUSTRALIANS FOLLOWING A MEDITERRANEAN DIET AND WALKING INTERVENTION FOR 6-MONTHS

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BACKGROUND AND OBJECTIVES

The purported anti-inflammatory and anti-oxidative properties of the MedDiet is likely due to the plant-based nature of the dietary pattern which contains key provides vitamins, carotenoids and flavonoids. We have previously estimated the flavonoid consumption of an older Australian population but not following a MedDiet intervention. The aim of this project was to assess total flavonoid and flavonoid class intake and major food contributors among n=134 older Australians aged 74.2±5.7 years following a MedDiet or habitual diet for 6-months.

METHODS

The MedWalk trial was a multi-site 12-month RCT exploring the effect of a MedDiet and a walking intervention on dementia risk in older Australians. Each participant completed a 4-day weighed food record which was analysed using Foodworks 10. Data was exported to Microsoft Excel and the weight (grams) of each flavonoid containing food was calculated milligram flavonoid per gram of food consumed per person was then estimated using the USDA Database for the Flavonoid Content of Selected Foods (Release 3.3) and Phenol Explorer. Total flavonoids, and six subclasses (anthocyanidins, flavanols, flavanones, flavones, flavonols, and isoflavones were estimated. Linear mixed effects models with a group x time interaction were performed to assess differences in intakes of total flavonoids and subclasses between the MedDiet and HabDiet groups.

RESULTS

Total flavonoid intake was significantly higher in the MedDiet group at 6-months, compared with the HabDiet group (420.2±331.2mg/d vs. 308.1±342.7mg/d, P= .02). Similarly, flavones and flavonols were higher in the MedDiet group at 6-months compared with the habitual group (P<.01). The primary subclass contributing to total flavonoid intake was flavanols, from tea, for both groups. Other major sources of flavonoids in the MedDiet group included berries, citrus fruits, red wine, and juice and white wine, onion, citrus and apples/pears in the HabDiet group.

CONCLUSIONS

These data are similar to other calculated flavonoid intakes from Europe (428mg/d), Korea (318mg/d) and the US (200mg/d), however differed from our previous study in n=1183 middle aged Australians (626mg/d) and another Australian study in older Australians (683mg/d). Nevertheless, the MedDiet appears to be a suitable dietary pattern to increase total flavonoid intake after 6-months.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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The future of nutrition recommendations

EPO1 - The future of nutrition recommendations

EPO1_001

MACRONUTRIENT, CAFFEINE AND WATER INTAKE ACCORDING TO SEX AND MENTAL MORBIDITY STATUS: A FOCUS ON ANXIETY, INSOMNIA, AND EATING DISORDERS

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BACKGROUND AND OBJECTIVES
Mental health has historically received less attention than physical health despite its contribution to disease burden, worsened by the COVID-19 pandemic. Moreover, mental multimorbidity is not uncommon. There is accumulating research evidence from nutritional epidemiology and from nutritional psychiatry, of the prominent role of diet and nutrition in the etiology, treatment and prevention of mental illness. This descriptive, cross-sectional study explored macronutrient, caffeine and water intake according to mental health status, focusing on pure and comorbid anxiety, insomnia, and eating disorders (ED).

METHODS
We used data collected during 2013-2017 in the French NutriNet-Santé general-population cohort. Outcomes included general anxiety, chronic insomnia and ED, assessed with validated tools. Eight mental morbidity groups were studied: no mental morbidity, anxiety alone, insomnia alone, any ED alone, comorbid anxiety and insomnia, comorbid anxiety and ED, comorbid insomnia and ED, and multimorbid anxiety, insomnia, and ED. All data were weighted according to sex-, age- and socioeconomic status in the 2016 French Census, and analyzed with ANOVA.

RESULTS
Among N= 23965 adults, 505 had anxiety-insomnia-ED multimorbidity; a weighted total of 38.9% presented ≥1 mental disorder. For all comorbid and multimorbid conditions, women were at higher risk than were men. Macronutrient intake was more linearly associated with degree of mental morbidity among men than among women. Men with multimorbidity had the highest proportion of carbohydrates in the diet and the lowest intakes of proteins and various lipids. The multimorbidity group had the highest caffeine intake across sex whereas water intake had no dose-response association with degree of mental morbidity.

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CONCLUSIONS

This weighted analysis provided descriptive information about dietary intake according to mental morbidity status. Sex-specific intake profiles emerged which could help inform nutrition prevention programmes and dietary guidelines for at-risk populations. The findings could serve as an impetus for future multimorbidity research and for the generation of novel hypotheses regarding dietary exposures that might play a role in mental multimorbidity risk.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_003

NUTRITIONAL QUALITY, PERCEPTIONS, AND SENSORY EVALUATION OF PLANT-BASED MEAT ALTERNATIVES

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BACKGROUND AND OBJECTIVES
Plant-based diets are associated with reduced risk of cancer, cardiovascular disease, diabetes, and overall mortality. Plant-based meat alternatives (PBMAs) are food products that mimic the sensory traits of animal-based products, to encourage meat replacement. With burgeoning popularity in PBMA innovation, little is known about the nutritional quality and acceptability of PBMAs. This study aims to compare the nutritional quality and perceived acceptability of PBMAs with their meat counterparts.

METHODS
Nutritional quality assessment of PBMAs sold in major supermarkets and online grocery retailers were compiled and evaluated against local Recommended Dietary Allowances (RDAs). Subjects (n=52) were recruited to complete a self-administered online survey to assess perceived acceptability (health attitudes, perceptions, knowledge, consumption patterns) of PBMAs. A sub-set of subjects (n=21) were recruited for the sensory evaluation trial, consisting of six different food samples to determine acceptance and sensorial differences between PBMAs, conventional meat products and homemade meat equivalents.

RESULTS
Forty-one food products were evaluated. PBMAs contained the highest fibre content but have lower protein than homemade meats, with plant-based sausages containing the highest saturated fat. Overall, homemade meat products offer better nutritional quality and at a lower cost than PBMAs. About half (51.9%) of the participants are 21–30-year-olds, with equal numbers of each gender (26 males and 26 females), and their mean BMI is 23.3±4.7kg/m2. Males (OR=4.25, *P=0.015*) and being of obese BMI (OR=6.67, *P=0.034*) is associated with higher likelihood of PBMA purchase. Males (OR=3.60, *P=0.029*) and being within the age group 31-40 (OR= 14.00, *P=0.021*) were associated with increased likelihood of replacing meat with PBMAs. Interestingly, the perception of having to eat healthily and that PBMAs are healthier than meat products are associated with purchase and replacement intent ($P<0.05$). Sensory evaluation trial suggested that nuggets and fish fingers were the most susceptible to differential taste preferences (taste, texture, colour, saltiness and fattiness) ($P<0.05$), and meat and patties are just differentiated by salt perception ($P<0.05$).

CONCLUSIONS
Understanding the nutritional differences and perceived acceptability of PBMAs can aid in nutrition education of plant-based diets and help develop evidence-based guidelines, enabling informed food choices when purchasing PBMAs in an evolving food landscape.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_005

MOBILE DIETARY DIARY APP PROMOTING HEALTHY EATING HABITS AND FOLLOWING DIETARY RECOMMENDATIONS

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BACKGROUND AND OBJECTIVES

Many people have difficulty following dietary recommendations [1]. The increasing expectation to achieve goals as easily as possible is growing and includes the use of mobile devices to improve health and prevent diet-related diseases. Aim: To present a new mobile application (Dietary Diary App, DDA) dedicated to the general population, which will make it easier for users to follow dietary recommendations by helping them choose food items and the adequate frequency of food consumption [available on: 2].

METHODS

The app is a mobile version of dietary diary ('Self-monitorYourDiet®') which was previously developed as a printed version. Scientific databases and websites were searched to summarise the evidence regarding dietary guidelines for the general population. In developing dietary recommendations, scientific evidence on diet and health, as well as the environmental implications of the recommended diet (e.g. planetary approach), were taken into consideration. Dietary recommendations and single food items were chosen based on food-based dietary guidelines developed for the Polish general population and other European countries. While developing the diary, a qualitative approach was applied. The dietary recommendations were expressed as recommended frequency consumption of single food items.

RESULTS

The DDA contains 11 foods, including six foods recommended for consumption: vegetables, fruit, dairy foods, whole grains, fish/seafood, legumes/nuts/seeds, and five foods with limited consumption: meat products, sweets/sugar, sweetened beverages/energy drinks, fast foods, alcohols, along with the indicated consumption frequency per day/week. Fats were not included in the DDA because it is difficult for consumers to accurately determine intake of invisible fats. While using the DDA users should record each eating episode of single food items in a qualitative manner (as frequencies). The DDA was tested in 20 adults (female/male). Most of the users reported that they were not burdened with the use of this app, they reported, for example: "it was easy".

CONCLUSIONS

Mobile Dietary Diary App presents a new picture of well-known dietary recommendations for the general population. The first testing of the DDA showed that this app was easy to use for users.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_006

ASSESSING INFORMATION PREFERENCES FOR HEALTH-PROMOTING FOODS IN LATIN AMERICA

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BACKGROUND AND OBJECTIVES
Food and nutrition illiteracy is a growing global concern, exacerbated by the increasing prevalence of misinformation that negatively impacts public health. Conversely, the implementation of effective, evidence-based communication is essential for empowering individuals to make informed dietary choices. This research aimed to map the current ways in which the population in Latin America seeks information about foods and beverages that promote health and well-being. Additionally, it seeks to identify preferences for improving the effectiveness of evidence-based communication in this context.

METHODS
A quantitative study was conducted using online surveys, engaging 6,150 men and women across 11 Latin American countries during January and February 2023. Participants were included based on the criteria that they expressed concern for health and nutrition and were responsible for purchasing food for their households.

RESULTS
Six out of ten Latin Americans primarily seek information about health-promoting foods through online channels. Social networks emerged as the most effective platforms for respondents, with 62% expressing a preference for these channels. Among them, YouTube was the top choice at 31%, followed by Instagram at 28%, Facebook at 27%, and WhatsApp at 17%. In-person assistance from healthcare professionals is also a preferred source of information for 51% of respondents, with Colombia (60%) and Argentina (57%) showing the highest preference. Conversely, radio shows and books are the least favored sources, with only 9% and 14% preference, respectively.

CONCLUSIONS
This study highlights the significant role that online channels, particularly social networks, play in shaping how individuals in Latin America access information about health-promoting foods. The findings underscore the need for healthcare professionals to leverage these platforms for effective communication and education. While in-person consultations remain important, the lower preference for traditional sources like radio shows and books indicates a shift towards digital information. By understanding and utilizing these channels, healthcare professionals can enhance their impact on public health and empower individuals to make informed dietary choices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_007

IMPACT OF DIETARY INTERVENTIONS ON GLYCEMIC REGULATION: A COMPARATIVE ANALYSIS

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BACKGROUND AND OBJECTIVES

Intermittent fasting has gained recognition as a promising approach to improve cardiometabolic health, though findings remain inconsistent. This study evaluated the effects of three dietary interventions—Mediterranean diet (MedDiet), caloric restriction (CR), and time-restricted eating (TRE)—on glycemic regulation applying mixed linear models.

METHODS

A total of 84 participants aged 50-70 years with a BMI of 25-40 kg/m² and incipient fatty liver disease were randomized into three groups: MedDiet (control), CR, or TRE. Continuous glucose monitoring (CGM) data were collected using Abbott FreeStyle Libre 3 devices over seven days, at baseline and after six months. A custom algorithm computed key glycemic metrics, including mean glucose, maximum glucose, AUC, MAGE, MODD, CONGA, J-index, kurtosis, and skewness. Mixed linear models considered time, age, and sex as fixed effects, with participant ID as a random effect.

RESULTS

The TRE group showed significant improvements in glycemic stability, with reduced intra- and inter-day variability (CONGA, MODD). They also experienced lower glucose rises after breakfast. In the MedDiet group, post-dinner mean glucose levels remained elevated. In the CR group, higher kurtosis between 4 p.m. and 8 p.m. indicated more pronounced post-meal glycemic peaks. Additionally, maximum glucose and AUC during sleeping hours increased significantly, suggesting greater nocturnal glucose elevations in this group.

CONCLUSIONS

TRE emerged as the most effective intervention for enhancing glycemic stability, while CR was associated with increased nocturnal glucose levels and MedDiet showed persistent post-dinner glucose elevations. These findings highlight the potential of personalized dietary interventions to individual glycemic patterns for improved cardiometabolic health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_008

ASSESSMENT OF THE TRADITIONAL FOOD-SHARING BEHAVIOR OF URBAN HOUSEHOLDS IN SENEGAL AND IMPLICATIONS OF THEIR NUTRITIONAL STATUS IN URBAN FOOD SECURITY

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BACKGROUND AND OBJECTIVES

This study aimed to quantify the extent of food-sharing behavior and its implications for food security in rapidly urbanizing Senegal. A significant proportion of the population (49.8 %) was affected by moderate or severe food insecurity, which is a considerable concern(FAO Stat,2024). Urban households engage in traditional food-sharing behaviors that involve the consumption of meals prepared by one household and shared with individuals outside the family. Despite the prevalence of food-sharing among urban residents, the nutritional implications of this practice are poorly understood.

METHODS

In 2022, a two-stage sampling approach was employed to select 200 households from 33 districts in Saint-Louis, Senegal(Magnani,1997). For five days, data regarding the weight and ingredients prepared for breakfast, lunch, and dinner and number of individuals consuming these meals were recorded. The number of individuals who shared meals and their relationships were interviewed. A 24-h recall and weighing method was used to calculate the individual mean dietary intake.

RESULTS

The findings indicated that 5%, 15%, and 11% of the total meal weight was provided to non-household members during breakfast, lunch, and dinner, respectively. On average, approximately 2600 kcal per capita was prepared daily in the household, and approximately 360 kcal was shared with others. This amounts to an average of approximately 2500 kcal per household daily being provided to non-household members. These shared meals were often provided to friends, neighbors, and children engaged in religious alms-seeking, reflecting the culture and context of the region. This practice may help improve food access in urban areas.

CONCLUSIONS

African countries, including Senegal, exhibit low food self-sufficiency and rely heavily on imported staples, such as rice and wheat(FAO Statistical Yearbook,2023). This dependence increases vulnerability to food security challenges, including fluctuating international food prices. Traditional food-sharing practices are important in mitigating food insecurity. However, African countries are vulnerable to food crises resulting from unpredictable risks, such as global population growth and climate change. This study emphasizes the urgent need for sustainable food systems and innovative strategies to integrate food culture into regional contexts to ensure long-term food security.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_009

INFLUENCE OF PROBIOTICS ON AMINO ACID ABSORPTION AND METABOLIC RESPONSES TO PLANT-PROTEIN CONSUMPTION

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BACKGROUND AND OBJECTIVES
Emerging evidence suggests that probiotics may augment the absorption of plant proteins. The objective of this study is to examine the impact of probiotics supplementation on postprandial changes in amino acid, glucose and insulin levels in healthy volunteers after the consumption of a plant-protein beverage.

METHODS
A plant-based beverage (20g protein per serve) consisting of a combination of plant-protein blends (brown rice and pea) with an optimal amino acid composition was formulated. In a randomized, single-blind, placebo-controlled, crossover trial, twenty healthy subjects completed two separate 14-day supplementation protocols of either probiotic (L. plantarum, B. logum, B. animalis ssp. lactis.) or placebo, separated by a 4-week washout period. Body composition and demographics were measured upon arrival to the laboratory on day 15, following a 10-12 hour overnight fast. Subjects was given the same plant protein beverage with probiotic or placebo supplement at each study visit. Blood samples were taken at 0 (baseline) and 15, 30, 60, 90, 120, 180 mins post consumption for analysis of plasma amino acid, glucose and insulin concentrations. The area under the curve (AUC180) over 180 mins was calculated using the linear trapezoidal rule for each of the 20 amino acids, insulin and glucose concentrations. Mean differences between treatment were assessed using generalized estimating equations (GEE) and paired observations were compared using the Wilcoxon signed-rank test. A p-value of <0.05 will be considered as statistically significant.

RESULTS
The mean age and BMI of the subjects are 29.0 ± 5.4 years and 20.9 ± 1.2 kg/m2 respectively. Phenylalanine ($P<0.001$), tryptophan ($P<0.001$), tyrosine ($P=0.012$), asparagine ($P=0.034$), and histidine ($P<0.001$) all showed significantly greater AUC with probiotics supplementation than placebo, following the consumption of the plant-based beverage, suggesting increased amino acid absorption to support muscle protein synthesis,. No statistical differences were observed for glucose and insulin responses between treatments ($P>0.05$).

CONCLUSIONS
Probiotics supplementation may be beneficial in improving the bioavailability of certain amino acids from plant-based proteins, making plant-based diets more nutritionally complete and appealing. Further research is needed into the mechanisms by which probiotics can optimize plant-based nutrition and overall health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_011

PREVALENCE OF EATING DISORDERS AND ASSOCIATED RISK FACTORS IN PEOPLE LIVING WITH DIABETES

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BACKGROUND AND OBJECTIVES
The prevalence of eating disorders (ED) and diabetes mellitus (DM), encompassing both type 1 diabetes mellitus (T1DM) and type 2 diabetes mellitus (T2DM), has been observed to exhibit a bidirectional relationship. The complex relationship can adversely impact an individual's quality of life. However, there is a paucity of studies investigating the prevalence of such health complications in Africa. Against this background, this study evaluated the prevalence of eating disorders among diabetes mellitus patients and assessed associations between eating disorders and a range of potential risk factors using the SCOFF questionnaire.

METHODS
Patients (n=101) living with diabetes and being managed at University College Hospital were recruited to fill out a questionnaire on eating disorders using the Scoff Scale, and socio-demographic data were collected.

RESULTS
The vast majority (81.2%) of the study participants had an eating disorder, among which about 59.8% of the females had the condition, and 41.6% of the participants were overweight. Multivariable analysis indicated that the odds of eating disorders in the female participants were 2.17 times higher (OR = 2.17, 95% CI = 1.31 - 3.58%) compared to male participants. Participants aged above 60 years had nearly 2 times higher odds of eating disorders compared to those younger than 20 years; overweight and obese participants had 1.64 and 1.49 times higher odds of eating disorders, respectively, compared to underweight participants. Those who had tertiary education had 0.66 times lower odds of eating disorders when compared to those with no educational levels, and those with professional jobs were 0.62 less likely to have an eating disorder when compared with students. The RESULTS also revealed that retired participants had 0.81 times lower odds of eating disorders when compared with students.

CONCLUSIONS
The findings show that eating disorders are highly prevalent in diabetic patients, which can expose them to complications of diabetes, such as depression and anxiety. It is expedient to diagnose an eating disorder early in diabetic patients because wrong dietary advice may expose them to eating disorders, which would increase the health and economic burden on the nation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_012

DOSE-DEPENDENT EFFECTS OF OAT AND BARLEY BETA-GLUCAN ON GLYCAEMIC RESPONSE: A REVIEW OF BENEFITS BELOW 4G PER 30G AVAILABLE CARBOHYDRATES

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BACKGROUND AND OBJECTIVES

Postprandial blood glucose levels rise after carbohydrate intake, influenced by food composition and individual factors. Impaired glucose tolerance elevates the risk for cardiovascular disease and metabolic disorders [1-2]. Foods that reduce glycaemic responses without excessive insulin release are beneficial [3]. Beta-glucans from oats and barley lower postprandial glycaemic responses by forming gels in the digestive tract, slowing carbohydrate absorption [4]. In 2011, EFSA confirmed that 4 g of beta-glucans per 30 g of available carbohydrates (avCHO) reduces postprandial glycaemic responses (i.e. incremental area under the curve, iAUC) without disproportionate insulin increases. Later studies suggest this effect may occur with lower beta-glucan intake. The primary aim of this review was to evaluate human studies on the effects of oat and barley beta-glucan intake on glucose iAUC.

METHODS

A PubMed/Medline search was conducted using defined key terms— oat AND barley AND (beta-glucan OR b-glucan) AND (post-prandial OR postprandial) AND (glucose OR glycemi* OR glycaemi*), including only English-language trials. Recent meta-analyses and systematic reviews were also examined to identify additional studies. Studies with chronic feeding, non-oat/barley beta-glucan, or diabetic participants on medication were excluded. Inclusion criteria included only randomized, controlled human studies assessing acute effects of beta-glucan on glucose iAUC and peak glucose rise compared to a control or reference food with similar avCHO. Studies were categorized into dose ranges so the average beta-glucan dose / 30 g avCHO within each of the categories included 1, 2, 3 or 4 g / 30 g avCHO.

RESULTS

We included 26 pertinent studies (51 study arms) [5-30]. Across all studies, iAUC was reduced by 22.74% (95% CI:-26.81, -18.66). The majority of beta-glucan dosages from 1.5 to 3.9g/30 g avCHO significantly reduced glycaemic response measured by glucose iAUC or peak glucose rise. Among all statistically significant interventions, iAUC was reduced by 33.05% (95% CI: -37.89, -28.21). In the 2g dose group (1.5–2.4g), 56% of interventions were significant, with iAUC reduced by 23.23% (95%CI: -29.51, -16.94) among all interventions and by 33.27% (95%CI: -37.68, -28.87) among significant interventions.

CONCLUSIONS

At least 2 g oat beta-glucan / 30 g avCHO taken together with a meal are required for glycaemic benefits. This amount is lower than the amount required for the already approved EFSA claim in 2011 [31]. This dose allows more beta-glucan foods to provide postprandial glycaemic effects, potentially benefiting more individuals.

CONFLICTS OF INTERESTS

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EPO1_013

LUNASIN ACTS AS AN IMMUNOMODULATOR AND ALLEVIATES METABOLIC DISORDERS IN DIET-INDUCED OBESE MICE

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BACKGROUND AND OBJECTIVES
In adiposity, excessive energy accumulates in adipocytes accompanied by chronic low-grade inflammation and immune dysregulation, triggering metabolic disorders. Lunasin, a seed peptide, has been shown to execute various bioactive properties such as anti-carcinogenic, anti-inflammatory, and anti-oxidative effects. This study aimed to investigate the immunomodulatory properties of lunasin in diet-induced obese (DIO) mice.

METHODS
Six-weeks-old male C57BL/6J mice were divided into three groups: normal diet (ND), high fat and high fructose diet (HF), and HF with an intraperitoneal injection of synthetic lunasin at 25 mg/kg body weight/4 days /week (HFL). After 27 weeks of dietary intervention, mice were sacrificed, and body composition, plasma, liver, epididymal white adipose tissue (eWAT), and splenocytes were collected for analysis.

RESULTS
The body weight, fat mass, body mass index (BMI), intraperitoneal glucose tolerance test (IPGTT), and insulin level were higher in mice of the HF group, and the lunasin intervention significantly reduced these parameters. Moreover, lunasin alleviated alanine aminotransferase (ALT) level, liver steatosis, and normalized adipocyte size in the DIO mice. In immunomodulation, lunasin increased T cells proliferation, CD4+ T cells proportion, and interleukin (IL)-6 secretion but decreased IL-10 production in Concanavalin A (ConA)-stimulated splenocytes. In addition, lunasin reduced the proportion of CD19+ and CD19+MHCII+ B cells, and lipopolysaccharide (LPS)-stimulated IL-6 secretion in splenocytes.

CONCLUSIONS
The study has demonstrated that lunasin improved body composition, glucose homeostasis, liver steatosis, adipocyte size, and regulated proportions and responses of T and B cells in the DIO mice. It indicated that lunasin exhibits potential immunomodulatory effects and may be related to alleviating metabolic disorders.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_014

LUNASIN ENHANCES OXIDATIVE STRESS AND CYTOTOXIC ACTIVITY OF SHORT-TERM STARVATION IN BREAST CANCER CELLS

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BACKGROUND AND OBJECTIVES
Breast cancer is the most common cancer among women worldwide and a leading cause of cancer-related deaths. Accumulating evidence has demonstrated that energy starvation or deprivation can retard or suppress cancer progression. Lunasin is a seed peptide with potential chemopreventive properties in breast cancer. Therefore, we hypothesize that combining lunasin with short-term starvation (STS) may enhance cancer preventive or therapeutic effects.

METHODS
The STS program was set as culturing the breast cancer cell lines MDA-MB-231 and MCF-7 in a medium containing 1% FBS/1 g/L glucose for 16 hours and then changed to a complete medium (10% FBS/ 4.5 g/L glucose) with 50 μM lunasin for 8 hours. The program was repeated for two days, and then cells and supernatants were collected for analysis.

RESULTS
The RESULTS showed that lunasin and STS alone reduced the viability of MDA-MB-231 and MCF-7 breast cancer cells, while the combination exhibited a synergistic inhibitory effect. In wound healing and colony formation assays, the combination treatment tended to suppress cell migration and colony formation in both cancer cell lines compared to individual treatments, but these suppressive effects were revered in normal mammary epithelial MCF-10A cells. Regarding oxidative stress, the combination treatment significantly increased reactive oxygen species (ROS) levels in cancer cells compared to individual treatments, while it reduced STS-induced ROS elevation in MCF-10A cells. These findings suggest that the selective modulation of ROS levels might enhance cytotoxic properties in cancer cells while protecting normal cells. Other experiments are carried out to explore cell cytotoxicity pathways, such as apoptosis and autophagy.

CONCLUSIONS
The study demonstrated that the combination of lunasin and STS synergistically suppressed breast cancer cell proliferation, migration, and colony formation compared to individual treatments. Moreover, the combination increased oxidative stress in breast cancer cells, which might contribute to cell cytotoxicity. These findings highlight that lunasin combined with STS is a potential chemopreventive strategy against breast cancer.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_015

AN EXPLORATION OF THE FRAMING OF ULTRA-PROCESSED FOODS IN THE UK PRINT NEWS MEDIA, 2022-2023: A THEMATIC CONTENT ANALYSIS

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BACKGROUND AND OBJECTIVES
There has been increasing research and policy attention on the concept of 'ultra-processed foods' (UPFs), with ongoing debate over whether they should be incorporated into nutrition guidelines and policy. The media is known to influence the public's perceptions and policy agenda-setting, yet, how UPFs are being presented in the media is not well understood. There has been an intense focus on UPFs in the UK media recently, making the UK an interesting case study on how framing of UPFs in the media may be shaping public and policy discourse. Therefore, this study aimed to analyse the framing of UPFs in UK newspaper and trade press (2022-2023).

METHODS
We systematically searched UK newspaper and trade press publications for articles which substantively discussed UPFs in 2022-23. After screening, 184 articles were identified and analysed using thematic content analysis. The analysis examined article text for overall position towards the UPF concept (accepted /contested /mixed), and framing theory was used to define distinct frames across the articles by identifying the problem, causes of the problem and potential policy solutions proposed in each article.

RESULTS
The majority of articles accepted the UPF concept (52%), 19% contested the concept and 29% presented a mix of arguments. Five distinct frames were found across the articles. The frames ranged from presenting UPFs as a systemic issue which requires governmental policy action (frame 1), presenting UPFs as an issue for individuals to resolve (frame 2), to questioning the UPF concept (frame 4) and highlighting the benefits of UPFs (frame 5).

CONCLUSIONS
There was a wide variation in the framing of UPFs in the UK media, with proposed solutions ranging from regulatory approaches to address the food system drivers of UPF consumption to industry-centred solutions. As there is ongoing attention on the policy approach to UPFs in the UK and worldwide, these frames and their proposed solutions have the potential to influence the direction of future nutrition policy.

CONFLICTS OF INTERESTS
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EPO1_016

STRATEGIES FOR INCORPORATING BITTER FOODS AND BEVERAGES INTO DIETS

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BACKGROUND AND OBJECTIVES
Higher-quality diets are reported to taste bitter (1), have healthier nutritional profiles, and align more closely with the recommendations of the dietary guidelines (2). Greater consumption of bitter foods and beverages (F&Bs) may benefit health, but most research has focused on green leafy vegetables (3). However, other F&Bs taste bitter and could increase the bitterness of diets if consumed more (2). Yet, strategies to increase bitter F&B consumption and enhance the bitterness of diets remain largely underexplored.

METHODS
An online-based cross-sectional survey of Australian adults was conducted (in July and August 2023) to explore barriers, facilitators, and strategies associated with willingness to try or increase consumption of bitter F&Bs. Eight non-discretionary bitter F&Bs available in the Australian market (including coffee, tea, soda water, Brussels sprouts, rocket, grapefruit, walnuts, and eggplant) were selected. Conceptual models of food choice guided the design of survey questions. Respondents were asked about their familiarity with and consumption habits of bitter F&Bs and their willingness to incorporate more bitter F&Bs into their diets. Respondents were grouped into those who had never tried bitter F&Bs and non-, low-, moderate- or high-consumers.

RESULTS
This study enrolled 879 respondents across Australia. Most respondents (85.4%) were willing to increase their consumption of bitter F&Bs. While the bitter taste was consistently reported as the main barrier to greater consumption, the reported facilitators and strategies varied between consumer groups and the different F&Bs. More than half of the respondents (61.1%) had never tried bitter vegetables. For this group, 'nutrition education' (selected by 34%) and 'appealing presentation' (selected by 25.9%) were the most selected facilitators and preferred strategies, respectively. Non-consumers of other bitter foods in the survey reported 'price' (selected by 43.8%) and 'convenience' (selected by 16.5%) as the most important facilitator and strategy, respectively. While 'food availability' (selected by 39.3%) was the common facilitator among low-consumers of bitter beverages, 'easier preparation' and 'altering the taste' (selected by 19.9% and 17.3%) were the most preferred strategies.

CONCLUSIONS
These findings could help tailor dietary recommendations to groups of individuals based on their consumption habits of bitter F&Bs to support increased consumption. Further research is needed to understand whether improving bitter F&B consumption increases the bitterness of diets overall and whether this is associated with improved health outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_018

SUSTAINABLE NUTRITION FOR ATHLETES: EVALUATING GREENHOUSE GAS EMISSIONS AND WATER FOOTPRINT

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BACKGROUND AND OBJECTIVES
Given the increasing concern about climate change and the environmental impact of nutrition, ensuring sustainability in athletes' diets has become imperative. This study aims to evaluate athletes' knowledge, attitudes, and behaviors regarding sustainable nutrition, particularly in relation to high-protein diets, and assess the sustainability of their food consumption habits in terms of greenhouse gas emissions (GGE) and water footprint (WF).

METHODS
The study utilized a five-section questionnaire that collected data on athletes' socio-demographic characteristics, knowledge, attitudes, and behaviors regarding sustainable nutrition, as well as food consumption frequency. The data from the food consumption frequency form were used to calculate the amount of red meat consumed, as well as the intake of plant-based and animal-based proteins. Additionally, the greenhouse gas emissions (GGE) and water footprint (WF) associated with their food consumption were calculated.

RESULTS
The study was conducted with 100 professional athletes (mean age: 21.0±3.3 years) from various sports disciplines. The average GGE of the athletes' food consumption was 3017.1±1877.4 g CO2 equivalent/g/day, while the average WF was 5.4±3.2 mL/g/day. Athletes who paid more attention to environmental impact labels when purchasing food had higher dietary GGE and WF values ($p<0.05$). Athletes who prioritized ethical production labels when buying food showed significantly higher GGE values in their diet ($p<0.05$). Differences in GGE and WF values were observed based on sports discipline ($p<0.05$). Team sport athletes had lower GGE and WF values compared to other groups, while strength/power athletes had higher values ($p<0.05$). Additionally, differences in GGE and WF were found based on the number of weekly training sessions ($p<0.05$). Athletes who trained 5 times or fewer per week had lower GGE and WF values than those who trained more frequently ($p<0.05$). The average daily red meat consumption per participant was 95.2±11.6 g, with plant-based protein intake at 58.0±32.0 g and animal-based protein intake at 85.9±54.9 g.

CONCLUSIONS
There is a significant relationship between the amount of red meat consumed, the intake of animal and plant-based proteins, and the GGE and WF values of the athletes' food consumption ($p<0.001$). The GGE and WF values of athletes' food consumption are higher compared to the general population. It is essential to promote the consumption of foods with lower GGE and WF values among athletes to encourage more sustainable nutrition practices.

CONFLICTS OF INTERESTS
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EPO1_019

DIFFERENTIATED SERVICE DELIVERY IN NUTRITION INTERVENTIONS: ENHANCING DEMAND AND ACCESS TO INTERGRATED NUTRITION SERVICES IN RESOURCE-CONSTRAINED SETTINGS

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BACKGROUND AND OBJECTIVES

Remote areas in most of the developing countries like Tanzania face significant challenges related to health supply chain inequalities and limited access to health and nutrition services. These issues exacerbate the problem of malnutrition and hinder efforts to achieve towards universal health coverage. Addressing these challenges requires decentralizing service and tailoring approach to meet specific needs of different community groups. This may involve varying the types of services offered, the delivery methods, or the frequency of interventions based on factors like age, nutritional status, or risk level to ensures that each group gets the most appropriate and effective care for their situation.

METHODS

The USAID Lishe (Nutrition) project is implementing community based nutrition and behavior change intervention by making use of the available community platforms such as Community Health Workers and Village health and Nutrition days. The project Provided training to CHWs on Maternal Infant Young Children and Adolescent Nutrition and supported the formation of Nutrition support groups as measure to increase coverage of clients reached through the routine door to door visits by the CHWs. The project also provided technical support to the CHMTs, VEOs and CHWs on how to coordinate and integrate Health, Nutrition, WASH and Agriculture service. During the VHND the project enhance delivery of health and nutrition services such as Vaccination, Deworming, Nutrition counseling and ssessment.

RESULTS

Through the activities conducted above, in Just four month the project managed to trained 178 CHWs in two districts and supported to formulate 3000 Nutrition support groups through which a total number of 7801 (132 male and 7669 male) group members women and 8471 (4043M and 4428F) under five were reached with nutrition education and counseling. On the other hand through VHND the project have reached 49 villages where total number 10855 people attended the event and receive one or more service, 4183 children were assessed for nutrition. As a result of Nutrition assessment 31 under five children with severe acute malnutrition were identified and linked to service for rehabilitation.

CONCLUSIONS

Differentiated Service delivery in Nutrition intervention in resource constrained settings is essential to decentralize service by applying different person centered approached to bring service close to the community as this will help to increase uptake of service and improve behavior change for the target communities. Additionally this approach serves as means for early detection of malnourished children in the community.

CONFLICTS OF INTERESTS

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EPO1_020

DIETARY CARBOHYDRATE INTAKE AND HEALTH-RELATED OUTCOMES: A PROTOCOL FOR THE EVIDENCE EVALUATION METHODOLOGY FOR THE GUIDELINE OF THE GERMAN NUTRITION SOCIETY

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BACKGROUND AND OBJECTIVES

A large body of studies indicates an association between the quantity and quality of dietary carbohydrate intake and various health-related outcomes. The German Nutrition Society (DGE) published its last guideline on dietary carbohydrate intake and selected health-related outcomes in 2011. An update to this guideline is now planned. The following protocol outlines the novel methodical procedure for the updating process.

METHODS

A guideline panel was constituted and research questions were defined a-priori. The methodological approach follows established recommendations for guideline updates.

RESULTS

Umbrella reviews will be conducted to examine the quantity and quality of dietary carbohydrates intake in relation to health-related outcomes in the healthy general population. The relevant interventions/exposures encompass total carbohydrates, sugars (including sugar-sweetened beverages), whole grains, fibre, starch, and the glycemic index and glycemic load of foods as well as dietary insulin index and load. The outcomes of interest are obesity-related outcomes, type 2 diabetes, dyslipidaemia, elevated blood pressure, cardiovascular diseases, cancer and dental caries. A literature search will be conducted in MEDLINE and Epistemonikos from 2015 onwards. Systematic reviews (SR) with meta-analyses of randomised controlled trials and prospective observational studies will be selected based on defined inclusion and exclusion criteria, and data will be extracted from the relevant SR. All steps will be conducted by two independent reviewers. The methodological quality of the SR will be assessed using a modified version of AMSTAR 2, and the certainty of evidence will be assessed using the GRADE approach. The guideline recommendations are derived based on the certainty of the evidence and other criteria of the evidence-to-decision framework.

CONCLUSIONS

The protocol provides a state-of-the-art transparent framework for updating the DGE guideline on dietary carbohydrate intake and health-related outcomes according to international standards.

CONFLICTS OF INTERESTS

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EPO1_021

REVISED DIETARY REFERENCE VALUE OF VITAMIN E INTAKE FOR GERMANY AND AUSTRIA – A NEW PROCESS OF DERIVATION

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BACKGROUND AND OBJECTIVES

The last update of the reference values for vitamin E (VitE) given by the German and Austrian nutrition societies dates back to a 2000 report. Since then, a number of new scientific data has been published especially for α-tocopherol concerning metabolism, biomarkers and relationship between VitE intake and chronic diseases. Therefore, there was a need to review and update of the reference value for VitE intake was required. This paper provides a summary of the work undertaken in this regard.

METHODS

A comprehensive literature search was conducted for human studies on vitamin E, α-tocopherol and γ-tocopherol published since year 2000, focusing on data used to derive a reference value, such as bioavailability, functions, deficiency symptoms and prevention of diet-related diseases.

RESULTS

Stable isotope studies and compartmental models have provided a better understanding of the bioavailability and metabolism of VitE, especially α-tocopherol. The other VitE congeners and an excess of α-tocopherol appear to be increasingly catabolized. In addition, there is no evidence of dietary deficiency or insufficient data on the relationship between PUFA intake or the protection of unsaturated fatty acids and VitE status. Intake data appear to overestimate requirements. We therefore suggest a new approach considering daily losses of approx. 5 mg/d and an average absorption rate of α-tocopherol with a balanced diet of about 75 %, appear to be a solid base for deriving a reference value for VitE intake. Based on this data an intake of about 6.5 mg/d α-tocopherol seems to be sufficient to compensate for daily losses. Due to inter-individual variations, a coefficient of variation of 10 % (which corresponds to an addition of 20 %) should be considered. This RESULTS in an estimated value of 8 mg/d VitE for adults 19 years and older for both sexes. In addition, for this amount of VitE potential beneficial effects have already been reported at dietary intake levels ranging from approximately 2-15 mg/day.

CONCLUSIONS

Adequate VitE intake without supplements is possible with a balanced and plant-based diet because foods with high amounts of PUFA usually also contain VitE in appreciable amounts. The recommendation of a regular/daily consumption of foods rich in VitE appears to be sufficient for an adequate supply of VitE as the preventive effect of higher doses remain to be conclusively proven.

CONFLICTS OF INTERESTS

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EPO1_022

LUNASIN ALLEVIATES MUSCLE ATROPHY AND IMPROVES MUSCLE STRENGTH IN DIET-INDUCED OBESE MICE

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BACKGROUND AND OBJECTIVES

The global prevalence of obesity is continually increasing in recent years, leading to a rise in related health issues. Sarcopenic obesity is characterized by a decrease in lean body mass accompanied by excessive accumulation of adipose tissue, resulting in the loss of muscle mass, strength, and function. It is related to increased risk of insulin resistance, diabetes, and cardiovascular diseases. Lunasin is a soybean-derived seed peptide with multiple bioactivities including anti-inflammatory, antioxidant, and the prevention of immune-related diseases. This study aimed to investigate the effects of lunasin on mitigating sarcopenic obesity in skeletal muscle.

METHODS

C57BL/6 mice were divided into three groups, including normal diet (ND) with 16% calories of fat, high fat and fructose (HF) diet contained 45% calories of fat and 27% of fructose, and the HF diet received 25 mg/kg body weight of intraperitoneally injected synthetic lunasin (HFL) four times a week. The mice were fed the experimental diets from 7-week-old until 14 or 33 weeks-old and were sacrificed for skeletal muscle mass, grip strength, cross-sectional area, and muscle size analyses.

RESULTS

The mice of the HF group increased 25% of body weight and declined fast-twitch muscle weight, including tibialis anterior, extensor digitorum longus, and gastrocnemius, compared to the ND group since 14-week-old. Interestingly, lunasin intervention decreased more than 10% body weight, increased fast-twitch muscle weight, increased skeletal muscle cross-section area, and the proportion of larger myofibers in 33-week-old mice. In muscle strength, the mice of the HF group have lower grip strength at 14- and 33-week-old, and lunasin improved the grip strength in 33-week-old mice.

CONCLUSIONS

This study first highlighted that lunasin intervention alleviated muscle atrophy and improved muscle strength caused by obesity. Additionally, proteins related to muscle generation and degradation, such as MuRF1, atrogin, and myogenin, are currently analyzed to confirm possible molecular mechanisms of lunasin in mitigating obesity-related sarcopenia.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_024

PERCEPTIONS OF BODY SHAPE AND NUTRITIONAL INTAKE OF FEMALE UNIVERSITY STUDENTS IN TOKYO

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BACKGROUND AND OBJECTIVES
Previous studies have pointed out that the proportion of underweight women in Japan is 16%, which is higher than in other countries (Phelps et al., 2024). According to previous studies, one of the factors explaining this tendency among Japanese women is that "their weight perception is heavier than their actual weight or 'desirable weight'". In addition, the National Health and Nutrition Survey of Japan reported that young Japanese women have low energy intake, which may contribute to thinness. The purpose of this study is to investigate the actual proportion of underweight women among female university students, their perception of their body image, and their current nutritional intake, and to collect data to consider ways to reduce the proportion of underweight women.

METHODS
A survey was conducted on 93 female university students at a women's university in Tokyo (mean age: 19.2 ± 3.0 years, mean height: 158.1 ± 5.2 cm, mean weight: 50.6 ± 5.6 kg). Participants completed a body image questionnaire and a dietary survey. Data from 93 participants were analyzed for the body image questionnaire, and data from 48 participants were analyzed for the dietary survey. The dietary survey was conducted using a food frequency questionnaire (FFQ) and compared with the Japanese dietary reference intake values.

RESULTS
In the body image survey, 18 of 93 participants (19.4%) had a BMI of less than 18.5 kg/m². Regarding their own body shape, 25 participants answered that they were “overweight”. The average ideal body weight was 47.5 ± 4.6 kg, and 34 participants (36.6%) answered that their ideal body weight corresponded to a BMI of less than 18.5 kg/m². In the dietary survey, the estimated average energy requirement is 2000 kcal, but only 1666 ± 28 kcal was took.

CONCLUSIONS
A survey conducted on female university students in Tokyo revealed that 19% of the participants were underweight. As with previous studies, it was shown that there is a high possibility that they do not have an appropriate awareness of their current body shape and ideal body shape. Furthermore, this study confirmed that insufficient energy intake contributes to the increase in underweight.In the future, we would like to investigate the causes of the acquisition of incorrect perceptions about body shape, as well as consider ways to establish correct perceptions and improve dietary content.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

1. Worldwide trends in underweight and obesity from 1990 to 2022: a pooled analysis of 3663 population-representative studies with 222 million children, adolescents, and adults

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EPO1_025

IODINE DEFICIENCY: THE RENAISSANCE OF A PUBLIC HEALTH ISSUE IN SUSTAINABLE NUTRITION?

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BACKGROUND AND OBJECTIVES
The implementation of cost-effective public health strategies to enhance iodine status, such as the utilisation of iodised salt and fortification of animal feed, has resulted in a notable improvement in iodine status in previously iodine deficient populations, including Germany, Austria and Switzerland. However, in line with the principles of a healthy and ecologically sustainable diet, it is now recommended to decrease the consumption of animal-based foods, particularly fish and dairy products which are important dietary sources of iodine. In addition, a reduction in salt intake for the prevention of hypertension is advised, which may RESULTS in a decline in iodine intake. The objective of this paper was to evaluate the iodine supply by sustainable and salt-reduced diets and to derive recommendations for improving the iodine supply of the population.

METHODS
A literature search on the dietary iodine supply of different population groups in the context of a sustainable diet was performedand the effect c the exclusion of dairy products or a vegan diet was evaluated.

RESULTS
The adherence to a sustainable diet which is characterized by a reduced consumption of animal-based foods may result in an inadequate iodine supply for vulnerable groups, including children, adolescents, pregnant and breastfeeding women. This is due to the exclusion of dairy products, lack of iodine fortification of plant-based dairy alternatives, and insufficient use of iodised salt in processed foods. This may lead to an increasing prevalence of individuals with inadequate iodine intake and in the long term to adverse health outcomes and rising healthcare costs for society.

CONCLUSIONS
Public health policies that promote sustainable diets and reduce salt intake must be combined with (salt) iodization efforts. In the case of iodine, there is an elevated risk for insufficient supply by a sustainable and salt-reduced diet. For Germany, the following actions are proposed to improve the iodine supply of the population: the enhanced use of iodised salt in processed foods including organic foods, increasing the iodine content of table salt, using iodised salt in communal catering, a mandatory iodine fortification of plant-based milk alternatives and a regular iodine monitoring to determine the iodine status in the population.

CONFLICTS OF INTERESTS
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EPO1_026

ILEAL PROTEIN DIGESTIBILITY OF FAVA BEANS EXTRUDATE IN HEALTHY HUMANS

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BACKGROUND AND OBJECTIVES
Favouring the consumption of plant proteins has been identified as a key leverage to reduce the environmental impact of food production. High moisture extrusion is a processing technology commonly applied to mimic the structure and texture of meat. However, knowledge about the nutritional quality of such products is limited. Hence, we evaluated the true protein digestibility of a fava bean meat analogue obtained by high moisture extrusion in healthy adults.

METHODS
After overnight fasting, seven volunteers (five males and two females, mean age: 35 ± 13 years, mean body mass index: 25 ± 2.5 kg/m2) equipped with a naso-ileal tube received a test meal containing 81 g of 15N-labelled fava bean extrudate (equivalent to 290 mmol of nitrogen), panfried with 15 g sunflower oil to which agave syrup was added. Following ingestion, ileal, plasma, and urine samples were collected for eight hours, in which nitrogen, amino acids, and urea were quantified. In these fractions, 15N enrichment was quantified in bulk and in individual amino acids using isotopic ratio mass spectrometer. Concomitantly, polyethylene glycol was perfused as a non-absorbable marker in the ileum via the naso-ileal tube to determine the ileal flow rate.

RESULTS
The total amount of undigested dietary nitrogen recovered after eight hours at the ileum reached 53.7 ± 9.7 mmol, resulting in a true ileal digestibility of nitrogen of 81.5 ± 3.2 %. Over eight hours following ingestion, 17.9 ± 6.6 mmol of dietary nitrogen were recovered in urinary urea, while 31.8 ± 10.2 mmol were still present in body urea after eight hours post-ingestion. Summing these deamination losses with digestive losses allowed the net postprandial protein utilization (NPPU) calculation, which was 64.4 ± 5.5 %.

CONCLUSIONS
The ileal nitrogen digestibility from fava bean extruded meat analogue was moderate. Both ileal nitrogen digestibility and NPPU were comparable to the values previously reported for cooked and dehulled fava beans (Itkonen et al., 2024). The present RESULTS need to be complemented with individual amino acid digestibility to assess further the nutritional quality of proteins from fava bean extruded meat analogues.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_028

ABILITY OF THE UPDATED NUTRI-SCORE TO DISCRIMINATE THE NUTRITIONAL QUALITY OF PRE-PACKAGED FOOD IN CHINA AND CONSISTENCY WITH NUTRITIONAL RECOMMENDATIONS OF CHINESE DIETARY GUIDELINES

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BACKGROUND AND OBJECTIVES
The front-of-pack labelling (FOPL) Nutri-Score is a complementary nutritional information system that can inform the consumers of the nutritional value of food, prompt healthier food choices, thus promoting reformulation in the food industry. In contrast, on the Asian side, scientific research on this topic is lacking. This study aims to evaluate the nutritional quality of Chinese prepackaged food using the matrix of Nutri-Score, and to provide practical reference for the establishment of relevant FOPL in China.

METHODS
Contents of energy, fat, sodium, sugar, protein and data of ingredients were extracted from 8656 prepackaged food and their labels of 20 categories, calculated according to the FSAm-NPS nutrient profiling system, before graded A-E, to profile the nutritional quality of prepackaged food in China.

RESULTS
In terms of FSAm-NPS score, foods in this study fell into the range of 17.8±10.1. Among them, 59.1% scattered across Grade A-E, and 86.7% across 3 different grades. The RESULTS showed that the Nutri-Score system is able to profile prepackaged food in China. In particular, the nutritional quality of nut seeds, milk and ready-to-eat cereals is better than that of processed meat products, puffed foods and pastries.

CONCLUSIONS
Nutri-Score can be used to profile the nutritional quality of most prepackaged foods in China, with some categories as exceptions. It is necessary to adapt the selection of indexes and calculation method to the relevant nutrition recommendations, reference intake and other local conditions in China, thus better guiding Chinese residents in making healthier and science-based consumption choices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_030

ALIGNING ACTION WITH POLICY: EVALUATING COMPLIANCE OF MINISTRIES, DEPARTMENTS AND AGENCIES (MDAS) AND LOCAL GOVERNMENTS (LGS) TO PLANNING, BUDGETING AND IMPLEMENTATION PER THE UGANDA NUTRITION ACTION PLAN II (UNAP II)

Elisha Nangosha[1]; Shirley Kansabe[1]; Tracy Lukiya Birungi[1]; Edward Linton Onekalit[1]; Peterson Kikomeko Kato[1]; Joweria Nambooze[1]
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BACKGROUND AND OBJECTIVES
The Certificate of Compliance (CoC) for the FY 2022/23 Annual Budgets assessed the alignment of Uganda's national budgets with the Uganda Nutrition Action Plan II (UNAP II) and the Third National Development Plan (NDPIII). The assessment sought to evaluate compliance of Ministries, Departments, and Agencies (MDAs) and Local Governments (LGs) with UNAP II; identify gaps in planning, budgeting, and implementation for nutrition-sensitive interventions and; to provide actionable recommendations to enhance alignment with national and international nutrition targets.

METHODS
This study employed a cross-sectional design and focused on four levels: national, sectoral/Ministries, Departments, and Agencies (MDAs), and Local Government (LG). Compliance was evaluated on strategic planning/budget framework papers/ ministerial policy statements, and Annual performance which also served as data sources.

RESULTS
Preliminary RESULTS revealed low alignment, with MDAs averaging 22.6% in strategic planning and 22.7% in performance. The Ministry of Health scored highest with 36.4% in planning and 60.0% in performance, while the Ministry of Trade, Industry, and Cooperatives had 0.0% in planning and 11.5% in performance. Moderate performers included the Ministry of Agriculture, Animal Industry, and Fisheries (32.4%/29.4%) and Kampala City Council Authority (12.1%/18.0%). Several MDAs lacked assessment, highlighting gaps in nutrition planning, resource allocation, and execution. These findings underscore the need for improved coordination and capacity to achieve UNAP II targets.
The FY2022/23 Certificate of Compliance on UNAP II revealed unsatisfactory performance among local governments, with an overall average compliance score of 14.2% for strategic planning and 6.6% for performance. Napak District scored highest (58.8%/16.7%), while several districts, including Nwoya, Kamuli, and Lira, recorded 0% performance. Regional disparities were evident, with Karamoja leading at 16.8%/10.8% and Busoga scoring the lowest at 14.0%/0.0%, underscoring the need for improved planning and execution of nutrition-sensitive interventions.

CONCLUSIONS
The CoC assessment underscores critical gaps in Uganda's approach to integrating nutrition into national and local development frameworks. Once addressed, Uganda can accelerate progress toward its national nutrition and development targets, thereby contributing to the achievement of the NDP IV, Vision 2040 and the Sustainable Development Goals (SDGs).

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_031

VITAMIN D NUTRITIONAL STATUS IN MIDDLE EAST REGION : A META ANALYSIS

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BACKGROUND AND OBJECTIVES
Adequate vitamin D status is crucial for health, especially for skeletal health. The prevention of vitamin D deficiency disorders represents a major public health concern. Several studies conducted in the Middle East region have reported surprisingly high vitamin D deficiency prevalences, despite high sunlight availability and considered adapting dietary and lifestyle recommendations, as well as fortification policies.
The present study aimed at getting a clearer picture of the vitamin D nutritional status in the Middle East region using a meta-analysis approach.

METHODS
This meta-analysis included 44 studies evaluating serum vitamin D levels in healthy Middle Eastern adult populations, using pooled analyses and meta-regressions to assess the overall levels, the differences between men and women, and the impact of covariates such as age and BMI.
Both raw and imputed data were analyzed to allow the inclusion of the maximum number of studies in the different analyses.

RESULTS
The RESULTS presented show significant disparities in vitamin D status between different countries in the Middle East region.
The meta-analysis found an overall mean serum vitamin D concentration of 45.65 nmol/L (below the recommended cut-off of 50 nmol/L), with a 3.92 nmol/L higher level in men compared to women, and no significant impact of age or BMI on these parameters.

CONCLUSIONS
This meta-analysis provides a comprehensive assessment of vitamin D status in Middle Eastern populations, highlighting the widespread vitamin D deficiency in the region, with potential gender differences, but no clear impact of age or BMI - findings that can inform targeted public health strategies to improve vitamin D nutrition in this part of the world.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_034

DUTCH APPROACH FOR HOUSEHOLD FOOD WASTE PREVENTION: 5 STEPS TO CREATE SCIENCE BASED AND EFFECTIVE STRATEGIES

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BACKGROUND AND OBJECTIVES

Reducing food waste is one of the key strategies to fight climate change and feed the growing world's population. For this reason, the European Union and the Dutch government have committed to Sustainable Development Goal (SDG) 12.3, which sets a target of halving per-capita food waste at the retail and consumer levels by 2030 compared to 2015. The problem of household food waste has proven difficult to eradicate. There is no silver bullit to solve the problem. We need science based and effective strategies to prevent food waste at household level.

METHODS

There are 5 crucial steps to generate science based and effective strategies in the Dutch approach to tackle household food waste: 1. Create a scientific framework, 2. Focus on high-impact strategies, 3. Design an intervention respecting a diversity of factors, 4. Encourage joint implementation and 5. Evaluate to optimise.

RESULTS

There are several best practices on food waste prevention via the 5 step approach. Examples include, but are not limited to:

- Dutch National Food Waste Free week: it is a collaboration between over 150 partners nation-wide to show the positive movement against food waste and provide action perspective. Research in 2023 showed that 5 million (35% of the Dutch population) did something extra to prevent food waste during this week.
- A wide range of kitchen tools: The aim was to create a kitchen environment that makes it easier for people to waste less. Use it up tape (28% less food waste) and a tool-box (23-39% less food waste) including a measuring cup and fridge sticker were developed and implemented widely.
- Campaign and coalition on date labels: Studies show that extra communication on packaging can improve consumers' understanding of the difference between the 'best before' and 'use by date'. Together with retailers and manufacturers we clarify date marking with icons, additional text on packaging and campaigns.

CONCLUSIONS

We have to create a society in which wasting less is the easy and obvious choice.
The responsibility for waste reduction should not entirely lie on consumers shoulders, but there are opportunities in the food chain as a whole. We can all help consumers to make 'food-waste free' the new norm. We believe this can be achieved when we focus on science based effective strategies.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_035

DESIGNING INCLUSIVE NUTRITION TRIALS: ADDRESSING BARRIERS TO ANTENATAL CARE AND DIETARY PATTERNS IN RURAL RWANDA

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BACKGROUND AND OBJECTIVES
Current nutrition recommendations often lack sufficient evidence from all populations, particularly pregnant women in low- and middle-income countries and marginalized groups, whose dietary needs are critical for maternal and child health outcomes. However, persistent barriers to participation in nutrition trials during pregnancy, including delayed engagement in antenatal care and complex dietary behaviors, limit the generalizability of findings. To address this gap, formative research was conducted prior to launching a randomized controlled trial to understand barriers and provide actionable insights for designing nutrition intervention trials tailored to the needs of pregnant women.

METHODS
We explored barriers to antenatal care and women's dietary habits through semi-structured interviews and focus group discussions with mothers, pregnant women, community health workers (CHWs), men and fathers, as well as other healthcare professionals. Qualitative data were collected in rural Nyagatare District, Rwanda from July through August 2023, and included 59 interviews and 30 focus group discussions. The data was analyzed using MAXQDA software.

RESULTS
Inductive content analysis identified six key themes influencing delayed pregnancy detection and reduced attendance at antenatal visits: financial constraints, time constraints, uncertainty surrounding pregnancy status, superstitions about pregnancy, lack of family support, and challenges in motivation and decision-making for care. Further analyses are underway to identify dietary patterns and explore potential overlaps with these barriers.

CONCLUSIONS
By understanding these barriers and habitual dietary patterns, this work offers a framework to enhance diverse participant engagement and retention in trials. This study exemplifies translational science by transforming formative research findings into practical strategies for trial design. By using qualitative methods to explore the interconnected challenges of accessing antenatal care and maintaining dietary habits, this research highlights overlapping factors that can inform inclusive trial strategies. These findings have the potential to increase intervention adherence and generalizability of trial findings, ultimately shaping the next generation of nutrition recommendations during pregnancy.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_036

ON WHAT BASIS THE REQUIREMENTS AND RECOMMENDATIONS OF VITAMINS IS TO BE DETERMINED?

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BACKGROUND AND OBJECTIVES
For determining the nutrients requirement, clinical or epidemiological evidences for the individual vitamins are essential, but unsatisfactory by itself. On what basis to determine it is a fundamental issue, but has been little studied for vitamins. Then in this study, we propose the research questions to be answered for such purpose.

METHODS
References regarding the vitamins' requirements were reviewed; Dietary Reference Intakes (DRIs) from various countries including USA (National Academies Press; NAP), European Food Safety Authority (EFSA), series of publications from NAP such as "Guiding Principles for the Inclusion of Chronic Disease Endpoints in Future". Publications other than DRIs such as Biomarkers of Nutrition for Development (BOND) were also reviewed.

RESULTS
We have noticed the following problems. First, the theoretical basis for defining DRIs considering the chronic diseases from NAP has been applied to sodium and potassium, but not to vitamins yet.
Second, requirement has been individually studied for each vitamin, but the common theoretical basis applicable to all vitamins has not been established. We consider that the following question must be answered with high priority. 1. Although the determination of vitamins' requirement must be evidence based, evidence alone is unsatisfactory, and the basis or the position based on which the determination is made. Vitamin insufficiency, milder than deficiency, is a risk of various diseases. Vitamins' requirement greatly varies depending on whether aiming the prevention of deficiency or decreasing the disease risk by correcting the insufficiency. 2. Recently, nutritional biomarkers are classified into exposure, status, and function according to their roles. Although biomarkers are quite suitable surrogate indicators of vitamin status, their appropriate evaluation employing such classification has not been done for vitamins. 3. The theoretical basis for determining the cut-off value of biomarkers has little been argued. 4. Regarding the association between the vitamins status and disease risk, quite often there exist marked discrepancies; robust association in the observational studies and null RESULTS in the intervention studies. "What is the appropriate evidence in evidence-based nutrition?" is an urgent question.

CONCLUSIONS
For the scientific determination of vitamins' requirements and recommendations, arguing the theoretical basis and the efforts to establish the consensus is mandatory in addition to the studies on individual vitamins.

CONFLICTS OF INTERESTS
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EPO1_037

THE RELEVANCE OF MATHEMATICAL OPTIMIZATION AS A TOOL FOR DIET MODELING IN THE DEVELOPMENT OF FOOD-BASED DIETARY RECOMMENDATIONS IN SUB-SAHARAN AFRICA: A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES
Sub-Saharan African countries (SSA) experience malnutrition linked to unhealthy diets and certain unfavorable trends in food consumption patterns. Although mathematical optimization has proven to be a valuable tool in informing food-based recommendations (FBRs) to promote healthier diets, its application in resource-limited settings such as SSA remains underexplored despite an emerging body of evidence. This scoping review aims to address this gap by synthesizing recent evidence on the role of mathematical programming in developing FBRs in SSA, identifying current limitations, and highlighting opportunities for advancing evidence-based dietary interventions.

METHODS
Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses- Extension for Scoping Reviews (PRISMA-ScR), a systematic search of PubMed and Web of Science databases (2000–2024), complemented by citation tracking, identified 97 relevant studies. Of these, 30 studies spanning 12 SSA countries met the inclusion criteria. Kenya accounted for the highest representation (n=9), followed by Ghana and Ethiopia (n=4 each), Uganda (n=3), Malawi and Tanzania (n=2 each), and one study each from Benin, Burkina Faso, Mozambique, Niger, South Africa, and Zambia.

RESULTS
The reviewed studies were leveraged on linear programming (LP) or extensions of LP (i.e., linear goal programming) to formulate FBRs by optimizing the current dietary patterns to meet nutritional needs and gaps (n=24), to develop nutritionally and culturally optimized and cost-minimized food baskets (n=4), and to describe the use of LP as a method for designing population-specific food-based dietary guidelines (n=2). The formulated FBRs and optimized diets are often limited to specific demographic groups, with a limited geographic scope reflecting a regional priority. Diets can be optimized both nutritionally and economically by prioritizing locally available food groups and items; however, in some cases, additional supplementation may be necessary.

CONCLUSIONS
The reviewed studies emphasize the potential of LP to support evidence-based, context-specific FBRs and interventions in SSA, facilitated by the availability of user-friendly software. However, LP alone may not fully account for behavioral and practical aspects of food consumption. High-quality input data and incorporating sociocultural contexts will be critical for leveraging mathematical optimization to inform inclusive and effective dietary recommendations in SSA.

CONFLICTS OF INTERESTS
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EPO1_039

THE BIOAVAILABILITY OF IRON IN AUSTRALIAN VEGETARIAN AND OMNIVOROUS DIETS

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BACKGROUND AND OBJECTIVES
Maintaining iron balance is crucial for preventing deficiency and its related symptoms. While vegetarian diets (VegDiets) can provide comparable dietary iron to omnivorous diets (OmniDiets) when well-planned, VegDiets lack animal flesh and contain more iron absorption inhibitors (e.g., polyphenols, phytates). This reduces bioavailability and absorbable iron, often resulting in lower iron status. This study evaluated dietary iron adequacy and bioavailability in Australian adults following VegDiets or OmniDiets.

METHODS
Data were analyzed from 12,153 participants in the 2011-12 National Nutrition and Physical Activity Survey. Adults (n = 7,612; 53% female; 18-85 years) were included after excluding those aged under-18, pregnant/lactating individuals, and under-reporters (n = 4,541). Usual iron intakes were estimated using the multiple source method, and the prevalence of inadequacy was assessed via the full probability method. The Monsen & Balintfy algorithm estimated bioavailability and absorbable iron from VegDiets and OmniDiets across various eating occasions. Analyses were conducted using Stata survey commands.

RESULTS
308 Adults followed VegDiets and 7,304 followed OmniDiets. VegDiets provided 8.8 and 8.5 mg/d [95% CI: 8.4 - 8.6 mg/d] by OmniDiets. Inadequacy of dietary iron intakes was 71% [95% CI: 65.5% - 75.7%] for VegDiets and 17% [95% CI: 16.1 - 17.9%] OmniDiets (p-value for difference <0.001). In a subgroup analysis of Female OmniDiets (Age 19-49), 47% [95% CI: 44.8 - 49.2%] had inadequate iron intake. Iron bioavailability in male VegDiets and OmniDiets was 4.6% [95%CI: 4.4 - 4.8%] and 7.2% [95% CI: 7.1 - 7.2%], respectively. Mean bioavailability for female VegDiets and OmniDiets was 4.5% [95%CI: 4.4 - 4.7%] and 6.5% [95%CI: 6.4 - 6.5%], respectively (p-values for difference: <0.001). Mean absorbable iron for male VegDiets and OmniDiets was 0.8 mg/d [95%CI: 0.6 - 0.8 mg/d] and 1.1 mg/d [95% CI: 1.1 - 1.1 mg/d], respectively. Mean absorbable iron for female VegDiets was 0.5 mg/d [95% CI: 0.5 - 0.6 mg/d] and 0.8 mg [95% CI: 0.8 - 0.8 mg/d], respectively (p-values for the difference between diets: <0.001).

CONCLUSIONS
More than two-thirds of those who follow VegDiets, and almost half of females consuming OmniDiets have inadequate iron intake. Iron bioavailability and absorbable iron are lower in VegDiets compared to OmniDiets for both sexes. These findings have implications for Australians consuming VegDiets and females following OmniDiets to improve and optimize iron intake and its absorption.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_040

SALT REDUCTION 2030 TARGETS, STRATEGIES AND MEASURES IN CHINESE FOOD INDUSTRY

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BACKGROUND AND OBJECTIVES

Excessive salt intake is a significant risk factor for diseases such as hypertension, stroke, and stomach cancer. Salt reduction is the most cost-effective public health strategy for preventing hypertension. Salt reduction 2030 targets will provide guidance on healthy lower sodium/salt foods, support the government and relevant administrative departments in managing food manufacturers, provide advice to consumers on purchasing and consuming lower sodium/salt foods.

METHODS

This study is based on the pre-packaged food nutrition label survey conducted by the Chinese Center for Disease Control and Prevention. It analyzes the distribution range of sodium content in various types of foods, combines the RESULTS obtained from consumer questionnaires, sets salt reduction targets, conducts research on food salt reduction technology,in order to formulate the salt reduction targets, strategies and measures in Chinese food industry.

RESULTS

The Guidelines propose four fundamental principles, seven pathways and steps, five specific methods and measures, and recommendations for fostering a supportive social environment to guide the gradual reduction of sodium/salt content in China's processed foods and promote low-salt foods. Using the sodium content distribution data from various food categories collected in 2022 as a baseline, the Guidelines set forth two phased salt-reduction targets based on a step-by-step approach:By 2027, strive to achieve an overall reduction of 5%-10% in the sodium content of various processed foods.By 2030, continue to reduce the sodium content of processed foods by another 5%-10%.Efforts to reduce sodium in the food industry should consider the unique characteristics, types, and varieties of food products. This involves advancing technical research support, enhancing innovation in sodium-reduction technologies, and gradually establishing and improving national or industry policies, regulations, and standards related to low-sodium salts and salt substitutes. Additionally, fostering a supportive social environment for sodium reduction across all sectors is crucial.

CONCLUSIONS

The updating and publication of this Guideline in 2024 will provide scientific and feasible technical guidance on salt reduction for food production enterprises and related staff, set nutrition-oriented food processing standards and objectives, create a healthy diet culture and policy environment, and also provide safeguard support for promoting consumer health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_041

OPTIMAL DIETARY QUALITY AMONG PREGNANT WOMEN IN A FOOD-RICH LOCALE; CALLS FOR EFFORTS TO ADDRESS ITS DETERMINANTS

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BACKGROUND AND OBJECTIVES
Optimal diet quality during pregnancy has long-lasting effects on child health and development. Despite various interventions, children and women of reproductive age continue to suffer from a high burden of chronic undernutrition including micronutrient deficiencies even in food-rich regions. Evaluating diet quality during pregnancy offers a golden opportunity to address maternal nutrient adequacy and can help to design tailored and population-wide interventions. This study investigated optimal dietary intake and assessed determinants for diet quality among pregnant women.

METHODS
A cross-sectional study was conducted between July and August 2024 among 399 pregnant women (≥ 20 gestational week) attending antenatal care in one of the food-rich regions. The dietary intake was assessed using a food frequency questionnaire. FAO's Minimum Dietary Diversity for Women (MDD-W) index was used to assess dietary diversity, with 5/10 food groups used as a cut-off for the minimum recommended diet. The consumption of 21 healthy and unhealthy food groups was assessed using Prime Diet Qulity Score (PDQS) ranging from 0-42.

RESULTS
The mean age of the study participants was 25.7±6.2 years, and their mean gestational age was 27.3±5.6 weeks. The multigravida accounted for 69.1% of the study participants while 30.9% were primigravida. Among the pregnant women, 38.3% had completed secondary or higher education. Only one in three attained a minimum dietary diversity score and the median PDQS among pregnant women was 17(IQR 15 - 20). While cereal-based foods were universally consumed, only 16% of pregnant women consumed eggs, and 10.3% other vitamin A-rich fruits and vegetables. Women with secondary or more formal education (AOR=1.7:95%CI:0.6-4.4) and multigravida (AOR=2.9:95%CI:1.4-6.1) were more likely to meet the MDD recommendation compared to those with little or no formal education and primigravida respectively.

CONCLUSIONS
Achieving dietary quality and diversification among pregnant women is still a challenge. This study highlights the importance of educating women or ensuring they attend school as a necessary approach that should be strengthened to address nutrition and health challenges. Efforts are needed to address this unprecedented burden with focus among primigravida and women with low levels of education in this region and others with similar contexts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_042

A PERSPECTIVE ON THE VALIDITY OF USING JONES FACTORS TO CALCULATE PROTEIN CONTENT

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BACKGROUND AND OBJECTIVES
Protein-rich foods from animal origin are the most expensive part of consumers' food baskets today. Not only does protein contribute energy to the diet as an essential macronutrient, but it also contributes essential and non-essential amino acids to the diet. Protein content in food is calculated from the nitrogen concentration (determined by Kjedahl or Dumas method) of the food using a nitrogen-to-protein conversion factor - the Jones factor, specific for certain foods. The most commonly used Jones factor is 6.25, which assumes that protein contains 16% nitrogen.

METHODS
In this study, the amino acid content of high-protein foodstuffs (meat, dairy and protein supplements) was analysed (using high-performance liquid chromatography) and the protein content was calculated in two ways. First, using the respective Jones factors and secondly by using the sum of the amino acid residues.

RESULTS
The protein content was over-reported when using the Jones factor. For meat and the supplements, the difference was statistically significant ($p \leq 0.05$). Genetic variability and seasonality in foodstuffs and the effects of how protein sources are produced and processed may to a certain extent explain the discrepancies between values determined for the same type of foodstuff. The more accurate method to determine protein content is to hydrolyse protein to their component amino acids which can then be quantified. The sum of the amino acid residues will represent the protein content of the food. This should be the preferred approach to quantify proteins in foods.

CONCLUSIONS
However, the indirect analysis using the total nitrogen content of the food multiplied by a conversion factor will still be used as it is more cost-effective and requires less sophisticated analytical instrumentation and skill. Therefore, more discussion is recommended on the updating and application of Jones factors.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_044

PHYTASE ADDITION TO IMPROVE NUTRIENT BIOACCESSIBILITY IN CEREAL-LEGUME BASED FOOD PRODUCTS

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BACKGROUND AND OBJECTIVES
Over 3 billion people suffer from micronutrient deficiencies, with one-third experiencing anemia and zinc deficiency, particularly in low- and middle-income countries. High levels of phytic acid in plants, which contribute significantly to daily caloric intake, prevent the absorption of essential minerals, leading to mineral deficiency and ultmately, malnutrition. Phytase, an evidence-based solution, breaks down phytic acid, enhancing the absorption of calcium, zinc, iron, and other minerals. The objective of the study is to enhance the nutritional bioaccessibility of cereal-legume based food products by adding phytase, while ensuring safety and cost effectiveness.

METHODS
We studied the impact of adding phytase to cereal-legume-based foods in two steps. In the first step of formulation development and evaluation, Phase 1 focused on formulating phytase-enriched products through dosage optimization and blending validation strategies. Phase 2 evaluated the efficacy of phytase enrichment, and Phase 3 assessed the sensory attributes of the enriched foods. In the second step of performance assessment, we used an in-vitro gastrointestinal digestion assay to determine nutrient bioaccessibility. The analysis included studying the impact on phytic acid content, residual phytase activity, nutrient content, and nutrient absorption.

RESULTS
The study demonstrated that the addition of phytase reduced phytic acid levels by at least 60% in products, while maintaining nutrient content and ensuring residual phytase levels remained below limits defined by good manufacturing practices, all in a cost-effective manner. Key learnings from the study revealed that iron starts becoming bioaccessible when phytic acid is reduced by more than 60%, although the RESULTS vary depending on the product format, the initial phytic acid level, and the iron content. Additionally, the intervention achieved at least a two-fold improvement in mineral absorption by attaining the ideal phytate-to-mineral molar ratio

CONCLUSIONS
Improving nutrient bioavailability with the same food quantities or nutrient levels provides a sustainable and cost-effective approach to combating global micronutrient deficiencies. Sensory evaluations demonstrated high consumer acceptance, highlighting the potential for seamlessly integrating this solution into existing food systems.

CONFLICTS OF INTERESTS
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EPO1_046

MEDIUM-CHAIN TRIGLYCERIDE SUPPRESS THE RISE IN BLOOD GLUCOSE LEVELS AFTER MEALS

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BACKGROUND AND OBJECTIVES
Postprandial hyperglycemia is known as a risk factor for diabetes1). Additionally, the number of diabetes patients aged 65 and older is increasing2). In Asia, rice is a staple food, but it is known to have a high glycemic index (GI)3). Therefore, we observed postprandial blood glucose fluctuations after rice consumption and explored methods to suppress postprandial blood glucose levels that could be feasible even for frail elderly individuals. This study was conducted with the approval of the Prefectural University Hiroshima Ethics Committee.

METHODS
The trial involved 32 university students who consumed either 150g of plain rice (232 kcal, 0.1g fat) or 150g of rice with 8% medium-chain triglycerides (MCT) added 12g (340 kcal, 12.1g fat) as breakfast within 10 minutes. Blood glucose levels were subsequently measured.
Each participant consumed plain rice first, followed by the MCT rice two days later. Blood glucose levels were measured using the FreeStyle Libre device, starting at 0 minutes from the beginning of consumption and continuing every 15 minutes up to 120 minutes to observe fluctuations.

RESULTS
RESULTS showed that both groups reached a peak in blood glucose levels at 45 minutes post-meal. However, the MCT rice resulted in significantly lower blood glucose levels at 45 and 60 minutes post-meal compared to plain rice. The incremental area under the curve (iAUC) for 0–30 minutes and 0–60 minutes was significantly smaller with the MCT rice.

CONCLUSIONS
These findings suggest that while providing energy, the rise in blood glucose levels can be suppressed, indicating potential applications for patients with frailty or sarcopenia among the elderly.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_047

DIET AND LIFESTYLE MEDICINE IN ORTHOPEDICS

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BACKGROUND AND OBJECTIVES

Lifestyle Medicine is an evidence-based medical specialty that uses therapeutic lifestyle interventions and behaviors as a prevention of various chronic conditions, such as obesity, type-2 diabetes, cardiovascular and neurodegenerative diseases and some types of tumors. Besides, there is evidence that Lifestyle Medicine pillars individually can improve age-related pathological musculoskeletal conditions. The most common ones are: sarcopenia (progressive loss of skeletal muscle mass and strength), osteoporosis (gradual bone mass decrease), osteoarthritis (the most prevalent joint degenerative disease), inflammatory episodes (tendinitis, bursitis) and chronic pain on a substrate of silent chronic inflammation. However, there are very few studies that suggest diet and lifestyle strategies for improving musculoskeletal health of orthopedic patients.

METHODS

We present the FACILE (=easy) diet, whose initials are the explanatory evolution of the Mediterranean diet: Flexitarian, Accessible, Conscious, Individualized, Lifelong, Eco-sustainable. It is not only a healthy eating pattern that contributes to the reduction of silent chronic inflammation and oxidative stress. Instead, it should be considered as nourishment and as part of a wider healthy way of living, which includes increased physical activity, improvement of sleep, development of stress-management, cultivation of positive relationships, avoidance of risky substances.

RESULTS

Healthy eating and lifestyle patterns can contribute to a better musculoskeletal health, improving patients' independency and quality of life, and preventing frailty, falls, fractures, hospitalization and death. These strategies can prevent sarcopenia, osteoporosis, osteoarthritis; they can support patients under conservative treatment; they can improve musculoskeletal health of patients who undergo elective orthopedic surgeries, playing an important role in the pre-rehabilitation; they can amplify the effects of postoperative rehabilitation, further improving surgical outcomes.

CONCLUSIONS

A new type of collaboration between orthopedists (who mostly use the expert approach) and nutritionists (who prefer the coach approach) is essential in order to promote healthy nutritional and lifestyle education. When orthopedic patients are supported, informed and empowered, they are intrinsecly motivated to change. This is the engine that can accompany them throughout their lives, mantaining a musculoskeletal health overtime, contributing to healthspan.

CONFLICTS OF INTERESTS

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EPO1_048

EFFECTS OF MATERNAL EXPOSURE TO A MIXTURE OF FOOD CHEMICAL CONTAMINANTS ON FETOPLACENTAL DEVELOPMENT (SYMPOSIUM BIOSPHERA)

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BACKGROUND AND OBJECTIVES

Pregnant women are daily exposed to food chemical contaminants that can affect the fetoplacental development with long-term effects on offspring health. Using the RESULTS of the SEPAGES mother-child cohort urine dosages, a mixture of eight compounds from phenol, phthalate, and paraben families (PPPs) were defined for their association with health effects on offspring. Based on these data, the present study aimed to mimic maternal exposure to this mixture of three phenols, one paraben and four phthalates to assess the impact on fetoplacental development in a rabbit model.

METHODS

Female rabbits were orally exposed daily to a mixture of PPPs (PPP group) or to the vehicle (C group) from two months preconception to the end of gestation, i.e. 90 days of exposure. Maternal blood biochemistry was performed before conception and at the end of gestation. Ultrasound and Doppler measurements were performed to explore fetoplacental development and placental vascularization. At 28 dpc, maternal and fetoplacental tissues were collected for biometry. Placental and liver functions were explored by RNAseq.

RESULTS

PPP exposure did not affect maternal biometry but disturbed maternal biochemistry (decreased glucose). Maternal exposure to PPPs did not significantly affect ultrasound data. However, multiple factor analysis (MFA) of ultrasound and Doppler measurements showed separation of the groups. A similar result was observed for MFA combining fetal biometric datasets, on which placental efficiency separated the groups. A sex-specific effect was further observed in the group separation, affecting mostly placental efficiency and relative heart weight. However, no significant differences were found using a linear mixed-effects model for individual biometric data. In addition, transcriptomic analysis identified numerous differentially expressed genes (DEGs) in the placenta and liver between groups.

CONCLUSIONS

Maternal exposure to PPPs at realistic doses had small effects on fetoplacental development, consistent with human data. According to MFAs, fetoplacental biometry as a whole was affected by PPP exposure, although individually no parameter showed a statistically significant difference., Identified DEGs at 28 dpc reflected disruption of placental and hepatic function by exposure to PPPs. Work is ongoing to determine whether this exposure affects fetal biochemistry, hepatic structure and placental morphometry. Our RESULTS already tend to show that we need to become aware of the quality of our food, which appears essential for our health and that of our children.

CONFLICTS OF INTERESTS

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EPO1_049

CO-CREATION AND DISSEMINATION OF HEALTHY EATING AND WELLBEING GUIDELINES WITH MĀORI YOUTH

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BACKGROUND AND OBJECTIVES
The conversion of evidence into culturally relevant, meaningful guidelines requires co-creation of messages with the target audience. The objective of this study was to co-create with rangatahi (young people) a set of evidence-based eating and wellbeing guidelines for young people in Aotearoa New Zealand, informed by mātauranga Māori (Māori knowledge).

METHODS
Rangatahi Māori collaborated with Māori and non-Māori experts to review multiple existing health guidelines covering healthy, sustainable eating, physical activity, screen time, sleep and mental wellbeing and developed their own set of guidelines. Four wānanga (workshops) were held at a local marae (meeting house) to 1) develop the guidelines, 2) revise them post-feedback from school peers, 3) develop dissemination materials, and 4) debrief after the 12-week social media dissemination campaign. The process integrated scientific evidence with mātauranga Māori, following tikanga Māori (Māori protocols) to ensure a culturally centred process.

RESULTS
Seventeen rangatahi Māori from four schools with high Māori student enrolment participated in the study, creating ten eating and ten wellbeing guideline messages (here). These messages were invitational (beginning 'Let's try to…') acknowledging the challenging journey for many rangatahi from current to recommended behaviours. Only one quantification (8-10 hours of sleep) was included. Three eating and three physical activity guidelines incorporated the concepts of 'mauri' (life force). The guidelines addressed contemporary issues including sustainable eating, ultra-processed foods, social dimensions of eating and physical activity, screen-time and cyberbullying. They also emphasised respect, rights and responsibilities, and concluded with a motivational whakatauki (proverb) about aspirations. 94 students provided peer-feedback through structured surveys ahead of wānanga 2. Dissemination through a social media campaign created a good audience reach of over 1.4 million accounts, and >19,000 engagement actions.

CONCLUSIONS
Innovative, relevant and contemporary eating and wellbeing guidelines have been successfully co-created by Hawke's Bay rangatahi Māori for all young people in Aotearoa New Zealand. The incorporation of mātauranga Māori was essential for creating culturally centred messages for this priority audience. The use of social media should be central to further dissemination plans.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_050

CLINICAL SIMULATION IN THE TRAINING OF FUTURE NUTRITION PROFESSIONALS: AN UNDERGRADUATE EXPERIENCE AT AN ARGENTINEAN UNIVERSITY

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BACKGROUND AND OBJECTIVES

Evidence suggests that teaching with a high theoretical content RESULTS in retention´s rate less than 20%. A student-centered teaching-learning model, such as clinical simulation (CS) can facilitate more meaningful learning and contribute to patient safety. This communication shares the experience of implementing CS throughout a Human Nutrition & Dietetics degree curriculum at a private university in Pilar, Buenos Aires, considering students' perceptions of this teaching approach.

METHODS

A descriptive analysis of the curriculum, the syllabus of the subjects that apply CS and the post-scenarios surveys of 256 students between 2022-2024 was carried out.

RESULTS

The curriculum spans 5 years, with CS progressively integrated from the first year, advancing through zones (Z) of increasing complexity, Z0 to Z2, over the first 4 years. In the 1st year, CS classes were introduced in ´Human Physiology´. Between the 2nd and 4th years, simulation-based instruction (Z1) was used to teach skills for nutritional assessment in children, adults, and athletes, employing peer-to-peer and simulated patient interactions. Technical skills in nutritional support were also developed. In the 4th year, students participate in clinical scenarios (Z2) to assess the nutritional status of simulated patients in both: hospitalized and outpatient care. Although real clinical observations occur throughout the programme, CS develops technical and soft skills to prepare students for their final-year professional internships. Student feedback on CS included: ‘Excellent experience; without this opportunity, it would be more challenging to apply these skills in real-life situations.’ ‘Very good anthropometry practice guided by the professors.’ ‘The activity provided a safe environment for professional practice, free from judgment, with constructive feedback that helped me learn.’ ‘I really enjoyed it as a way to practice and apply my knowledge while developing my interaction skills with patients.’

CONCLUSIONS

Clinical simulation is a well-established teaching-learning method in nursing and medicine but remains novel in nutrition. Acquiring skills in a CS centre enhances students' training and confidence while positively impacting patient safety in their future professional careers. Sharing experiences in CS allows for better implementation of methodology and resources allocation in our discipline.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_051

Association of the updated 2023 version of the front-of-pack nutrition label Nutri-Score with all-cause and cause-specific mortality: prospective RESULTS from the Moli-sani Study

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BACKGROUND AND OBJECTIVES
The Nutri-Score is a front-of-pack (FOP) nutrition label to inform consumers on the overall nutritional quality of foods, and is being adopted in many European countries on a voluntary basis. In 2023, the algorithm underlying the Nutri-Score was updated to better align with food-based dietary guidelines across joining countries. We tested whether the updated version of the Nutri-Score is associated with mortality in an Italian adult population.

METHODS
Longitudinal analyses were run on 22,893 participants to the Moli-sani Study (2005-2010). Food intake was assessed by a 188-item FFQ. The Food Standards Agency Nutrient Profiling System (FSAm-NPS) score, used to derive the original Nutri-Score, was calculated for each food based on its amount of energy, saturated fat, sugar, salt, fibre, protein, fruits, vegetables, legumes and nuts, according to criteria established in 2023. The FSAm-NPS dietary index (DI) was calculated for each participant as an energy-weighted mean of the FSAm-NPS score, with higher values indicating lower nutritional quality.

RESULTS
Over a median follow up of 13.1 y, 2,565 all-cause deaths occurred, of which 909 were from cardiovascular diseases (CVD) and 939 from cancer. The average value of the updated FSAm-NPS DI was 7.87 (±1.69), and highly correlated with its prior version (spearman correlation coefficient = 0.90). In multivariable-adjusted Cox regression models including known risk factors, a higher adherence to the FSAm-NPS DI was not associated with either all-cause mortality (HR= 1.06; 95%CI 0.94-1.20 for Q4 vs. Q1), nor CVD (HR=1.06; 0.86-1.32) or cancer deaths (HR=1.15; 0.94-1.4). However, the magnitude of these associations was stronger in women (all-cause mortality: HR=1.19; 0.98-1.45 and HR=0.99; 0.84-1.17 for women and men, respectively, p for interaction=0.039; cancer death: HR =1.33; 0.97-1.83 and HR=1.06; 0.81-1.39, for women and men, respectively, p for interaction=0.015).

CONCLUSIONS
The dietary index underlying the updated version of the Nutri-Score FOP nutrition label is not associated with mortality in this large population-based cohort of Italians. Although FOPs are intended to help consumers making healthier food choices, their actual impact on long-term health outcomes remains controversial.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_052

ROLES, FUNCTIONS, AND NUTRITIONAL CARE PROVIDED BY DIETITIANS IN INTENSIVE CARE UNITS: A CROSS-SECTIONAL SURVEY OF ACTIVE PRACTITIONERS IN LATIN AMERICA

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BACKGROUND AND OBJECTIVES

In 2022, it was established a dietitians' study network which includes professionals from 13 countries in order to study the roles and working environment of Clinical Dietitians, giving origin to a series of studies in this sphere. Nutritional care practices in intensive care units (ICUs) have been poorly documented in the literature, particularly in the Latin American context. This research aims to identify nutrition-related clinical practices in ICUs in Latin American countries and to examine environmental conditions that influence nutritional care provided by Dietitians in this region.

METHODS

A cross-sectional survey was administered to 223 clinical dietitians who work in ICUs from 18 Latin American countries to identify their professional activities in public and private health care facilities. The survey consisted of 30 questions related to clinical nutrition tasks. Prior to the application of the survey, a content validity process was conducted by means of the Content Validity Index (CVI). Once the experts of the participating countries had evaluated the questionnaire, the final 23-question version was available, consisting of the questions that obtained high enough scores to be considered. The average score of the questionnaire was 0.87 points. A score was calculated based on 18 activities

RESULTS

The median professional experience among dietitians was 10 years (Interquartile Range [IQR] 6-16), with a predominance of women (87%); participants primarily worked in public, high-complexity hospitals (63.2%). A majority of 61.4% reported a 40-hour work week. Regarding work areas, 70.7% worked in Adult Intensive Care Units (ICUs), 8.4% in Pediatric ICUs, and 20.9% in both Adult and Pediatric ICUs. About 3.7% did not specify the type of ICU where they provided nutritional care. Most surveyed professionals (61.4%) held a postgraduate degree in Clinical Nutrition, with Diplomas being the most common (39.5%), followed by Master's degrees (19.7%), while a smaller percentage held Doctorates (1.3%) or Specializations (0.9%).Associations were investigated with linear regression adjusted by country, sex, type of institution, complexity of the hospital, years of expertise (B: 0431IC95% 0.264-0.598), years being a dietitian and number of postgraduates (B: 0.288 IC95% 0.158-0.417). Factors positively associated with higher scores included greater years of experience and years being a dietitian. No other activities were associated

CONCLUSIONS

There is a lack of standards to regulate and examine the dietitians' workforce gap in order to improve working environment and quality of care.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_053

DIETARY SULFORAPHANE MAY MODULATE S100A8/A9 EXPRESSION AND IMMUNE HOMEOSTASIS IN ANKYLOSING SPONDYLITIS: IMPLICATIONS FOR NUTRITIONAL INTERVENTION

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BACKGROUND AND OBJECTIVES
Axial spondyloarthritis (axSpA) is a chronic inflammatory rheumatic disease primarily affecting the spine and sacroiliac joints1. It typically develops in young adulthood and is characterized by complex immune dysregulation. Nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly used as first-line treatments for pain and inflammation relief in axSpA. If NSAIDs are proven insufficient, biologic disease-modifying antirheumatic drugs (DMARDs) are often employed to control disease activity2, however they can result in serious adverse effects. There is no official universally accepted clinical nutritional recommendation protocol specifically for axSpA, however there is increasing evidence pointing towards a critical role of nutritional factors in this disease modulation. S100A8 and S100A9 are key pro-inflammatory proteins4 implicated in axSpA pathogenesis that form the calprotectin complex6. These proteins are elevated in leukocytes5 in axSpA patients and contribute to inflammation and joint damage. Previous single-cell analyses have revealed complex cell-specific alterations in S100A8/A9 expression across different immune cell subsets in axSpA, highlighting the need for targeted interventions. Sulforaphane (SFN), a compound present in broccoli sprouts with anti-inflammatory and antioxidant properties, has demonstrated efficacy in preclinical models of inflammatory diseases by modulating the Nrf2 pathway and suppressing pro-inflammatory cytokine production7,8. This study investigates the potential of dietary SFN supplementation to modulate S100A8/A9 expression and reduce inflammation in axSpA.

METHODS
Gene expression patterns were analyzed from sequenced single cells (PBMCs and CD4+ T cells) from axSpA patients and healthy controls9. Differential gene expression (DEG) analysis was performed to identify upregulated genes in axSpA. Ongoing *in vitro* studies are evaluating the effects of sulforaphane supplementation on S100A8/A9 expression.

RESULTS
DEG analysis revealed upregulation of S100A8/A9 in axSpA patients compared to controls.

CONCLUSIONS
The upregulation of S100A8/A9 suggests their role in axSpA pathogenesis. RESULTS from the ongoing *in vitro* studies will determine whether SFN can modulate S100A8/A9 expression and potentially serve as a nutritional immune intervention for axSpA. This research could contribute to developing evidence-based dietary recommendations for managing axSpA.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_054

CURRENT STATUS OF NUTRITION DEGREE TRAINING AT UNIVERSITIES IN VIETNAM

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BACKGROUND AND OBJECTIVES

The Ministry of Education and Training of the Socialist Republic of Vietnam approved the bachelor's degree program in Nutrition at Hanoi Medical University in 2013. As of now, 12 universities across the country offer training programs for nutritionists. Over the past decade, the enrollment capacity for these programs have grown significantly. However, details regarding the curriculum, its implementation across universities, and the employment outcomes of trained nutritionists remain unclear. This study aims to examine the current state of nutritionist training in Vietnam.

METHODS

Between January and December 2023, surveys were conducted across 12 nutritionist training institutions to assess curriculum content. Employment and job type surveys were also administered to 564 graduates and 323 final-year students from the class of 2023. Additionally, a survey targeting 63 provincial and city health departments under government oversight and 34 central-level hospitals under the Ministry of Health was carried out to evaluate the employment status of nutritionists and forecast demand through 2030. This study received ethical approval from the Ethics Committee of the Vietnam Nutrition Institute.

RESULTS

Graduation in nutrition at these universities requires completing 138 to 165 credits, exceeding the 120-credit standard set by the Ministry of Education and Training. Among 197 nutritionists (34.9%) and 230 final-year students (71.2%), 139 graduates (70.6%) were employed in medical facilities. Additionally, 148 final-year students (64.3%) expressed a desire to work in medical facilities. Furthermore, responses from 25 health departments (39.7%) and 18 central-level hospitals (52.9%) revealed that 94 nutritionists are currently employed in health departments and 24 in hospitals. Projections indicate a hiring demand by 2030 of 726 nutritionists for health departments and 70 for hospitals, averaging 3.8 positions per hospital.

CONCLUSIONS

This study revealed that universities in Vietnam offering nutritionist training require credit loads exceeding the standards set by the Ministry of Education. The findings also highlighted that medical facilities are the primary employment setting for nutritionists. Furthermore, the research identified a growing demand for nutritionists in health departments and public medical facilities. As the first report of its kind in Vietnam, this study is expected to contribute significantly to the advancement and standardization of nutritionist training and qualifications in the future.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_055

VALIDATING AND EVALUATING DIETARY QUALITY: ALTERNATIVE HEALTHY EATING INDEX FOR MALAYSIAN ADOLESCENTS

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BACKGROUND AND OBJECTIVES
The diet quality of adolescent is a growing concern worldwide, with significant implications for their current and future health. Assessment tools like the Alternative Healthy Eating Index (AHEI) can assesses diet quality. Evaluating diet quality with AHEI is crucial as it helps identify nutritional gaps, promotes healthier eating habits, and addresses diet-related health issues prevalent among the youth. This study aim to validate and evaluate the dietary quality of Malaysian adolescents using newly developed Alternative Healthy Eating Index for Malaysian Adolecent (AHEI-MA). This AHEI-MA was developed based on foods that can prevent chronic diseases and based from the Malaysian Dietary Guidelines for Children and Adolescents 2013.

METHODS
AHEI-MA that was developed and tailored to Malaysian adolescents' specific food and nutrient concerns was used in this study to asses adolescents dietary quality. Data from the Malaysian Health and Adolescents Longitudinal Research Study (MyHeART study) was used to validate this eating index. 424 adolescents aged 15 years old from urban and rural schools in Malaysia provided information on sociodemography data, anthropometry data and dietary intake. Their dietary intake were collected using 7 days dietary history. Their diet quality then were calculated based from the 7 days dietary history using the AHEI-MA.

RESULTS
The AHEI-MA scores were categorized as good diet quality (>80%), diet requiring improvement (51–80%), and poor diet quality (>51%). The findings indicated that urban adolescents exhibited a mean diet quality score of 52.35%, categorized as "needs improvement," whereas rural adolescents demonstrated a poorer mean score of 48.55%. Additionally, female adolescents achieved significantly higher diet quality scores compared to their male counterparts with score of 62.79% compared to 27.03%. Meanwhile, range of score of sugar component intake shows that urban score slightly better than rural (6 vs 4), while both urban and rural adolescents score 0 for sodium component.

CONCLUSIONS
The use of the AHEI-MA for adolescents is crucial in promoting healthier dietary habits and addressing nutritional deficiencies. This study highlights the importance of evaluating diet quality among Malaysian adolescents. However, larger validation studies are needed to further confirm the reliability and applicability of the AHEI-MA in diverse adolescent populations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_057

HOW ALIGNED ARE THE CHILEAN FOOD-BASED DIETARY GUIDELINES WITH CANCER PREVENTION? A CONTENT ANALYSIS

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BACKGROUND AND OBJECTIVES

Cancer is a multifactorial disease involving a range of genetic, medical, environmental, and health-related behaviors. In 2022, Chile experienced an estimated 59,876 new cancer cases and 31,440 cancer-related deaths. Evidence suggests that 30% to 50% of cancer incidence is linked to unhealthy behaviors. It is therefore important that dietary recommendations, including population-based dietary guidelines, and public policies be designed to support and facilitate healthier choices. We evaluated the alignment between the updated Chilean Food-Based Dietary Guidelines (FBDG) and cancer prevention recommendations from the World Cancer Research Fund (WCRF/AICR) and the Latin America and the Caribbean Code Against Cancer (LAC-Code).

METHODS

A content analysis was performed based on the disclosure and technical documents from the updated Chilean FBDG (2023). A matrix of eight categories were developed to evaluate the relevance of the messages with cancer prevention recommendations: i) scientific evidence-based; ii) local context; iii) population focused; iv) public policy endorsement; v) clear communication; vi) dietary pattern approach; vii) realistic and achievable, & viii) prevention of other diseases. Furthermore, we compared the 10 Chilean FBDG messages with the WCRF/AICR and the LAC Code recommendations.

RESULTS

The updated Chilean FBDG messages met most of the categories included. Four out of ten of the Chilean FBDG messages were directly aligned with LAC Code and the WCRF/AICR recommendations, five had an indirect relationship, and one was not related to any cancer recommendation.

CONCLUSIONS

This study suggests that the updated Chilean FBDG messages are most often indirectly aligned with the worldwide and the Latin American region cancer prevention recommendations over the role of diet, nutrition and physical activity in cancer risk among the general population. Our RESULTS may guide future updates to incorporate direct cancer prevention rationales and messages, considering the high incidence and prevalence of cancer in Chile.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_060

DEVELOPING A NATIONAL ALLIANCE FOR A 'TRUSTED' VOICE TO ENSURE NUTRITION SCIENCE IN GOVERNMENT POLICY MAKING FOR FOOD AND NUTRITION

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BACKGROUND AND OBJECTIVES
A national decadal plan for nutrition science was developed in 2019. This plan identified key research pillars to advance nutrition and highlighted critical enabling infrastructures to support delivery of the plan. Among these was the need for a 'trusted' voice in nutrition science to diminish the cacophony advocating non-evidence-based advice to politicians and community. The objective here is to describe the development of this 'trusted voice'.

METHODS
The conceptualisation of the 'trusted' voice collective as a valued partner by government for food and nutrition policy, involved two phases. Firstly, the model was explored at a one-day symposium. An experienced researcher led discussion with early career researchers to develop a logic model to establish the 'trusted' voice. Secondly, a small steering committee of six Academy of Science National Nutrition Committee researchers, policy experts, and exofficio members was formed to lead the implementation.

RESULTS
The one-day symposium members suggested four key objectives for the 'trusted' voice now known as a national Alliance for Nutrition Science. These included development of a vision, mission and terms of governance, bringing together diverse interested organisations, prioritising and developing the policy recommendations, and advocacy for evidence-based policy. Of critical importance was the ability of an Alliance to amplify voices and this would require both financial commitment, and intellectual input. The steering committee established the proposed vision, mission, scope, and governance via terms of reference. Additionally, it became important to define principles about what constituted highest quality scientific nutrition evidence. Potential member organisations were identified, provided with a brief document outlining the rationale and principles for the Alliance, and invited to a briefing presentation and discussion. Twenty-three organisations attended and expressed willingness to join the Alliance.

CONCLUSIONS
It is possible to bring together diverse professional societies and non-government organisations to amplify messages to government and ensure that the highest level of evidence available in nutrition science underpins the development of food and nutrition policy. This case study shows the importance of a decadal plan with an implementation model to enable the uptake of nutrition science evidence for the public good.

CONFLICTS OF INTERESTS
Magriet Raxworthy Executive position with Danone until May 2023

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EPO1_061

EXAMINING NUTRITION POVERTY AND ITS ASSOCIATION WITH DIETARY DIVERSITY AMONG INDIAN CHILDREN: POLICY RECOMMENDATIONS FROM A LARGE-SCALE HOUSEHOLD SURVEY

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BACKGROUND AND OBJECTIVES
Chronic malnutrition remains a significant barrier to improving child health outcomes. Addressing this issue requires a multidimensional approach that considers factors beyond income, such as dietary diversity, access to healthcare, and living conditions. In this lieu, this paper aims to (1) develop a Multidimensional Nutrition Poverty Index (MNPI) for under-five children, (2) identify the extent of child nutrition poverty, and (3) examine the linkage between nutrition poverty and diet diversity.

METHODS
The MNPI was developed using the Alkire-Foster dual cut-off approach for household data from the fifth round of the NFHS (2019-20). For the present study, eight indicators were selected under four dimensions, viz., (1) stress: malnutrition and under-five mortality, (2) access: education and living standards, (3) availability: diet diversity and antenatal care, and (4) adequacy: immunization and nutrition knowledge. These indicators were assigned different weights and tested for robustness using Spearman's rank correlation and Kendall's tests. In addition, a regression tree and biplot were used to depict the linkage between nutrition poverty and diet diversity.

RESULTS
MNPI estimation indicated that the headcount ratio (H) and intensity (A), respectively, was 0.605 and 0.48, leading to 29.2% of the children experiencing nutrition poverty. Of the eight indicators chosen for their relevance to child health, it was found that diet diversity (21.68%) was the most contributing factor, followed by living standards (21.17%) and child malnutrition (19.64%). Among the regions, the MNPI was higher in the case of eastern India, like Nagaland (0.5058), Bihar (0.4772), Jharkhand (0.4065), and Assam (0.4017). A comparison between rural and urban India showed that the MNPI was higher in rural regions (31.74%). The regression tree analysis done to identify the correlates of MNPI affirmed that diet diversity largely influenced nutrition poverty, i.e., MNPI. Regional prioritization using biplot analysis indicated a strong linkage between nutrition poverty and regional diet diversity.

CONCLUSIONS
This study offers valuable insights into critical factors that could facilitate efforts to reduce nutrition poverty and identify high-priority areas for policy intervention to record improved health outcomes in the long run.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_062

ADHERENCE TO THE MEDITERRANEAN DIET IS ASSOCIATED WITH REDUCED ABDOMINAL OBESITY IN TAIWANESE RENAL TRANSPLANT RECIPIENTS

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BACKGROUND AND OBJECTIVES
This study investigated the association between adherence to the Mediterranean diet (MD) and abdominal obesity among renal transplant recipients (RTRs) in a single-center hospital. It was hypothesized that MD positively impacts waist circumference (WC) in RTRs.

METHODS
This cross-sectional study included 252 RTRs. Demographic and laboratory data were retrieved from medical records. WC was measured at the midpoint between the lowest rib and the iliac crest using a horizontally positioned tape measure. Abdominal obesity was defined as WC ≥ 90 and ≥ 80 cm in men and women, respectively based on Taiwan Ministry of Health and Welfare. Three-day dietary records were collected by trained dietitian. Adherence to MD was evaluated using Literature-Based Adherence Score (LBAS) with scores ranging from 0 to 18 (minimum to maximum adherence).

RESULTS
A total of 252 patients (54.76% men; mean age 49.40 ± 12.57 years) participated. Mean WC and LBAS were 83.92 ± 11.09 cm and 8.48 ± 2.35, respectively. The prevalence of abdominal obesity was 46.43% (n = 117). After adjusting for covariates such as age, sex, energy intake, comorbidities, body mass index, transplant date, donor source, immunosuppressant use, and insulin resistance, a 1-point increase in LBAS was associated with a 21.2% reduction in the likelihood of abdominal obesity (odds ratio: 0.798, 95% CI: 0.635–1.004, p = 0.054).

CONCLUSIONS
High adherence to MD pattern is associated with a lower prevalence of abdominal obesity in RTRs. Mediterranean-style diet may be an effective strategy in Taiwanese RTRs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_063

CO-DESIGN OF ANTENATAL MULTIPLE MICRONUTRIENT SUPPLEMENT (MMS) PACKAGING TO SUPPORT OPTIMAL ADHERENCE AND ACCEPTANCE IN CAMBODIA

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BACKGROUND AND OBJECTIVES
Recognizing the mounting evidence for the effectiveness of multiple micronutrient supplements (MMS) on preventing adverse birth outcomes, the Ministry of Health in Cambodia supports the transition from iron-folic acid to MMS. Previous research has shown that women deem specific colors, logos, and slogans attractive and appropriate for pregnancy. Evidence indicates adequate packaging and brand trust significantly influence adherence to supplementation. This study aims to implement a co-design process to gather insights from Cambodian pregnant women and their partners regarding MMS packaging, focusing on design elements such as color, product name, slogans, logos, and messaging.

METHODS
A convenience sample of 15 pregnant women and their partners were selected to attend a 2-hour participatory workshop in four different provinces in Cambodia. Three preliminary MMS packaging designs were developed based on prior qualitative findings. During the workshops, participants provided quantitative ratings using a Likert scale and qualitative feedback on the different packaging options: color, product name, slogan, logo, and key messages. Qualitative data was analyzed using thematic content analysis, while quantitative data was summarized using descriptive statistics

RESULTS
A total of 4 workshops were held with 84 participants in Kampong Chhnang (n=25), Ratanakiri (n=25), Takeo (n=15), Kampot (n=19). Pink emerged as a favorite color with participants (n=40/84) associating it with beauty and happiness. The product name "Multivitamin" resonated strongly with participants (n=64/84), who valued the idea of receiving multiple nutrients in a single supplement. The slogan "Good friend for pregnant women" was popular among participants (n=44/84), as it conveyed a sense of support for an optimal pregnancy experience. Visual preferences were clear, with Image A receiving high ratings (n=54/84). This image depicted a beautiful woman enveloped by multiple vitamin "bubbles". Participants found the message “supports baby to be strong and smart” to be the easiest to understand (n=26/84) and the most motivational (n=24/84). The simplicity of the message and significance of supporting their baby made it participants top choice

CONCLUSIONS
This co-design process ensures that MMS packaging is visually engaging, culturally relevant, and easily comprehensible. Findings from these workshops will be disseminated with the MoH in Cambodia to ensure pregnant woman and their family members preferences are considered for the final design of the MMS packaging in Cambodia.

CONFLICTS OF INTERESTS
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EPO1_064

REVAMPED EFSA DRV FINDER: AN INTERACTIVE WEB TOOL FOR DIETARY REFERENCE VALUES

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BACKGROUND AND OBJECTIVES

Dietary reference values (DRVs) is an umbrella term for a set of nutrient reference values that define the nutrient requirements in the general population and inform about the potential risks of excess intakes. DRVs underpin nutrition recommendations, aiding health professionals in dietary assessment and planning, policymakers in setting dietary guidelines, and food manufacturers in product formulation. The European Food Safety Authority (EFSA) is responsible for establishing DRVs for the European population. EFSA has set DRVs for fats, carbohydrates and dietary fibre, protein, energy, water, vitamins, and essential minerals.

METHODS

The DRV Finder is a freely available interactive web tool that provides quick access to EFSA's DRVs and allows users to explore the different values by population group or nutrient. The tool, available in 11 European languages, was first launched in 2018 and has recently been updated to include the most recently established values.

RESULTS

Several DRVs for nutrients are established to address the requirement for a nutrient which varies across individuals. When sufficient data is available, Average Requirement (AR) and Population Reference Intake (PRI) values are set, covering the needs of half and most (97.5%) of the population, respectively. When AR and PRI cannot be determined, adequate intake (AI) and reference intake ranges for macronutrients (RI) are used. AI is the intake level assumed to be sufficient based on observations from groups of apparently healthy people, while RIs are set for energy sources like fats and carbohydrates. DRVs are tailored by age and sex, and when necessary, by other characteristics, to reflect population diversity.
The Tolerable Upper Intake Level (UL) is the highest level of daily intake of a nutrient which is not expected to pose a risk of adverse health effects to humans when consumed chronically. When data are insufficient to characterise the relationship between the nutrient intake and the adverse effect and derive a UL, a safe level of intake is established. Although both values aim to protect against the risks of excessive nutrient intake, the applications of a safe level of intake for risk management purposes are more limited.

CONCLUSIONS

The updated DRV Finder now includes all DRVs established by EFSA, including the latest UL values for selected vitamins and essential minerals, as well as for added and free sugars. The tool also gives access to the respective EFSA opinions, which provide the scientific basis for each value. It is designed to be continuously updated as new DRV opinions are published.

CONFLICTS OF INTERESTS

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EPO1_065

QUANTITY AND FREQUENCY OF AVOCADO CONSUMPTION FOR HEALTH BENEFITS IN FREE LIVING ADULTS: A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES
Avocados are a nutrient dense food and have a unique nutritional profile where regular consumption may favour a number of health benefits. In particular, regular avocado consumption appears to offer protection against cardiovascular disease (CVD) risk, mainly through reductions in blood lipids. Moreover, regular avocado consumption may also improve body composition by promoting reductions in central adiposity. However, there is a lack of evidence-based recommendations on the amount (and frequency) of avocado needed to elicit the proposed health benefits. Therefore, we systematically scoped the existing literature to identify the optimal quantity and frequency of avocado needed to elicit health benefits without adverse health effects in free living adults.

METHODS
A systematic search of the literature was conducted across multiple databases, including MEDLINE (PubMed), SCOPUS, CINAHL Ultimate (EBSCO), ProQuest, Web of Science, and Clinical Trial Registries in July 2024. All types of study designs were included if they reported on the quantity and / or frequency of avocado consumption against any health-related outcome. The protocol for this scoping review was prospectively designed and registered with Open Science Framework with the RESULTS reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.

RESULTS
A total of 54 articles were included. Cardiovascular health (n = 25) was the most commonly reported health outcome followed by metabolic health (n = 8) and weight management (n = 8). In clinical trials, lipid lowering benefits were demonstrated with an intake of one avocado per day (ranging from 136-168 grams). Consumption of 0.5-1 avocado per day (70-140 grams per day) was not associated with weight gain. When combined with an energy restricted diet, one avocado per day (136-175g) may help facilitate reductions in central adiposity.

CONCLUSIONS
Current evidence suggests that one avocado per day (ranging from 136-168 grams) has favourable effects on lowering blood lipids in individuals with and without CVD risk factors. However, there is a lack of primary studies to articulate evidence-based recommendations for avocado consumption on benefits related to secondary CVD risk factors, glycaemic control, vascular functioning, cognition, digestive health, cancer risk, reproductive, skin and musculoskeletal health.

CONFLICTS OF INTERESTS
This scoping review was funded by Hort Innovation Australia Limited and the Australian Avocado Growers

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EPO1_068

MANAGING CHILDREN 6-59 MONTHS WITH MODERATE ACUTE MALNUTRITION USING A LOCALLY-PRODUCED SUPPLEMENTARY FOOD THROUGH THE TOM BROWN PROGRAM IN NORTHEAST NIGERIA

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BACKGROUND AND OBJECTIVES
Northeast (NE) Nigeria has been negatively affected by a protracted conflict, which has led to food insecurity and contributed to a high prevalence of global acute malnutrition. In part due to ongoing supply chain issues and resulting stock-outs of commercially-manufactured nutrition supplements, NE Nigeria has experienced critical gaps in treatment coverage for acute malnutrition. In response, Save the Children began implementing the Tom Brown targeted supplementary feeding program (TSFP) in Borno and Yobe states to treat children 6-59 months with moderate acute malnutrition (MAM). The Tom Brown TSFP uses locally-sourced ingredients to create a porridge known as Tom Brown, in combination with community-based support groups. This study aims to add to the evidence base around Tom Brown, including around nutrition outcomes, cost-efficiency, and community-based perceptions and experiences.

METHODS
Multiple methods were used: 1) a quantitative analysis of nutrition outcomes; 2) a cost-efficiency analysis using an ingredients-based costing approach to compare in-kind delivery of Tom Brown commodities vs use of cash and voucher assistance (CVA) for group facilitators to procure commodities; 3) an analysis of post-distribution monitoring survey data (n=204 enrolled mothers); 4) key informant interviews of group facilitators (n=10) and 5) focus group discussions with enrolled mothers (n=20) and male heads of household (n=20).

RESULTS
A 10-week enrolment cycle in the Tom Brown TSFP was found to have notably improved nutrition outcomes compared to an 8-week enrolment, including: a 13% higher recovery rate (94% vs 83%) and 52% lower deterioration from MAM to SAM (2.4% vs 5%). The CVA modality was found to be half as costly as the in-kind delivery modality, with a cost-transfer-ratio of $0.87 (CVA) vs $1.75 (in-kind). Group facilitators reported appreciating the increased autonomy with the CVA modality, though expressed that it required an increase in time commitment. Enrolled mothers and male heads of household reported high levels of satisfaction and acceptance with the Tom Brown TSFP with no unintended consequences.

CONCLUSIONS
This study shows high recovery and low deterioration rates among children with MAM enrolled in the Tom Brown TSFP, and the program has high community acceptance. A 10-week enrolment and a CVA modality are recommended for future Tom Brown programming. The Tom Brown model offers a sustainable approach to treating MAM, particularly in contexts where stock-outs of commercially-manufactured nutrition supplements are common.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_071

THE TRADITIONAL SUBSISTENCE AGRICULTURE OF THE AO NAGA TRIBE: A SOURCE OF FOOD SECURITY AND SOVEREIGNTY

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BACKGROUND AND OBJECTIVES
The Ao Naga, an indigenous tribe in Nagaland, has long relied on swidden cultivation, or jhum farming, as the mainstay of their subsistence agriculture. Mokokchung district, with its lush hilly terrain, is an ideal environment for this traditional practice. Here, jhum farming is part of a rich tapestry of diverse, rotational, and primarily indigenous forms of agriculture. Farmers undertake this "shifting cultivation" sustainably and ecologically. Jhum fields are incredibly biodiverse, typically hosting upwards of 30 crops in staggered maturation. These practices ensure a steady supply of food security that is beautifully diverse in both kind and quantity. Moreover, for the Ao Naga, this ecological agriculture underscores food sovereignty unfettered by market dependency. Much of this knowledge is passed down orally from one generation to the next, making it "vulnerable" in the modern world.

METHODS
The study used stratified simple random sampling to choose 21 Ao villages from the Mokokchung district. With the help of the Nagaland government, which facilitated logistics and ensured participation, the researchers held focus group discussions (FGDs) in these 21 villages. Each FGD lasted 60–75 minutes. The researcher secured consent from all participants, who were free to decline, to ensure the conversation was legitimate. The researcher of this study inscribed the findings both by hand and electronically.

RESULTS
During the research, many previously undocumented techniques used in jhum also came to light. These techniques help ensure food and nutritional security for the Ao Nagas. However, the study also found evidence of a worrisome trend: Jhum cultivation is in decline. Communities all over the Ao Naga area are gradually giving up jhum and switching to monocropping practices for economic gains. Those practices result from national food and nutrition policies prioritising energy production over dietary diversity and nutrition.

CONCLUSIONS
This research reveals how important jhum farming is in maintaining Ao Naga food security and sovereignty. It is more than a tool of agriculture; it is also a significant cultural component of the tribe. They should be saved immediately for the good of Ao Naga and serve as a template for sustainable agriculture worldwide. This Indigenous wisdom needs to be retained if we are to support resilient food systems

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_075

EVALUATING AFFORDABILITY OF HEALTHIER DIETS IN FOUR AFRICAN COUNTRIES

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BACKGROUND AND OBJECTIVES

Around 800 million people around the world were affected by hunger in 2021. The prevalence of undernourishment continues to affect the world, and particularly Sub-Saharan Africa (1). Exacerbated inequalities across and within countries are undermining the nutritional adequacy and affordability of diets and threatening vulnerable groups including children under five years of age and women of childbearing age. This research within the InnofFoodAfrica (2) presents a diet optimization approach where the objective is to identify the nutritional gaps with observed diets and propose food recommendations to reach the nutritional adequacy and affordability of diets across four African countries, namely Ethiopia, Kenya, South Africa and Uganda.

METHODS

We developed diet optimization models to assess nutritional and economic to assess nutritional and economic dimensions of sustainability for children and mothers in two cities per African country leading to 16 theoretical solutions of optimal diets. The data used to calibrate the model and assess the nutritional quality of observed diet came from surveys of food consumption by women of childbearing age and their children aged 6 to 24 months. To assess budget constraints, a food price dataset was built from data provided by the World Bank International Comparison Program.

RESULTS

For all the geographical cases, our RESULTS suggest the need to diversify diets and adjust portion sizes of the main food groups. For women and children, nutritional adequacies of vitamins A and C can be achieved by increasing vegetable and fruit consumption. A reduction in cereals and an increase in pulses are suggested as part of a balanced diet. For children, increasing meat and poultry consumption provides better adequacies of iron and zinc. In terms of affordability, the solutions propose diets for which total expenditures do not exceed our estimates of the current observed budget. Our RESULTS indicate that Uganda is the country that allocates the least resources to food, while South Africa has the least affordable diet. In all cases, affordability does not necessarily imply an unattainable situation for improving the nutritional adequacy of diets.

CONCLUSIONS

Achieving healthier diets in African urban areas requires a multifaceted approach that addresses both demand and supply. By implementing targeted policies to promote healthier consumption choices, there is a need to stimulate the production, accessibility and affordability of nutritionally-sensitive food environment.

CONFLICTS OF INTERESTS

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EPO1_077

THE COPLANT STUDY - FUTURE RESEARCH ON PLANT-BASED NUTRITION

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BACKGROUND AND OBJECTIVES
Despite the growing interest in plant-based diets and the increasing debate about their risks and benefits, recent studies investigating the associated health status or long-term health effects are scarce. The few available cohort studies were often published years ago, have a limited scope, and are not representative of today's plant-based diets, particularly regarding the consumption of vegan foods, meat substitutes, or dairy alternatives.

METHODS
The planned prospective cohort COPLANT "COhort on PLANT-based diets" began baseline recruitment between April and June 2024 in 6 study centers in Germany. In January 2025, an additional study center in Vienna, Austria, will begin recruitment. A total of about 6,000 participants aged 18-69 years, who have been consistently following a vegan, vegetarian, pescatarian, or omnivorous diet for at least one year based on self-reported adherence, are expected to take part over 3 years. Recruitment aims to balance participants across sex, age, and diet strata.
The NutriDiary app and a detailed food frequency questionnaire encompassing plant-based food items will be used to assess usual dietary intake. Furthermore, body composition, bone health, and nutritional behavior (e.g., meal preparation habits) are assessed. Biological samples (blood, urine, and faeces) will be analyzed to evaluate nutritional status, metabolic markers, relevant contaminants and residues, and gut microbiota composition.

RESULTS
By the end of November 2024, more than 700 participants (12% of the planned sample size) had been recruited. Recruitment data indicate that women are generally easier to recruit than men, and it has been particularly challenging to recruit pescatarians. To address this, target recruitment strategies are being explored, such as outreach via specialized communities. Preliminary data checks indicate good data quality.

CONCLUSIONS
The COPLANT study aims to compare the health benefits and potential short-term and long-term risks of different diets, such as nutrient deficiencies, metabolic imbalances, or sustainability trade-offs. Future RESULTS are expected to improve our understanding of diet-related risk factors and provide a robust evidence base for public health guidelines. These findings should serve as a critical decision-making aid for individuals, healthcare professionals, policymakers, and sustainability advocates.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_081

A STUDY ON ANALYZING AND ADDRESSING GAPS IN ANEMIA CONTROL PROGRAM: AN ATTEMPT TO COMPLEMENT COMMUNITY HEALTH WORKERS PARTICIPATION

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BACKGROUND AND OBJECTIVES
Despite advancements in health and technology, anemia remains a critical public health issue in India, especially among women. Government efforts, including the Anemia Mukt Bharat (AMB) program, face challenges such as inadequate IFA tablet supply, poor service coverage, and weak coordination from policy to field level. Accountability and transparency through information-sharing systems (G2G: Government to Government and G2B: Government to Business) remain underexplored. This study evaluates implementation gaps in the AMB program's 6x6x6 strategy and explores opportunities for increased government participation.

METHODS
The study used quantitative methods, including Knowledge, Attitudes, and Practices (KAP) surveys of 100 school-going adolescents (15–18 years) and 30 frontline workers (FLWs: 18 ASHAs, 12 AWWs). Qualitative approaches involved focus group discussions (FGDs) with pregnant women, lactating mothers, and their mothers-in-law. A Village Health and Nutrition Day (VHND) checklist and a structured questionnaire were administered to ten Ministry of Health and Family Welfare officers using Google Forms.

RESULTS
89% of adolescent girls showed poor knowledge about anemia. Although attitudes towards consuming green leafy vegetables were positive, adherence to IFA tablets was low (61%), and WASH practices were inadequate. FLWs performed better in the knowledge component, with 94.4% of ASHAs scoring in the average category, compared to the adolescent girls. Focus group discussions highlighted poor adherence to IFA tablets among women, driven by dislike of the taste and forgetfulness due to household work. Additionally, many lactating mothers and women of reproductive age reported an insufficient supply of IFA tablets. The VHND checklist confirmed a lack of tablets and educational materials for anemia awareness. Anemia prevalence among pregnant women in the block was 42.5% (FY 2022–2023). Officers acknowledged the potential of G2G and G2B systems for better accountability but noted persistent grassroots challenges, including weak multi-sectoral coordination.

CONCLUSIONS
The study highlights gaps in community and healthcare workers' focus on anemia with persistent grassroots challenges and suggests strengthening G2G and G2B data-sharing systems to enhance leadership, accountability, and collaboration in addressing health disparities.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_082

EATING WINDOW AND BODY COMPOSITION IN SCHOOL-CHILDREN: PRELIMINARY ANALYSIS FROM THE EDDY STUDY

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BACKGROUND AND OBJECTIVES
Apart from the amount and content of food, meal timing intake has been linked to metabolic health. Eating window, among other meal timing variables (number of meals/day, pre-bed fasting time, first and last meal hours, frequency of breakfast), has been extensively studied in adults. However, information on children is still understudied (1,2), We aimed to describe characteristics of meal timing and body composition according to eating duration in a sample of schoolchildren from the EDDY study in Vienna.

METHODS
The EDDY (Effects of sports and diet training to prevent obesity and secondary diseases and to influence young children's lifestyle) was implemented in one intervention school (n=48). Another school acted as control (n=38). Questionnaires assessed meal timing data. The eating window was calculated based on the hours between each child's first and last meal and divided into terciles according to the variable distribution by study group. The number of meals corresponded to an average reported daily intake of meals and snacks. Baseline BMI z-score and body composition variables were compared between children who showed the longest (3rd tertile) vs the shorter (1st tertile) eating window by study group. Changes in anthropometric variables after a 2-year intervention were compared according to terciles of eating window in each study group. The analyses were adjusted for sex and age.

RESULTS
The median age was 8.1 (7.3-9.3) years. Frequency of children with overweight/obesity was 9/48 and 15/38 in the intervention and control group (p=0.003). No baseline differences by group were observed between meal timing variables (p≥0.14). Median eating window in the intervention group was 11:35 (95%CI: 9:30-13:00) hours and 12:00 (95 % CI: 9:00-14:30) hours in the control group (p=0.14). Compared to the control group, where no differences were observed, in the intervention group, children with a longer eating duration [(3rd tercile; ≥12 hours); median 12:33 hours)] had lower BMI z-score, waist-to-height ratio and body fat index (p<0.014) than those with a shorter eating duration [(1st tercile; <11 hours); median 10:21 hours)]. Moreover, the median breakfast frequency was higher (7 vs 3 days, p=0.001). After the intervention, no differences in body fat, BMI z-score, or waist-to-height ratio changes between terciles of eating window were observed.

CONCLUSIONS
Our RESULTS showed a large variation in eating window times in a sample of elementary schoolchildren, ranging from 9:00 to 14:30 hours.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_083

IMPROVING MONITORING OF VITAMIN A SUPPLEMENTATION: A COMPARISON OF ADMINISTRATIVE AND SURVEY DATA ACROSS SUB-SAHARAN AFRICA

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BACKGROUND AND OBJECTIVES

Administrative records and household surveys are commonly used to monitor and guide Vitamin A supplementation (VAS) campaigns in Sub-Saharan Africa, providing insights into coverage levels and areas requiring intervention.

METHODS

This study compared Vitamin A supplementation (VAS) coverage data from 2023, using administrative sources and post-event coverage surveys conducted in the first half of 2023 in Burkina Faso, Côte d'Ivoire, the Democratic Republic of Congo (DRC), and Kenya, and in the second half of the year in Mali and Nigeria. This quantitative study employs a two-stage cluster sampling method, stratified by urban and rural areas, with probability proportional to size for household selection. The aim is to assess the coverage of Vitamin A supplementation for children aged 6 to 59 months across different countries.

RESULTS

In all six countries, administrative data reported higher VAS coverage than PECS estimates. In Mali, administrative data indicated 144% coverage, compared to 88.9% from PECS. Similarly, Burkina Faso reported 102.41% administrative coverage versus 82.1% in PECS, while Côte d'Ivoire reported 99.9% administrative coverage compared to 77.5% in PECS. In the DRC, coverage gaps ranged from 7.3% to 26.1%. In Nigeria, PECS survey data showed lower VAS coverage than administrative records, with 46.6% in Bauchi, 72.7% in Kebbi, and 76.6% in Sokoto, compared to 76%, 95%, and 94% respectively. In Kenya, PECS survey data also showed lower VAS coverage compared to administrative records, with variances of 18.4% in Meru, 10.8% in Tharaka Nithi, 8.4% in Nyandarua, and 12.4% in Kirinyaga.

CONCLUSIONS

The study reveals significant discrepancies in VAS coverage between administrative and PECS data. Further research should focus on refining monitoring systems to bridge these gaps and ensure accurate, actionable data.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_084

OPTIMIZING VITAMIN A SUPPLEMENTATION: TAILORING COMMUNICATION STRATEGIES TO URBAN-RURAL AND SOCIO-ECONOMIC CONTEXTS

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BACKGROUND AND OBJECTIVES

Vitamin A supplementation (VAS) campaigns are vital for combating vitamin A deficiency in developing countries. While communication strategies are just one aspect of campaign preparation, they are pivotal in mobilizing and sensitizing populations about VAS. Urban populations generally have greater access to media and healthcare access where they become aware of the campaign schedule and the benefits of VAS. In contrast, rural populations often rely on informal communication channels, with cultural beliefs influencing the dissemination and reception of health information

METHODS

Data were collected from cross-sectional Vitamin A supplementation coverage surveys conducted in Mali and Guinea among caregivers of children aged 6-59 months, as part of post-event coverage surveys for Vitamin A supplementation during the second semester of 2023 and the first semester of 2024. Descriptive analyses and logistic regression were used to examine coverage for each intervention as well as coverage for the full package of interventions. The sample included 14,765 children aged 6-59 months and 8,951 caregivers. The analysis focused on exploring the correlation between information sources, caregivers' understanding of the benefits of Vitamin A supplementation, their attitudes towards supplementation, and the resulting VAS coverage among children.

RESULTS

The RESULTS reveal several significant associations with Vitamin A supplementation in both Mali and Guinea. Key information sources, including public announcers (OR = 2.973, CI: 2.5–3.5), health workers (OR = 3.055, CI: 2.6–3.5), health facility workers (OR = 3.797, CI: 3.2–4.4), and opinion leaders (OR = 3.813, CI: 3.2–4.4), are strongly associated with increased odds of receiving supplementation, with odds ratios well above 1 and confidence intervals consistently indicating positive values. Additionally, other sources such as radio (OR = 2.684, CI: 2.1–3.2) and television (OR = 1.531, CI: 1.2–2.0) also play important roles in improving supplementation coverage. Wealth has a slight but significant negative effect on supplementation, with wealthier individuals being less likely to receive supplementation (OR = 0.941, CI: 0.9–1.0)

CONCLUSIONS

Context-specific communication strategies leveraging community-based actors are crucial for optimizing Vitamin A supplementation (VAS) campaigns, as shown by higher uptake associated with local information sources and significant contextual differences between Mali and Guinea, but no disparity between rural and urban areas.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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discuss the effectiveness of large-scale Vitamin A supplementation campaigns, particularly in rural areas, in improving childhood nutrition and reducing deficiencies that can impact growth and immune function. Ozawa et al. (2017) provide a global overview of the impact of Vitamin A supplementation on public health, underlining its cost-effectiveness in preventing childhood blindness and mortality, especially in low-income countries. Sarr et al. (2019) focus on the implementation challenges and successes of Vitamin A supplementation programs in West Africa, and recommend continued investment in public health infrastructure to ensure high coverage rates.

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EPO1_085

BUILDING INVESTMENT CASE(S) IN MICRONUTRIENT DATA AND EVIDENCE

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BACKGROUND AND OBJECTIVES
Policymakers and other stakeholders require evidence to identify micronutrient deficiencies and their root causes, and to design and manage impactful, cost-effective, and sustainable intervention programs. Different types of evidence can be generated with some more expensive than others, and stakeholders may have preferences on the types of evidence. Guidance on developing context-specific investment case(s) for generating and delivering evidence is needed in low- and middle-income countries (LMICs).

METHODS
Based on the nutrition data value chain conceptual framework, six research activities were undertaken. First, we developed an analytical framework for evidence investment cases. Second, we conducted interviews with selected in-country stakeholders and experts to capture the nuances of micronutrient evidence needs. Third, we designed and implemented empirical costing exercises for an example country, focusing on three key data sources: nutritional biomarker surveys, 24-hour dietary recall surveys, and household consumption and expenditure surveys. Fourth, we used the existing literature to identify the benefits and programmatic costs of alternative large-scale food fortification programs, as seen through the lenses of different types of evidence. Fifth, we set the 'marginal benefits' of different types of evidence alongside the costs of generating and delivering them. Finally, these inputs were used to create a general framework for investment cases for micronutrient evidence.

RESULTS
We found that investment cases for micronutrient evidence must encompass data collection, evidence generation, and evidence delivery, each carrying different associated costs. Evidence generation and delivery must align with policy processes for maximum impact as the enabling environment *conditions* the benefits of evidence. Micronutrient policy discussions can begin with incomplete evidence and from experiences of other countries, but country-specific evidence is needed to sustain the enabling environment and to manage intervention programs.

CONCLUSIONS
Policymakers must prioritize diverse evidence needs; partnerships are vital for LMICs to effectively navigate the challenges of evidence generation. By fostering an enabling environment, leveraging existing data, and investing in new data, we can advocate for improved micronutrient intervention programs, leading to improved nutritional outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_088

CHALLENGES AND ADAPTIVE SOLUTIONS FOR MAINTAINING NUTRITION SERVICES DURING COVID-19: A QUALITATIVE STUDY

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BACKGROUND AND OBJECTIVES
The rapid spread of COVID-19 forced governments to urgently implement non pharmaceutical measures to stop the surge. These restrictions disrupted provision of services. This study identified challenges and adaptive solutions.

METHODS
A multiple cases qualitative study was carried out. Purposive sampling was used for recruitment of participants (57). The interview guide incorporated nutrition leadership, financing, workforce, infrastructure and commodities, service delivery and information system. For each topic, subtopics were on challenges and adaptations. All transcripts were exported to Atlas Ti V22 and thematic analysis was conducted.

RESULTS
Challenges included the exclusion of nutrition services as a core pillar in the COVID-19 response, the reduction in the number of nutrition service providers, and insufficient funding to sustain activities promoting services continuity. Global supply chain disruptions resulted in shortages of Ready-to-Use Therapeutic Food, while poor data monitoring hindered effective decision-making. Advocacy efforts were made to include nutrition services as a key pillar. Timetables with staff rotation systems were introduced. Community Health Workers were trained to conduct activities independently. In addition, expanding the number of sites for vaccination to minimize patient contact. Facilities develop and utilize locally produced therapeutic foods.

CONCLUSIONS
COVID-19 had a negative impact on nutrition services by affecting the 6 components of the health system. Described adaptation strategies are needed to be drawn upon during periods of calm and be included in a plan for maintaining continuity of nutrition services in times of crisis.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_089

MULTILEVEL FACTORS ON THE CONSUMPTION BEHAVIOR OF SUGAR-SWEETENED BEVERAGES AMONG PRIMARY AND SECONDARY SCHOOL STUDENTS: A QUALITATIVE STUDY BASED ON TEACHERS' PERSPECTIVES

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BACKGROUND AND OBJECTIVES

The consumption of sugary beverages and the prevalence of obesity among primary and secondary school students in China have increased significantly. This study investigates the factors influencing sugary beverage consumption among primary and secondary school students from the perspective of teachers, aiming to provide actionable insights for public health systems to design effective school-based health education interventions.

METHODS

This qualitative study was conducted from September to November 2024 in eight primary and secondary schools in Beijing. A total of 56 teachers participated in face-to-face interviews, including both individual interviews and focus group discussions. Data were analyzed using the grounded theory approach with three levels of coding.

RESULTS

The analysis yielded 39 subcategories, 15 categories, and five main categories: individual, interpersonal, environmental, societal, and policy levels. The six most frequently mentioned categories were teachers' knowledge and attitudes (128 references), school health education (96 references), drivers of sugary beverage consumption (56 references), students' individual awareness (53 references), the school food environment (40 references), and home-school collaboration (39 references). A core theme was identified: the multilevel factors of students' sugary beverage consumption based on teachers' perspectives.

CONCLUSIONS

This study identifies a range of multilevel factors spanning individual, interpersonal, environmental, societal, and policy dimensions, which influence sugary beverage consumption among students. Teachers' knowledge and attitudes, school health education, the school food environment, students' individual cognition, consumption drivers, and home-school collaboration were the most commonly mentioned factors. School-based health education interventions and efforts to enhance home-school collaboration are crucial for reducing sugary beverage consumption among primary and secondary school students.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_090

EFFECTS OF HIGH-PROTEIN DIET INTAKE ON APPENDICULAR SKELETAL MUSCLE MASS IN COMMUNITY-DWELLING OLDER ADULTS: A PRE-POST COMPARISON STUDY

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BACKGROUND AND OBJECTIVES
Background: Sarcopenia in older adults significantly impacts quality of life and health span. High-protein diets may help maintain and increase skeletal muscle mass. This study examined the effects of incorporating high-protein powder food into daily meals on appendicular skeletal muscle mass index (ASMI) in community-dwelling older adults.
Objective: To investigate the effects of 3 months of high-protein food intake on appendicular ASMI.

METHODS
Methods: This single-arm pre-post study included 56 community-dwelling adults aged ≥65 years. Participants consumed 18 g/day of protein from a high-protein food (4.5 g protein/5 g; Enjoy Protein, Morinaga Milk Industry Co., Ltd.) in 1–4 servings, with intake timing at their discretion. Assessments were at baseline, 1.5 months, and 3 months. Variables included ASMI (InBody S10), height, weight, and dietary intake (brief self-administered questionnaire at baseline and 3 months). Repeated-measures ANOVA and Bonferroni tests were used. This study was approved by the Ethics Committee of the Tokyo Metropolitan Institute for Geriatrics and Gerontology（R23-100）.

RESULTS
RESULTS: Excluding 4 dropouts and 5 with adherence <80%, 47 participants were analyzed (mean age: 71.6 ± 4.2 years; 70.2% female). ASMI increased significantly (baseline: 6.4 ± 1.0 kg/m2; 1.5 months: 6.5 ± 1.0 kg/m2; 3 months: 6.5 ± 1.0 kg/m2 ; $p < 0.05$). Values at 1.5 and 3 months were significantly higher than baseline, with no difference between 1.5 and 3 months. No significant changes were observed in protein intake from diet (excluding test food) or in body weight.

CONCLUSIONS
Conclusion: Three months of high-protein food intake effectively maintained and increased ASMI in community-dwelling older adults. Simple dietary interventions may aid muscle preservation in this population. Future studies with control groups are warranted.

CONFLICTS OF INTERESTS
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EPO1_093

IMPROVING MEASUREMENT OF MATERNAL MICRONUTRIENT SUPPLEMENT COVERAGE

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BACKGROUND AND OBJECTIVES
To improve birth outcomes and maternal/child health, micronutrient interventions are recommended, including iron and folic acid (IFA), multiple micronutrient supplements (MMS), and calcium. Accurate sub-national data on supplementation coverage during pregnancy is critical, but national survey questions may lack validity. We conducted formative research and cognitive testing to inform the design of new survey questions and visual aids for better comprehension by women.

METHODS
In Bangladesh and Ethiopia, we mapped available supplements across facilities and markets (n=47). We used qualitative methods to gather data from pregnant and recently pregnant women using free listing (n=26), pile sorting (n=14), and key informant interviews (KIIs) (n=40). Findings informed the design of survey questions and visual aids, which were refined through cognitive testing (n=32). Free listing salience was calculated using FLARES, and pile sorting data were analyzed using multidimensional scaling.

RESULTS
We identified three themes: 1) Distinguishing between different types of supplements, 2) Consumption and adherence, and 3) Tailoring questions for currently pregnant women. Over 40 types of micronutrient supplements are available in Ethiopia and more than 60 in Bangladesh. There are distinctions between government-distributed supplements and those from non-governmental clinics, pharmacies, and other retailers. Visual aids helped women differentiate between supplements. Packaging (e.g., blister packs vs. bottles) plays a role in distinguishing products and estimating adherence. Women found it easier to respond to questions about supplement consumption in terms of a 'typical week' or 'typical month.' The third theme highlighted the need to adapt questions for pregnant women to ensure clarity and relevance.

CONCLUSIONS
The revised questions aim to reduce respondents' cognitive burden and improve the accuracy of maternal micronutrient coverage measurements in national surveys, supporting evidence-based decision-making. These improved methods will be shared with global survey programs and with over 20 countries exploring or introducing multiple micronutrient supplements (MMS). The questions will help countries track progress, including who is receiving iron-containing supplements (IFA or MMS), where they access them, and whether supplementation begins in the first trimester, as recommended by WHO.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_094

DEFINING THE DAIRY MATRIX AND ITS HEALTH EFFECTS

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BACKGROUND AND OBJECTIVES
The health effects of foods extend beyond individual nutrients. For instance, while regular fat dairy contains saturated fats that raise LDL-cholesterol, epidemiological studies often show no link—or even a protective one—between dairy intake and CVD risk. This discrepancy may be explained by the dairy matrix, a concept lacking a precise, globally recognized definition. Establishing a harmonized definition would enhance clarity, consistency, and communication in nutrition science.

METHODS
Seventeen scientists in the area of nutrition and health from thirteen countries participated in discussions, coordinated by the International Dairy Federation, for the establishment of definitions of dairy matrix and dairy matrix health effects. The discussions were based on literature reviews on dairy matrix and food matrix where relevant definitions and snippets of the terms where reviewed.

RESULTS
The harmonised definitions set by the expert panel are: *Dairy matrix* describes the unique structure of a dairy food, its components (e.g., nutrients and non-nutrients) and how they interact; *dairy matrix health effects* refer to the impact of a dairy food on health that extend beyond its individual components. The definitions aimed to balance the complexity of the concepts and their practical application. Similar definitions could be applied for the food matrix and food matrix health effects.

CONCLUSIONS
The harmonised international definitions could help nutrition science by uncovering mechanisms that explain health effects of foods beyond their individual nutrients. They would also highlight the practical implications of the food and dairy matrix on nutrition and health outcomes, supporting the development of evidence-based policies to improve public health. Integrating food and dairy matrix concepts into dietary guidelines, policies, and labelling practices promises a new era of evidence-based, holistic nutrition.

CONFLICTS OF INTERESTS
All authors are member of the action team on Dairy Matrix of the International Dairy Federation.

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EPO1_095

THE IMPACT OF POST-HARVEST HANDLING ON THE BIOCHEMICAL COMPOSITION OF SELECTED INDIGENOUS GHANAIAN FOOD CROPS

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BACKGROUND AND OBJECTIVES
In developing countries, inadequate postharvest handling practices contribute significantly to food insecurity and economic losses.While extensive research has focused on quantifying postharvest losses, limited attention has been given to the impact of these practices on the biochemical composition of food crops. Understanding these impacts is critical for devising interventions to preserve nutritional quality and crop value. This study investigates the influence of postharvest handling practices on the biochemical composition of three indigenous Ghanaian crops in the Techiman and Kintampo municipalities.

METHODS
A combination of surveys and supply chain tracing was employed to map handling practices from farms to distribution points and markets. Crop samples were systematically collected at key stages of the supply chain, including harvesting, transportation, and sale.The collected samples are being analyzed for variations in mineral content, fatty acid profiles, proximate composition, and metabolite levels.

RESULTS
Preliminary RESULTS indicate significant changes in nutrient composition due to poor handling practices, underscoring the need for targeted interventions to reduce quality deterioration.

CONCLUSIONS
This research highlights the critical link between postharvest handling and food quality, providing actionable insights for policymakers and stakeholders to enhance food security and economic sustainability in Ghana and similar contexts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_096

A HIGHLY SIGNIFICANT PUBLICATION BIAS BETWEEN AUTHORS THAT ARE OR ARE NOT AFFILIATED WITH THE FRONT-OF-PACK LOGO NUTRI-SCORE

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BACKGROUND AND OBJECTIVES
Nutri-Score has gained significant attention as a front-of-pack labeling (FOPL) system. However, concerns remain about the adequacy of scientific evidence supporting it. Peters and Verhagen (2022) critically evaluated the Nutri-Score system using the European Food Safety Authority (EFSA) framework for health claim substantiation. They emphasized the need for real-life validation studies and independent scientific evaluations. The current evaluation highlights the broader issue of publication bias, particularly in studies affiliated with the developers of Nutri-Score, warranting further investigation into the relationship between author affiliation and study outcomes.

METHODS
We have evaluated the association between author affiliations and reported outcomes related to Nutri-Score (Peters and Verhagen, 2024). The study reviewed published literature to classify outcomes as favorable or not favorable, with authors categorized as affiliated or not affiliated with the developers of Nutri-Score. Following this, a critical reaction by Touvier et al. (2024) was published as a rebuttal to the findings of Peters and Verhagen. The rebuttal, while not a separate study, provided an alternative perspective on the same dataset and further reinforced the observed patterns of potential publication bias. The original study and the rebuttal were analyzed collectively to assess consistency and significance in the reported findings. A Chi-Square test was used to statistically evaluate differences in outcome distributions between the two groups.

RESULTS
It was found that 93% of studies authored by affiliated researchers were favourable, compared to only 39% of those authored by non-affiliated researchers ($X2 = 32$, $p < 0.001$). Similarly, Touvier et al. found that affiliated authors exclusively reported favorable outcomes (100%), whereas non-affiliated authors showed a more balanced distribution, with 45% favorable and 55% unfavorable outcomes ($X2 = 33$, $p < 0.001$). Both analyses consistently demonstrate a strong association between author affiliation and reported study outcomes.

CONCLUSIONS
The findings highlight significant publication bias in Nutri-Score-related research, with affiliated authors overwhelmingly favouring the system, while non-affiliated authors present more varied RESULTS. This bias underscores the need for rigorous, independent studies to objectively evaluate Nutri-Score's public health impact. Ensuring unbiased scientific evaluation is essential for accurately determining the system's validity and guiding policy decisions on front-of-pack labeling.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_097

LEVERAGING ARTIFICIAL INTELLIGENCE FOR QUALITATIVE NUTRITIONAL ANALYSIS: A SCIENTIFIC PERSPECTIVE

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BACKGROUND AND OBJECTIVES
Advances in artificial intelligence (AI) have opened new possibilities for personalized nutritional guidance, addressing challenges like scalability and accessibility in dietary counseling. This study investigates the application of GPT-4-based AI for qualitative nutritional analysis of food images, aligning with the Brazilian Dietary Guidelines. The system integrates computer vision to identify foods and portions and natural language processing (NLP) via GPT-4 to generate tailored nutritional feedback, promoting healthier dietary habits. Objective: To assess the effectiveness of an AI-driven system for qualitative nutritional analysis compared to manual assessments by nutritionists, focusing on accuracy, scalability, and response time.

METHODS
Data from 427 users of the automated system were analyzed, involving 3,404 interactions across 1,833 sessions. The system's performance was evaluated in terms of response time, quality of recommendations, and user engagement. To benchmark, 1,189 manual analyses conducted by nutritionists on a digital platform were assessed. The comparison included analysis precision, feedback quality, and user satisfaction. Feedback was further analyzed to identify patterns of errors and areas for system improvement.

RESULTS
Between February and September 2024, the AI system completed 1,833 nutritional analyses, compared to 430 manual assessments by nutritionists. The AI provided instantaneous responses, while the average response time for nutritionists was 11 minutes and 46 seconds. User satisfaction with the AI was 60%, although 24% reported inaccuracies in the analyses. On the digital platform, manual assessments achieved an average rating of 4.81/5, with no significant correlation between response time and user ratings

CONCLUSIONS
The AI system demonstrated remarkable scalability and significantly faster response times than manual consultations, with the ability to provide personalized feedback. However, it showed limitations in accuracy and food classification. These findings suggest that a hybrid approach, integrating the speed of AI with the expertise of human nutritionists, could achieve superior RESULTS in qualitative nutritional analysis, offering a promising pathway for scalable and precise dietary counseling.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_098

EFFECTS OF BETA-GLUCAN ON WEIGHT IMPROVEMENT AND DYSLIPIDEMIA IN HIGH-FAT DIET-INDUCED OBESITY

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BACKGROUND AND OBJECTIVES
Obesity is a growing public health problem. Dietary fiber consumption is widely recognized for its role in preventing obesity and overweight. The objective of this study is to evaluate the effect of introducing β-glucan (BG) on body weight management, blood lipid parameters, and histological architecture of the liver and adipose tissue in Wistar rats fed a high-fat diet (HFD).

METHODS
Twenty-four male rats weighing approximately (142 ± 5) g, were included in this study and submitted to different experimental diets for 12 weeks. An extraction and dosage of β-glucan were performed beforehand. The rats were then divided into four groups: a control group receiving a standard diet (C), a group receiving a standard diet supplemented with 5% β-glucan (CBG), a group submitted to a (HFD), and a group submitted to (HFD) enriched with 5% β-glucan (HFDBG). Monitoring of anthropometric parameters was carried out throughout the experiment. The dosage of lipid parameters and the study of the tissue architecture of the liver as well as of the adipose tissue were carried out after the sacrifice of the animals.

RESULTS
The (HFD) induced an increase in food intake, reflected by a significant gain in weight and BMI. On the other hand, the consumption of (BG) limited weight gain. We also noted that the (HFD) induced dyslipidemia reflected by a significant increase in total cholesterol, triglycerides, and LDL-C and a significant decrease in HDL-C. The introduction of (BG) significantly reduced the levels of dyslipidemia. Histological sections of epididymal adipose tissue from groups of rats show a very significant increase in adipocyte diameter in the group subjected to the (HFD). However, the comparison between the group (HFD) and that treated with beta-glucan (HFDBG) reveals a notable decrease in adipocyte diameter. Furthermore, histological sections of the liver of rats subjected to the (HFD) revealed histopathological alterations, characterized by a disorganization of the typical hepatic structure. On the other hand, the administration of (BG) allowed to restore the hepatocellular architecture.

CONCLUSIONS
This study demonstrated that the introduction of (BG) into the diet significantly attenuated the deleterious effects of obesity. These RESULTS highlight the interest of dietary fiber supplementation, particularly β-glucan, in prevention and treatment strategies for obesity related to a high-fat diet.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_099

B-CASEIN MILK A2/A2, REDUCED ABDOMINAL PAIN IN MILK INTOLERANT INDIVIDUALS ABSTRACT

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BACKGROUND AND OBJECTIVES
Historically, cow's milk has been a staple food in the human diet; however, its consumption may impact lactose digestion and contribute to bacterial overgrowth in the small intestine among individuals with low gastrointestinal tolerance (GIT). The objective of this study is to determine gastrointestinal tolerance, stool consistency, and lactose digestion associated with the consumption of two types of milk: A2 β-casein milk and commercial milk containing both A1 and A2 β-casein, in subjects who self-report milk intolerance.

METHODS
This randomized, double-blind, crossover study investigated the effects of inyake of 100% β-casein A2 milk (A2/A2) versus a commercially available milk containing both A1 and A2 β-caseins (A1/A2) on gastrointestinal tolerance (GIT), stool consistency, lactose digestion, and hydrogen breath excretion in 44 self-identified milk intolerant adults. Participants consumed in a crossover design 300ml of each milk type with a 7-day of a washout period. GIT was evaluated during 4-h postprandial using a symptoms questionnaire, stool consistency with the Bristol Stool Scale, and lactose digestion via hydrogen breath test.

RESULTS
A significant reduction in the mean score of abdominal pain milk was observed at four hours post-consumption of A2/A2 ($p=0.017$) and overall measuring times ($p= 0.013$). A significant association was found between GIT and hydrogen breath values ($p<0.0001$), and between dairy product consumption and GIT ($p<0.0001$). No significant differences in stool consistency were observed between treatments. Nor there were significant differences in hydrogen breath test RESULTS between treatments.

CONCLUSIONS
TA2/A2 milk demonstrated superior tolerance specifically regarding abdominal pain reductioncompared with A1/A2 milk in self-reported milk-intolerant individuals. No differences were found in stool consistency or lactose digestion as assessed by hydrogen breath tests. The study suggests that the type of β-casein may influence GIT in milk-intolerant individuals, but the impact on lactose digestion remains inconclusive.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_100

STRENGTHENING LOCAL ECOSYSTEM VIA RESILIENT COMMUNITY HUBS FOR COMPREHENSIVE DEVELOPMENT OF CHILDREN AND WOMEN

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BACKGROUND AND OBJECTIVES

Community-based interventions are critical for addressing multi-dimensional challenges of malnutrition,education and healthcare.Indian Government through its Integrated Child Development Services program has played a crucial role in ensuring that beneficiaries receive comprehensive care and education[1].With a focus on transforming angawanwadi centres into smart learning centres having high-quality infrastructure, there is still a need for concerted efforts to achieve the target for holistic development[2]. Nand Ghar (NG) initiative focuses on transforming these community hubs with the overall objective of establishing sustainable ecosystem that leverages a multi-sectoral approach, community engagement, private sector engagement, integrating nutrition, education, and healthcare services.

METHODS

Piloted in underserved areas with targeted interventions, we used mixed-methods approach to assess impact across 16 states.Quantitative and quantitative methodologies namely structured key-informant interviews, human centered design, secondary data and case studies were conducted with key stakeholders.Digital tools were deployed for real-time monitoring for data-driven decision-making. [3]

RESULTS

7000 structures built using Building as Learning Aid (BALA),provision of water purifiers, child-friendly furniture increased community engagement with 80% increase in attendance.Distribution of millet bars improved median weight impacting 48,000 children in three blocks in Varanasi and access to supplementary nutrition improved benefitting 2.8 lakh children.Imunization camps, provision of Iron Folic Acid supplements to pregnant and lactating women ensured access to primary healthcare,clean water,100% vaccination for children. e-learning through smart TVs,trained frontline workers in Early Childhood Care and Education (ECCE),caregiver awareness achieved 100% school readiness. Women empowerment initiatives increased household incomes by USD 115,market linkages created with government schemes,0.1m trained,0.19m women impacted.Sustainability efforts ensured 100% electricity access through solar panels or grid connections,established over 5000 kitchen gardens, promoted tree plantations, and facilitated the handover of 5000 NG to community [4].

CONCLUSIONS

Scaling Nand Ghars nationwide through multi-sectoral coordination and partnerships will ensure improved health, nutrition, education outcomes, empower women and foster community ownership and contribute to achieving the Sustaniable Development Goals.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_104

A PANORAMA OF MAGNESIUM: EXPLORING DIETARY REFERENCE INTAKE STANDARDS, A NARRATIVE REVIEW

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BACKGROUND AND OBJECTIVES

Magnesium is the second most common ion at the intracellular level (IC). Its abundance reflects its important role in the organism (1-6). Various factors may influence Magnesium bioavailability and ingestion. Western dietary habits result in insufficient Magnesium intake and a link between low Magnesium levels and chronic diseases is now well established. Dietary Reference Intake (DRI) are of vital importance in determining the optimal nutrient intake in healthy population. Magnesium DRIs are determined by old balance studies, and outdated anthropometric data. In an intend to update Magnesium DRIs many theoretical and mathematical models have been developed, but discrepancies persist (7-10).

METHODS

To identify the latest recommendations for Magnesium, an internet search was conducted using PubMed and Science Direct, with the Scielo database consulted for data specific to Latin America. No date restrictions were applied, and the following search terms were employed: “Dietary Magnesium,” “Magnesium Recommendations,” “Magnesium Requirements,” “Magnesium Intake,” and “Dietary Reference Intake of Magnesium.”

RESULTS

This narrative review evaluates Magnesium as an essential cation and examines the factors that contribute to its bioavailability, the recent methods used for the determination of Magnesium, and its DRI from a global perspective, aiming for an updated understanding.

CONCLUSIONS

There is a critical need to revise and update Magnesium requirements across populations, as Magnesium plays an essential role in modulating chronic diseases.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_105

ENHANCING DIETETIC EDUCATION THROUGH AI VIRTUAL PATIENT TRAINING

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BACKGROUND AND OBJECTIVES
In recent years, the application of Artificial Intelligence (AI) in the medical field has grown rapidly, establishing itself as a valuable tool for healthcare training. Research indicates that AI-based communication education modules can significantly enhance medical students' communication abilities. However, despite the importance of communication skills in dietitian training, there remains a notable lack of AI-driven educational resources tailored to nutrition training. This study aimed to assess the impact of AI virtual patient interactions on clinical consultation training among dietetic students.

METHODS
A randomized controlled trial was conducted with 27 dietetic students, who were randomly assigned to one of two groups: the self-learning group (n = 14), serving as the control group and using traditional self-practice methods, and the AI group (n = 13), which practiced with AI-powered virtual patients. Participants in both groups were evaluated on their clinical consultation and communication skills using the Objective Structured Clinical Examination (OSCE). Additionally, their nutritional assessment knowledge was assessed through a written test before and after the intervention.

RESULTS
A total of 27 dietetic students from both groups completed the OSCE and the nutritional assessment knowledge test. Compared to baseline scores, neither the self-learning group nor the AI group showed significant improvements in nutritional assessment knowledge. However, the AI group (mean = 19.1 ± 5.2) achieved significantly higher OSCE communication skill scores ($p = 0.002$) compared to the self-learning group (mean = 13.1 ± 5.2).

CONCLUSIONS
Our study indicates that AI virtual patient training has a positive impact on the nutritional counseling performance of nutrition students who have not yet begun hospital internships. However, it does not demonstrate a significant effect on professional knowledge acquisition. Further research is needed to explore the potential application of AI in dietetic education.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_106

SALT REMOVAL EFFECTS AND BEHAVIORAL CHANGES IN LOCAL INDIGENOUS FOOD TO PREVENT HYPERTENSION: A RANDOMIZED TRIAL ～AGRICULTURE FOR HEALTH AND WELL-BEING～

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BACKGROUND AND OBJECTIVES
Hypertension affects more than 1.28 billion people worldwide. Approximately one-third of the Japanese population has hypertension. Recently, the consumption of vegetables rich in potassium, which promotes sodium excretion, has attracted attention as an effective preventive measure against hypertension.
This study aimed to cultivate, process, and analyze local foods with potential sodium excretion benefits and to evaluate their impact on salt excretion and dietary behavior through a dietary intervention study.

METHODS
A randomized crossover-controlled trial was conducted with 60 adults. Participants were assessed for lifestyle and urinary sodium-to-potassium (Na/K) ratios and allocated to groups with equivalent ratios. A four-week dietary intervention (Jerusalem Artichoke Tea 133mL) and eight-week washout period followed. The effects were analyzed using paired t-tests and mixed-effects models, with stratification by the Na/K ratio.
An RCT was also conducted using edamame, dadachamame as a food source, stratified by Na/K ratio greater than or equal to 4.0 and less than 4.0. Local indigenous food (dadachamame), containing 1700 mg/100 g potassium, was cultivated in collaboration with local farmers. This potassium level is approximately three times higher than that found in common edamame. The study was approved by the Ethical Review Committee of Yamagata University School of Medicine.

RESULTS
The overall effect of salt removal was not significantly different. However, in the high-risk hypertensive group with an Na/K ratio of 5.0 or higher, the effect of salt removal was 5.59 in the intervention group and 6.64 in the control group (p=0.02), showing a significantly higher salt removal effect. Similar RESULTS were also confirmed in the stratified RCT. Participants in the indifferent phase improved significantly from 50.0% to 33.3% after the intervention and 23.8% after the Na/K ratio measurement.

CONCLUSIONS
Dietary intervention significantly affected salt excretion in the high-risk hypertensive group and induced desirable dietary behavioral changes. This practice is expected to revitalize agriculture and improve the health of residents.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_108

DEVELOPMENT AND VALIDATION OF A PHOTOGRAPHIC FOOD ATLAS FOR PORTION SIZE ESTIMATION AMONG SRI LANKAN ADOLESCENTS

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BACKGROUND AND OBJECTIVES
There is limited dietary intake data of adolescents in low and middle-income countries partly due to the low accuracy in portion size estimation using conventional dietary assessment methods. To address this, a food atlas - a collection of photographs showing various portion sizes of selected food items can serve as a useful tool. This study aimed to develop and validate a photographic food atlas featuring portion sizes of commonly consumed food in Sri Lanka, specifically designed for adolescents.

METHODS
From 15 different food groups, 240 food items that are commonly consumed by Sri Lankan adolescents were prioritized based on data from previous studies. Among these prioritized food items, some were prepared using a standard recipe book, while others were purchased from the local market. These items were photographed using a smartphone with a 13-megapixel camera. Photographs were taken from 90-degree angles to capture the aerial views and 45-degree angles to represent the perspective of a person sitting at a table and looking at a plate in front of him. White crockery with a blue background was used to present the food items. Subsequently, the developed food atlas was used to collect dietary data from selected participants (n-30) for two non-consecutive days employing weighed food records and multi-24-hour dietary recall method, with the food atlas serving as a portion size estimation aid. The validity of the atlas was assessed using percentage error, Cohen's weighted kappa (κw), and Bland-Altman limits of agreement.

RESULTS
A total of 240 food items, each with four portion sizes (small, medium, large, and extra-large), commonly consumed by Sri Lankan adolescents were depicted in the atlas. There were no significant differences reported between weighed food portions and recalled portion size image selection for most food items.

CONCLUSIONS
The Food Atlas will be a valuable tool for accurate dietary assessment and surveys among adolescents in Sri Lanka. The color photographic food atlas developed in this study appears to be a useful and valid tool for estimating portion sizes of the most commonly consumed dishes in Sri Lanka.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_110

THE FIRST EVIDENCE-BASED DIETARY GUIDELINES AND TOOLS DEVELOPED FOR MYANMAR TO IMPROVE DIET AND NUTRITION FOR PREGNANT AND LACTATING WOMEN AND CHILDREN AGED 2 TO 5 YEARS

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BACKGROUND AND OBJECTIVES
Myanmar's food-based dietary guidelines (FBDGs) have evolved significantly since their inception in 2003 and the subsequent revision in 2007, which provided general dietary guidance without specific recommendations on food quantities, agriculture, food sustainability. The latest guidelines, published in 2023, developed using a globally recognized methodology, represent a transformative step in addressing the unique nutritional needs of pregnant and lactating women (PLW) and children aged 2 to 5 years. These guidelines aim to foster evidence-based dietary practices, facilitate policy implementation, improve nutritional outcomes and prevent all forms of malnutrition in Myanmar.

METHODS
The FBDG development process involved establishing a multi-sectoral working group, conducting an evidence review, and tailoring age-specific guidelines, followed by publication, implementation, and monitoring and evaluation. Analyses of dietary patterns, cultural and socioeconomic factors, and food systems in Myanmar were informed by national surveys, reports, and academic literature. Multi-stakeholder consultation meetings were held to engage policymakers, and sectoral experts. Practical tools, such as diet modeling, food exchange lists, The Myanmar Food Atlas, menu plans, and Information, Education, and Communication (IEC) materials, were developed to ensure nutrient adequacy, dietary diversity, and practicality. Pilot studies were conducted to validate the IEC materials' clarity, feasibility, contextual relevance, and acceptability among communities and stakeholders.

RESULTS
The updated FBDGs provide evidence-based, age-specific recommendations that incorporate considerations for sustainability, accessibility, and affordability of foods in Myanmar. They address persistent nutritional challenges, including inadequate dietary diversity, and significant rates of stunting, anemia, and micronutrient deficiencies in PLW and children. Pilot studies demonstrated improved comprehension of dietary recommendations and highlighted their potential to promote better nutritional practices.

CONCLUSIONS
The development of evidence-based FBDGs marks a significant milestone in public health nutrition, shifting from general recommendations to a comprehensive framework grounded in scientific evidence to promote healthy dietary practices in the country. Sustained commitment through stakeholder collaboration, interdisciplinary efforts, and periodic updates will ensure their long-term impact and adaptability to evolving nutritional needs in Myanmar. (Travel support from the Center for Human Nutrition, Johns Hopkins University, US)

CONFLICTS OF INTERESTS
The authors declare involvement in the FAO Dietary Guidelines Project in Myanmar. This abstract represents the authors' independent views and does not reflect FAO policies or positions.

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EPO1_111

DIETARY CARBOHYDRATE PATTERNS DERIVED BY CLUSTER ANALYSIS ARE ASSOCIATED WITH ADHERENCE TO THE EATWELL GUIDE RECOMMENDATIONS AMONG UK ADULTS

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BACKGROUND AND OBJECTIVES
The Eatwell Guide (EWG) recommends that a third of the diet should come from starchy carbohydrates. Both quality and quantity of carbohydrates are important in achieving a healthy diet, with studies highlighting a stronger link between carbohydrate type and disease risk than total intake. This study explores dietary carbohydrate patterns among UK adults, adherence to EWG recommendations, and associations with sociodemographic factors.

METHODS
Statistical clustering was used to classify the population according to consumption of starchy-based meals (i.e., potatoes, bread, rice, pasta, and other cereals) using the data from a 4-day food diary of 2,757 adults (19-85 years old) in the National Diet and Nutrition Survey (year 2016-2019). The obtained dietary carbohydrate patterns were assessed for adherence to nine EWG food and nutrient recommendations (fruits and vegetables, oily fish, other fish, red and processed meat, fibre, salt, free sugars, saturated fats, and total fat) by age and sex. Multivariable logistic regression was employed to examine the associations between sociodemographic factors and dietary carbohydrate patterns.

RESULTS
Four distinct dietary carbohydrate patterns were identified: "Balanced Carbohydrate Sources" (48%), "White Bread and Fried Potatoes" (24%), "Pasta, Rice, and Other Cereals" (19%), and "Whole Grains" (9%). The "White Bread and Fried Potatoes" pattern had the highest proportion (37%) of individuals with very low adherence to EWG recommendations (0-2 guidelines met), while the "Balanced Carbohydrate Sources" pattern showed the highest compliance, with 55% meeting 3–4 dietary guidelines. Overall, commonly unmet recommendations included fruits and vegetables (27%), oily fish (20%), and dietary fibre (8%), with mean intakes of 311.2g, 9.1g, and 19.5g, respectively, falling below recommendations. The "White Bread and Fried Potatoes" pattern was also associated with the highest mean intake of less healthy dietary components, such as red and processed meat (71.0g), salt (5.6g), free sugars (54.5g), saturated fat (27.2g), and total fat (74.4g). Significant associations ($p < 0.01$) were observed between dietary carbohydrate patterns and sociodemographic factors, including sex, age, income, and household size.

CONCLUSIONS
Understanding starchy carbohydrate dietary patterns, which are often central to food security for certain demographics, can offer valuable insights for designing interventions that contribute to meeting both food and nutrient recommendations and the cultural preferences of diverse population groups.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_114

TARGETED METABOLOMICS IN THE NEPTOX STUDY: EXPLORING EARLY-LIFE METABOLIC PROFILING

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BACKGROUND AND OBJECTIVES

Targeted metabolomics is a powerful tool for investigating specific metabolites and metabolic pathways linked to key physiological processes. In the NEPTOX study, we employ targeted metabolomics to examine maternal and infant blood, with the aim of better understanding how early-life exposures, such as nutrition and environmental pollutants, affect metabolic pathways that influence fetal and infant growth, neurodevelopment, and long-term health outcomes. This approach also seeks to identify biomarkers or metabolic pathways that may predict developmental trajectories and health risks, supporting the development of interventions that promote optimal health during critical periods.

METHODS

Targeted metabolic profiling will assess nutritional and functional biomarkers, including B-vitamins, fat-soluble vitamins, and essential amino acids. Central to investigating the effects of nutritional and environmental exposures on growth and development, we will also measure a wide array of complementary biomarkers and metabolites. These include those linked to inflammation and immune activation, energy homeostasis, and cardiometabolic health. The approach will target individual metabolites and biomarkers, whole metabolite classes, and defined metabolic pathways such as C-reactive protein, calprotectin, neopterin, the kynurenines, one-carbon metabolism, and the TCA cycle. Gut-derived metabolites, including short-chain fatty acids, indoles, and choline derivatives, will also be measured to explore microbiome-related metabolic activity and effects. These analyses will employ GC-MS/MS, LC-MS/MS, MALDI-TOF-MS and microbiological methodologies at Bevital, Bergen, Norway.

RESULTS

The targeted metabolic profiling approach enables precise quantification of metabolites associated with nutrient utilization, metabolic shifts, and exposure-related metabolic changes during pregnancy and early life. It will provide insights into molecular mechanisms and enhance understanding of how early exposures effect growth, neurodevelopment, and health outcomes.

CONCLUSIONS

This targeted metabolomics approach supports a deeper understanding of early-life metabolic processes, offering critical insights into the interplay between nutrition, microbiome function, and environmental exposures. These findings will guide interventions and policy recommendations aimed at protecting maternal and infant health, particularly in low-resource settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_115

DEVELOPMENT OF THE DUTCH ULTRA-PROCESSED FOOD INDEX: A NEW TOOL TO ESTIMATE DIETARY QUALITY BASED ON INDUSTRIAL PROCESSING LEVELS

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BACKGROUND AND OBJECTIVES
Observational studies have consistently shown that high intake of ultra-processed foods (UPFs) is associated with increased risks of obesity and non-communicable diseases, including type 2 diabetes, cardiovascular disease, and cancer. Most studies apply industrial processing classifications, such as the Nova system to classify foods as UPF. An often overlooked methodological issue is that dietary data used in observational studies is not designed to quantify UPF consumption. Ultra-processed foods form a highly heterogeneous food category and categorizing foods solely based on the degree of processing not taking into consideration nutritional differences. While most of the healthy eating indices are developed based on dietary guidelines focusing on conventional food groups, the contribution of UPFs to diet quality has rarely been considered.

METHODS
We developed a novel Dutch UPF index (DUPFI) that categorizes food intake considering both food processing levels and diet quality. The DUPFI consists of eight categories representing the four Nova classes split into health-beneficial and health-risk. First, all items of the Dutch Food Composition Database (NEVO) were classified according to the Nova Classification system. Composite dishes were disaggregated into ingredients. Each ingredient was assigned the proportionate contribution to the dish based on its weight and all dishes were classified accordingly.

RESULTS
All NEVO items were classified as health-beneficial (a) or health-risk (b) within their Nova class based on available literature and the Dutch Dietary Guidelines. Most dietary assessment methods in the Netherlands rely on the NEVO table, allowing our UPF index to be applied to all dietary assessment methods, to accurately estimate total food and energy intake of healthy and health-risk UPF and non-UPFs across cohort dietary data.

CONCLUSIONS
Future research can apply the index to investigate associations between UPF consumption and health outcomes in Dutch adults, differentiating between health-beneficial and health-risk foods. The Dutch UPF index contributes to providing a clearer understanding of the role food processing plays in public health nutrition.

CONFLICTS OF INTERESTS
Dr. Marlou Lasschuijt has received a reimbursement for presenting at conference by Nestle Prof. Ciarán Forde has engaged in paid and non-paid consultancy for a wide range of food companies that manufacture processed foods. He has provided online presentations on ultraprocessed foods to the staff of AB Mauri, Wrld Sugar reserach Organiation, General Mills, Pepsico and Mondelez.

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EPO1_116

DISPUTES OVER THE AGENDA TO PROMOTE ADEQUATE AND HEALTHY EATING - HOW THE BIG SODA INTERFERED IN THE BRAZILIAN TAX REFORM

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BACKGROUND AND OBJECTIVES

A large and growing body of evidence demonstrates that sweetened beverages (SB) taxes reduce purchases/consumption of these products. The measure was reinforced as part of a multi-policy package needed to reduce rates of overweight/obesity and other diet-related diseases, and was implemented in several countries, with positive health impacts (WHO, 2023; 2024). Brazil approved an SB tax in December 2024, one of the RESULTS of the Tax Reform (TR) process. Despite this, taxation is one of the most feared measures by the commercial entities (CE), who use strategies to delay and avoid it through corporate political activity (CPA), as in the Brazilian process. Thus, our objective is to map the CPA of the CE throughout TR in 2024.

METHODS

We gathered data on activities of the mapped CE related to SB taxation between March and December 2024 (when National Congress and Ministry of Economy deliberations occurred), mainly from Google Alerts®, but also from social media, official websites and sponsored press media articles. The terms registered were: “ABIR” (Brazilian Association of Sodas and Non-Alcoholic Beverage Industries); “sin tax”; “excise tax”; “Tax Reform beverage”; “Tax Reform soda”. Documents of Executive Level meetings with CE representatives were obtained through the Freedom of Information request Law. Data analysis was based on the Ulucanlar et al. (2023) taxonomy of CPA strategies, by classifying it as action or framing strategy. We examined: (i) action date; (ii) action description; (iii) strategy used; and (iv) CE arguments.

RESULTS

We identified 47 action strategies and 36 framing CPA strategies. The most frequent action strategy was ‘Access and influence policy-making’ (27 times), with the mechanism ‘Attempt to influence policy processes and outcomes’ identified 21 times. The most common framing strategy was “the unacceptable, ‘bad’ solution: whole population, statutory” (19 times), by the mechanism “Policies are unnecessary & unacceptable” identified 7 times.

CONCLUSIONS

The role of CPA in the policy-making process points to the emergence of developing mechanisms to prevent, manage and mitigate industry interference aiming to protect and advance the health and food policy agenda.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_118

HOW EFFECTIVE ARE LAWS AND REGULATIONS IN IMPROVING FOOD SAFETY AND QUALITY? THE CASE OF CÔTE D'IVOIRE AND KENYA

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BACKGROUND AND OBJECTIVES

Food safety is essential for nutrition, as contaminated food compromises the ability to achieve healthy diets and perpetuates a vicious cycle of foodborne illness and malnutrition. Fresh fruits, vegetables, and animal source foods contribute to nutrition but are often contaminated by microbiological and chemical hazards in Africa. This study evaluates the effectiveness of food safety laws and regulations in Afica, focusing on fresh produce and processed fish in Côte d'Ivoire and milk in Kenya. The targeted foods are central to local diets but they also pose significant food safety challenges.

METHODS

The research applied a multidisciplinary approach: (i) reviewing regulatory frameworks and mapping key stakeholders, (ii) assessing microbiological and chemical contamination in food products through laboratory analyses (540 samples in Côte d'Ivoire) and literature review (milk in Kenya), and (iii) conducting qualitative interviews and workshops. Regulatory frameworks were evaluated for their alignment with public health goals and informal sector capacities.

RESULTS

In Côte d'Ivoire, the targeted foods were contaminated by microbial agents (e.g., *E. coli*, *Staphylococcus aureus*) and chemical agents (e.g., mercury, arsenic, pesticides, and polycyclic aromatic hydrocarbons). Some contaminant levels exceeded international standards but the risk of the hazard occuring is low for consumer. In Kenya, milk was frequently contaminated with biological hazards such as *Salmonella* and toxigenic *E. coli*, and chemical hazards like aflatoxins and antimicrobial residues, largely due to unhygienic handling and inadequate processing. Contaminations across both countries arose from poor production, storage, and distribution practices. Regulatory frameworks lacked enforcement capacity, alignment with the informal sector, and inclusivity in their design.

CONCLUSIONS

Unsafe food undermines nutrition by reducing the availability, safety, and nutrient quality of key food groups essential for health. Contaminated fresh produce and milk can contribute to micronutrient deficiencies and increased disease burden, particularly in vulnerable populations such as children. Strengthening food safety laws and regulations in Africa requires inclusive, risk-based approaches that account for the informal sector's capacities. Policies should prioritize health-focused interventions (e.g. education on safe food handling, low-cost technologies, improved access to clean water). Integrating nutrition-sensitive approaches into food safety policies can better safeguard public health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_119

CHALLENGES IN PROVIDING COMPREHENSIVE FISH AND SEAFOOD COMPOSITION DATA

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BACKGROUND AND OBJECTIVES

FISHEUTRUST (Project ID 101060712) is developing tools to maximise trust in fish and seafood quality, safety, and traceability, leveraging a range of smart technologies and genomic and isotopic methods as well as blockchain. These tools will be integrated into the FishEUTrust digital platform, providing a unified approach to traceability. More specifically, FISHEUTRUST wants to enhance understanding of nutritional quality and the role fish and certain seafoods in reducing the global burden of disease. To that end, EuroFIR is updating the SEAFOODTOMORROW dataset and supporting development of the FishEUTrust platform to facilitate data sharing with actors in the value-chain and consumers.

METHODS

The SEAFOODTOMORROW dataset (DOI 10.5281/zenodo.7825958; GA No 773400), initially established in 2018, is being updated using automated searches across 39 food composition databases (FCDBs), incorporating new countries and expanded fatty acid data. Harmonisation was achieved by standardising units, identifying outliers, and addressing duplication. Weighted averages are being calculated for nutrient values, and new datasets for fish and seaweed composition have been created, ensuring compatibility with emerging digital tools and technologies.

RESULTS

Updating the dataset revealed challenges, including inconsistencies in data formats, units, and nutrient definitions across FCDBs, as well as methodological variations in nutrient analysis. Missing data and gaps in coverage for fish– especially in low- and middle-income countries – and macroalgae species further highlight limitations in current datasets. Despite these issues, integration of additional data points and development of weighted averages will improve dataset comprehensiveness. These RESULTS will inform design of the FishEUTrust platform, ensuring delivery of accessible and reliable composition data.

CONCLUSIONS

Providing high-quality, harmonised fish and seafood composition data remains challenging due to methodological inconsistencies and data gaps. However, the updated SEAFOODTOMORROW dataset addresses some of these challenges by leveraging standardised methodologies and advanced digital tools. This work supports greater transparency, promotes consumer trust, and underpins research into the health benefits of fish and seafood consumption in Europe.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_120

SUSTAINABILITY IN FOOD-BASED DIETARY GUIDELINES: A REVIEW OF RECOMMENDATIONS AROUND MEAT AND DAIRY CONSUMPTION

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BACKGROUND AND OBJECTIVES
Citizens in high-income nations need to urgently change their dietary patterns. They need to move away from animal-based foods, particularly meat and dairy, and shift toward more plant-based diets, to reduce greenhouse gas emissions and land use from the food system. This could also have substantial health co-benefits (e.g., reduced risk of heart disease, stroke, and some cancers). Food-based dietary guidelines are country-specific and communicate nutrition recommendations to the public. However, it is not known how different countries' FBDG communicate reducing meat and dairy intake to citizens in the context of sustainability.

METHODS
We reviewed global consumer-facing dietary guidelines (n=58) to explore information and recommendations for reducing meat and dairy consumption in the context of sustainability, and the pictorial representation of these foods compared to other foods.

RESULTS
A minority of countries used a sustainability argument to recommend reducing meat (6/58) or dairy (2/58) intake. The proportion of meat images within visual food guides was consistently lower than dairy images. Furthermore, guidelines lacked specific actionable advice around sustainability and diet. Only a very small number of countries recommend reducing meat and/or dairy consumption.

CONCLUSIONS
Clearer guidelines backed by current evidence around both health and sustainability are needed. These guidelines should provide justification behind recommendations, actionable advice for meeting the recommendations, and appropriate quantified targets or limits of certain foods. This well-rounded advice is imperative to empower citizens to change their dietary habits, to reduce global meat and dairy consumption and shift towards more sustainable diets for human and planetary health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_121

PILOT TRIAL COMPARING FEASIBILITY AND EFFECTS OF TWO ALCOHOL CONSUMPTION RECOMMENDATIONS

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BACKGROUND AND OBJECTIVES

Alcohol consumption remains a significant public health challenge, with debates fueled by conflicting evidence on its health implications. While abstinence aligns with growing global advocacy for zero alcohol consumption, moderate drinking, particularly within the Mediterranean Alcohol Drinking Pattern (MADP), has shown potential health benefits. This study aimed to evaluate the feasibility and short- to medium-term effects of two contrasting public health messages—abstinence versus moderate MADP consumption—on behavioral changes and health outcomes.

METHODS

A pilot randomized controlled trial enrolled 103 participants, who were randomized to either abstention or adherence to the MADP. 76 participants completed the one-year follow-up. Outcomes included changes in alcohol consumption, binge drinking episodes, and health parameters, assessed through biochemical markers, anthropometric measures, and validated questionnaires addressing physical and mental health. Feasibility was also analyzed through recruitment and retention rates

RESULTS

Both interventions significantly reduced alcohol consumption and binge drinking episodes. The abstention group demonstrated greater reductions in total alcohol intake and improvements in blood pressure and liver enzyme markers. The MADP group showed better adherence to the MADP and a reduction in depressive symptoms. However, no statistically significant differences were observed between groups for these outcomes. Cognitive performance in the Mini-mental test was slightly higher in the abstention group (0.69 points [0.09 to 1.30], $p = 0.025$), but this difference was not clinically relevant. Recruitment and retention challenges, largely due to the COVID-19 pandemic, highlighted feasibility concerns, but also informed future trial designs.

CONCLUSIONS

Both abstention and adherence to the MADP effectively reduced harmful drinking behaviors and offered distinct health benefits. These findings underscore the need for larger, long-term trials to provide definitive public health recommendations regarding alcohol consumption.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_122

REFORMULATION OF FOOD PRODUCTS (THE EFFORT STUDY): A SIMULATION OF THE IMPACT ON NUTRIENTS INTAKE AND DIET QUALITY IN THE ITALIAN POPULATION

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BACKGROUND AND OBJECTIVES
Reformulation of food products is a promising strategy to reduce the intake of nutrients of concerns such as sugars, saturates and salt. Indeed, in many countries including Italy, a large proportion of salt, sugar and saturated fats in the diet comes from packaged foods. The EFFORT study, part of the OnFoods project (www.onfoods.it), aims at investigating the impact of different strategies of reformulation of food products in terms of intake of critical nutrients and diet quality.

METHODS
In the first steps, the main food categories contributing to the intake of critical nutrients have been evaluated and their content is being analyzed in food products currently on the Italian market based on the information reported on the food labeling. Then, strategies of reformulation have been hypothesized for different case-studies (e.g. biscuits and bread) to identify the potential impact of reformulated food products on nutrient intake. Finally, the impact of reformulating the food categories that contribute most to nutrient intake on diet quality using different dietary scenarios is assessed.

RESULTS
Up to three different strategies were identified to improve the nutritional quality of the different products under study: i) reformulation aimed at allowing the use of nutrition claims (e.g. decrease of sugars and saturated fat by 30%, and reduction of salt by 25%; ii) reformulation based on minimum levels of critical nutrients in top-selling products commercially available; iii) reformulation aimed at improving front-of-pack labels. When used to simulate the impact of such strategies on the reduction of the intake of specific critical nutrients, the reformulation aimed to allow the use of nutrition claims such as “reduced in salt” led to the major improvements in diet quality. As regards the reduction of salt intake, consuming reformulated bread in line with the Italian dietary guidelines produced a reduction up to 0.5 g/day. Similar impacts have been obtained for sugars by reformulating biscuits largely consumed in the Italian population. In addition, reformulation of plant-based alternatives significantly contributed at reducing the intake of at-risk nutrient such as sodium and sugar.

CONCLUSIONS
Reformulation of packaged foods can be optimized promoting potential win-win strategies for both the food industry and the consumers. Ongoing studies will show the practical benefits of different approaches on diet quality achieved by the consumption of reformulated food products.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_123

MOM-CARE: A PHASE III DOUBLE-BLIND, ADAPTIVE RANDOMIZED TRIAL OF ANTENATAL AND POSTNATAL MMSPLUS VERSUS STANDARD MMS AND IFA TO IMPROVE INFANT BIRTH OUTCOMES AND GROWTH

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BACKGROUND AND OBJECTIVES
Malnutrition remains a critical global challenge, disproportionately affecting maternal and child health in low- and middle-income countries. Recent evidence highlights the potential of optimizing multiple micronutrient supplementation (MMS) with key additions, such as NAD precursors, Choline, calcium (Ca), and DHA, to improve maternal and infant health. Findings from the MumtaPW trial demonstrated significant benefits of these vitamins and minerals, particularly on birth weight, stillbirths and neonatal mortality outcomes. The MOM-CARE trial aims to evaluate the impact of antenatal MMSPlus, enriched with NAD, Choline, calcium, and DHA, compared to standard MMS, and postnatal MMSPlus compared to standard MMS and IFA on infant health outcomes at birth and growth metrics at 6 months of age.

METHODS
This double-blind, adaptive randomized controlled trial will recruit 3,000 pregnant women from established surveillance sites within an Integrated Research Platform. Participants will be randomized during the antenatal phase to receive either MMSPlus or standard MMS and re-randomized postnatally into three groups (MMSPlus, standard MMS, or IFA). The primary outcome in the antenatal phase is a composite ordinal measure of infant health at 28 days of life, which includes categories ranging from stillbirth and neonatal death to preterm or term births with small-for-gestational-age (SGA) or appropriate-for-gestational-age (AGA) infants, and infant length velocity (cm/month) at 6 months. Secondary outcomes encompass maternal and neonatal morbidity, gestational weight gain, growth z-scores, and stunting prevalence. Data analysis will employ Bayesian cumulative logistic regression, with interim adaptive analyses conducted at predefined milestones.

RESULTS
This study utilizes an adaptive trial design to enhance efficiency, integrating key learnings from the Mumta PW trial and other research on calcium and DHA, to provide robust evidence for policy and programming in maternal and child nutrition.

CONCLUSIONS
MOM-CARE represents a critical step forward in addressing the global burden of malnutrition, with potential implications for scaling up maternal micronutrient supplementation programs worldwide.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_124

AN ANALYSIS OF THE DIETARY SOURCES OF FIBRE IN THE UK USING THE NATIONAL DIET AND NUTRITION SURVEY DATA ACROSS TIME (2008-2018)

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BACKGROUND AND OBJECTIVES

Dietary fibre provides many health benefits, despite this most people in the UK do not meet the 30 g/day fibre intake recommendation (1). The role of fibre intake in prevention of diseases like metabolic diseases and cancers is well established (2). Studies also show links between different food sources and types of fibre with metabolic pathways and gut microbiota (3). This highlights the importance of better understanding the different food sources and types of fibre consumed in diet to improve and personalise fibre recommendations for target groups. The objective of this study was to investigate the contribution of different dietary sources of fibre and how they differ across time.

METHODS

Secondary data analysis of the UK National Diet and Nutrition Survey (NDNS) data from Year 1 (2008/09) to Year 11 (2018/19) was performed. The contribution of NDNS main Food Groups to daily total fibre intake of the study population was calculated. The food items within each food group where then categorised to form new fibre focused food groups based on common characteristics, including main ingredient or cooking method. The percentage contribution of the new aggregated food groups to total fibre intake was calculated.

RESULTS

Our analysis confirmed that the average fibre intake of the population is below recommended levels and has not changed over time i.e. 18 ± 6.6 to 18.8 ±7.2 g/day. The contribution of food groups to total fibre intake has changed over time, these reflect differences in the number of consumers (either increased or reduced over time). However, three food groups did not follow this trend. Within main NDNS defined food groups, the contribution of foods to fibre intake has changed considerably from 2008, so has the number of consumers. For example, in the group “vegetables not raw” the fibre contribution and consumers of carrots declined by 2.8% and 7.9% respectively. Fibre contribution and consumers of other cooked vegetables like broccoli, beetroot and sweet potato increased whereas baked beans, swede and cauliflower decreased.

CONCLUSIONS

Dietary sources of fibre and their consumption have changed over time. A novel aspect of this study is the exploration of fibre intake of food items within the NDNS main groups across time. An interesting finding of this study is that the amount of fibre contributed by foods and the consumption of foods have both changed. This study will, in the future, focus on exploring yearly variations and the impact of demographic differences on the food sources of fibre.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_125

PROOF OF CONCEPT OF INCREASE VIABILITY CACO-2 CELLS EXPOSED TO A PROBIOTIC FERMENTED FRUIT JUICE

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BACKGROUND AND OBJECTIVES
Probiotics are live bacteria and when consumed adequately they exert beneficial effects on the host's health including gut mucosa. Is fermentation process a probiotic strains revitalization impacting the protective effect on cell model.

METHODS
Wild type Caco-2 cell line has been used as an in-vitro model of intestinal epithelial barrier. Monolayers of cell culture on 96 multiwell plates were exposed to hydrogen peroxide (H2O2), followed by co-treatment with or without probiotic fermented fruit juice. The protective effects of probiotic fermented juice against H2O2-induced oxidative damages have been assessed by MTT cell viability assay, according to Kit protocol. Also, cell cultures on Transwell inserts were exposed to bacterial lipopolysaccharide (LPS) and the LPS-disruption of cell monolayer integrity and tight junctions have been assessed via the measurement of transepithelial electrical resistance (TEER) and immunofluorescent detection of zonula occludens-1 (ZO-1) tight junction protein, respectively.

RESULTS
Our data showed that co-treatment with probiotic fermented juice significantly (P value <0.0027) prevented the reduction in percentage of cell viability in H2O2-treated Caco-2 cell culture model. In addition, we have shown that after 24 hours of LPS exposure, Caco-2 cell monolayer has shown significant lowering of TEER values, while these lowering of TEER values were attenuated upon probiotic fermented juice co-treatment. Furthermore, our data has also exhibited that LPS exposure led to the disruption of tight junction protein ZO-1, while these disruptions were prevented upon probiotic fermented juice co-treatment. These RESULTS indicate the effectiveness of probiotic fermented fruit juice in the protection of cells lining of gut mucosa.

CONCLUSIONS
To conclude, our RESULTS highlighted that the fermentation process of fruit and vegetables juice with probiotic consortia showed beneficial effects in protecting the damages of H2O2 and LPS-treated Caco-2 intestinal cell model, indicating a probiotic potential for this fermented fruit juice.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_126

MICRONUTRIENT POWDERS AND CONVENTIONAL FORTIFICATION: A BIOEQUIVALENCE TRIAL COMPARING THEIR EFFECTIVENESS IN IMPROVING SERUM ZINC LEVELS AND FUNCTIONAL OUTCOMES

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BACKGROUND AND OBJECTIVES
Zinc is an essential micronutrient playing a key role in human health. However, there is no robust evidence that zinc-fortified foods improve functional outcomes, even if the serum zinc concentration increase. We assessed the bioequivalence of conventional zinc fortification compared to micronutrient powders (MNPs) on serum zinc levels, recovery from wasting, morbidity and appetite among children with moderate acute malnutrition.

METHODS
A cluster randomized trial was designed to establish bioequivalence of MNPs to conventional fortification in improving zinc status, recovery from wasting, appetite and morbidity of children with moderate acute malnutrition aged 6-36 months in informal settlements, Kenya. Twelve villages were randomized to four study groups. Three experimental groups received different formulations of MNPs added to CSB; multiple micronutrients (MMN) containing Zn (CSB-sprinkle-MMNZn), MMN without Zn (CSB-sprinkle-MMN) and Zn singly (CSB-sprinkle-Zn). The control group received conventionally Zn-fortified CSB containing MMN. CSB was prepared centrally in each of the participating villages and enrolled children fed daily on the assigned formulation for a period of six months. Sample size was calculated to show bioequivalence within ±20% limit. A total of 346 children (MUAC ≥11.5 - <12.5cm) were enrolled CSB-sprinkle-MMNZn (N=84), CSB-sprinkle-MMN (N=88), CSB-sprinkle-Zn (N=93) and control group (N=81). Mixed effects linear regression was used to model pre-post change in serum levels, adjusting for age, sex and socio-economic status.

RESULTS
Compared to control group, the change in serum zinc levels was significantly lower for CSB-sprinkle-MMN (β= -20.0μg/dL; 95% CI: -26.5, -13.5) and significantly higher for CSB-sprinkle-MMNZn (β=5.9 μg/dL; 95% CI: 0.5, 11.3). Kaplan Meier disease-free survival and recovery from wasting were not significantly different among study groups (log rank test; p>0.05). Change in appetite scores was not significantly different among study groups (mixed effects linear regression; p>0.05).

CONCLUSIONS
Conventional fortification was not bioequivalent to MNPs in improving serum zinc levels. A significantly higher increase in serum zinc levels was observed among children receiving multiple micronutrient MNPs formulation. Conventional and MNP fortification interventions are effective in improving serum zinc levels with no significant effect on functional outcomes but may offer protection against future diarrhoea episodes and zinc losses.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO1_127

“WHAT GETS MEASURED GETS MANAGED”: INSIGHTS FROM THE GFDX ON LARGE-SCALE FOOD FORTIFICATION DATA

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BACKGROUND AND OBJECTIVES
The Global Fortification Data Exchange (GFDx) is a collaboration among four organizations working to reduce micronutrient malnutrition through food fortification. GFDx collects, collates, visualises and promotes the use of fortification data in 196 countries for five foods. GFDx indicators assess the fortification **opportunity**, the policy or regulatory **foundation** of fortification, and fortification **performance**. In 2024, after seven years of operation, a baseline assessment was conducted to map data availability in GFDx to guide future investments in fortification data.

METHODS
All data in GFDx was downloaded on 25 July 2024. We evaluated the availability of data for 15 indicators for all countries and foods, using pre-determined denominators and criteria for categorising availability.

RESULTS
Across all foods, GFDx has 95% of the data for food intake/availability and the food standard; 50% for proportion of the food industrially processed, 47% on compliance, 37% on population coverage of the fortified food and 36% on availability of heath impact. GFDx has 58%, 55%, 52%, 49% and 32% of of data on wheat flour, rice, salt, maize flour, and oil respectively.

CONCLUSIONS
Data gaps in GFDx exist because (i) GFDx has not identified an effective way of accessing available data, or (ii) the data do not exist as it has not been monitored or documented, potentially reflecting weaknesses in national fortification systems. By identifying data gaps, national and global fortification stakeholders can develop targeted strategies to improve data access and strengthen monitoring systems for national fortification efforts.

CONFLICTS OF INTERESTS
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EPO1_129

MICRONUTRIENTS ADEQUACY ACCORDING TO SIX DIET QUALITY INDICES IN AN ADULT COHORT

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BACKGROUND AND OBJECTIVES

Diet quality indices (DQI) tend to relate positively to micronutrient intake. Our aim was to investigate the association between six DQIs and inadequate intake for 19 micronutrients in an adult cohort.

METHODS

We assessed 16768 participants (59.3% women, 37.8 years mean age). Diet quality was evaluated using Dietary Approaches to Stop Hypertension (DASH); Mediterranean Diet Adherence Screener (MEDAS); Alternate Healthy Eating Index (AHEI-2010); Food-Based Global Diet Quality Score (GDQS); Alternative Mediterranean Diet Score (aMED) and Mediterranean Diet Score (MDS). Logistic regression analyses were conducted to estimate the probability of failing to meet Estimate Average Requirement (EAR) for either ≥ 3 or ≥ 6 micronutrients.

RESULTS

Overall, the lower and higher prevalence of inadequacy in fifth quintiles was for vitamins A, C, B1, B2, B3, B6, Fe, P and Cr, and for vitamins E and D, respectively. In the multivariable adjusted model, the OR for failing to meet ≥3 DRI for the highest versus the lowest quintiles of DASH, MEDAS, AHEI-2010, GDQS, aMED y MDS were: 0.03 (95 % CI 0.02 – 0.03), 0.06 (95 % CI 0.05 – 0.07), 0.10 (95 % CI 0.09 – 0.12), 0.05 (95 % CI 0.04 – 0.06), 0.03 (95 % CI 0.03 – 0.04), and 0.03 (95 % CI 0.03 – 0.04), respectively.

CONCLUSIONS

Adherence to six DQIs showed inverse associations with micronutrient inadequacy. Food-based DQIs could be a useful prevention tool. GDQS and MEDAS do not require deriving nutrient intake data, particularly MEDAS, which is even easier and quicker to fill out.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO1_132

EXPERTS' AND STAKEHOLDERS' INSIGHTS ON TARGETING STRATEGIES AND CHANNELS FOR MULTIPLE MICRONUTRIENTS (MMS) AND BALANCED ENERGY AND PROTEIN (BEP) SUPPLEMENTS DELIVERY TO ADOLESCENT GIRLS IN RESOURCE-LIMITED SETTINGS

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BACKGROUND AND OBJECTIVES

Multiple micronutrients (MMS) and balanced energy and protein (BEP) supplements are promising interventions to improve nutrient adequacy in adolescent girls in resource-limited settings. However, clear strategies for delivering MMS and BEP effectively and sustainably are lacking. We explored the barriers and success factors of delivery channels and mechanisms for MMS and BEP targeting adolescent girls in resource-limited settings and implementation strategies that could facilitate reaching underserved adolescent girls.

METHODS

A total of 40 experts from international technical advisory groups, government bodies from Burkina Faso and Ethiopia, non-governmental organisations, UN agencies, and supplement producers participated in in-depth interviews. Qualitative data analysis software NVIVO version 15 was used to examine transcripts for themes and contents. A coding team of 4 researchers developed a common understanding of the study objective and coding frame.

RESULTS

School systems and health facilities, regularly used channels to distribute supplements to adolescents, were considered unable to reach the most vulnerable ones (*i.e.*, out-of-school adolescent girls in rural areas). Community-based health workers and social marketing through pharmacies or health facilities were identified as the most effective channels and cost-sustainable mechanisms to reach underserved adolescent girls. Besides, the participants in this consultation draw attention to community adherence as a potential barrier and recommended strong awareness-raising. Furthermore, given the length of adolescence (*ca.* 9 years), they highlight the importance of targeting a narrow age range to ensure cost sustainability for both supplements. Unlike MMS, BEP were further recommended to be targeted toward adolescents diagnosed with clear malnutrition, areas with high malnutrition levels, and humanitarian settings to prevent energy overload and obesity. While no single channel was identified enough to reach all adolescent girls, governmental organisations have been recognised as key stakeholders in promoting adherence for supplement programs.

CONCLUSIONS

Multiple delivery channels (*e.g.*, governmental organisations, health facilities, schools, community-based platforms, NGOs, and UN agencies) and mechanisms (*e.g.*, social safety nets, social marketing, awareness raising, target segmentation) are required to effectively and sustainably deliver MMS and BEP to adolescent girls in resource-limited settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2 - Climate change, sustainability and nutrition

EPO2_004

ADDRESSING NUTRITION INSECURITY AMID GLOBAL WARMING: INSIGHTS FOR EFFECTIVE STRATEGIES

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BACKGROUND AND OBJECTIVES
Global warming and extreme meteorological events have direct impact on people's health and on the achievements of the Sustainable Development Goals (SDGs). The SDGs aim to address a range of social needs, including ending all forms of malnutrition in populations experiencing low-income. It is crucial to understand these populations´ health values and consumption habits, so nutrition interventions can be successful. This study investigated the food consumption profile and health concerns of a populations experiencing low-income in Brazil to suggest insights for sustainable solutions.

METHODS
A multicentric field study was conducted using combined quantitative and qualitative techniques, where trained interviewers applied structured questionnaires to perform a systematic collection of data about behavior, perception, attitudes, consumption habits and health concerns. The study engaged a total of 452 people equally distributed in 3 state capitals of Brazil: São Paulo (33%), Fortaleza (33%) and Salvador (34%). As inclusion criteria, only women and women with kids participated.

RESULTS
Most prevalent items that made up the composition of meals were rice (93%), bread (86%), chicken/beef/fish (89%), beans (82%), fruits (79%), pasta (75%), legumes (75%), milk (73%), butter (68%), juice (62%), cookies (58%), couscous (58%) and yogurt (52%). Common health concerns were tiredness (25%), overweight (24%), headache (23%), vision impairment (21%), hypertension (19%) and diabetes (15%). From a socioeconomic perspective, 76% of the women were 25 years-old or older, only 6% didn´t have children, 69% mentioned that the main source of income depended on their partners contribution.

CONCLUSIONS
The participants declared that rice was the most prevalent item in their meals, indicating a potential risk in case of rising sea level and consequent low rice production and price increase. On the other hand, it can represent an opportunity, as rice could be an excellent vehicle for enrichment with vitamins and minerals to enhance the nutritional density of meals and address some of the women´s main health concerns. Both scenarios need to be evaluated aiming to take strategic actions to secure food and nutritional security, and the achievement of the SDGs in the country.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_005

NUTRITIONAL PROFILES AND SENSORY PROPERTIES OF PLANT-BASED MILK ALTERNATIVES

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BACKGROUND AND OBJECTIVES
In recent years, the popularity of plant-based milk alternatives (PBMAs) has been increasing1, with the tendency to adopt PB diets that positively affect human and planet health. However, compared with cow's milk, nutritional profiling and sensory properties are among PBMAs' barriers to uptake2. The study aimed to determine healthy omnivore consumers' sensory assessments of PBMAs available in Türkiye and their nutritional values examination with cow's milk.

METHODS
PBMAs were selected from supermarkets in Ankara/Türkiye, and nine local products (almond/sugar-free, hazelnut/sugar-free, oat, coconut/sugar-free, soy/sugar-free) were reached. PBMAs' nutritional contents were on the label per 100 mL. Chilled (~4°C) PBMAs were coded and presented randomly in mouthful amounts (40-50 mL) in clear and odor-free plastic cups. Participants were recruited from Vocational School of Health Services students satisfying the study's inclusion criteria: willing to taste PBMAs, aged between 20-50 years old, having normal weight, not smoking, not allergic or intolerant to ingredients of PBMAs, and not pregnant or lactating. 17 semi-trained panelists tasted PBMAs in a suitable room with a neutral color, good ventilation, moderate lighting/temperature, and a safe distance from noise. PBMAs were evaluated using a 9-point hedonic scale (1= “dislike/not extremely” to 9= “like/yes extremely”).

RESULTS
Oat milk’s energy, carbohydrate, fat, soymilk’s protein, and coconut milk’s saturated fat were most like cow's milk. Calcium, vitamins B12 and E were the most frequently added micronutrients to PBMAs. PBMAs' main ingredient content was between 2.5-10%. Gender quotas were not implemented, and all panelists (n=17) were female with a mean age of 21.3±0.6 years. Oat milk [color (8.0/9), appearance (7.7/9)], hazelnut milk [flavor/taste (7.3/9), odor/smell (7.8/9)], and almond milk [texture (7.4/9)] were the most liked PBMAs. No sugar soy milk was the most disliked PBMA, and panelists (94.1%) stated never consuming it again.

CONCLUSIONS
Adding plant protein and increasing the main ingredient would be beneficial to improve PBMAs. Moderate sugar addition in soymilk significantly improved the sensory properties of the product. The variety of PBMAs to be produced towards consumers' recommendations should be increased in markets.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_006

TEACHER TRAINING FOR HEALTHY AND SUSTAINABLE EATING: KITCHENS AND CHILDHOODS PROJECT

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BACKGROUND AND OBJECTIVES

Introduction: The Human Right to Adequate and Healthy Food is one of the most elementary rights enshrined in the Brazilian Federal Constitution. The topic is regulated directly or indirectly within a legal framework that has mirrored a series of federal public policies, such as the National School Meal Program in Brazil. Sadly ironic, in contrast to “Zero Hunger”(SDG2), a modern face of malnutrition has been emerging in the field of food security: the dizzying growth in the incidence of chronic non-communicable diseases related to overweight. This scenario can be explained by the extreme concentration of the agro-industrial production model corroborates extreme climate events, impressing upon humanity the sad condition of a global syndemic.
Objectives: Develop and evaluate a training program for early childhood education educators, based on the concept of Knowledge about the History of Human Food and the History of the formation of Brazilian culinary culture, Domestic Culinary Skills and Healthy Eating, using the Food Guide as a reference for the Brazilian Population with a systemic education approach, in order to demonstrate its effectiveness in implementing Food and Nutritional Education (FNE) from early childhood in schools, with the aim of strengthening good habits and food choices, such as indicates law Nº 13.666/18.

METHODS

Methodology: The pedagogical intervention strategy,“Kitchens & Childhoods”,was developed through a conceptual theoretical model of the Integral Theory that promote the expansion of knowledge in its pedagogical matrix. A set of synchronous classes and a face-to-face meeting are taught over a semester to educators and nutritionists from the SP municipal early childhood education network, aiming to provide educators with training to develop dynamics related to the topic of food. Two assessment instruments validated by the Faculty of Public Health will be applied at the baseline and in the final stage, the Domestic Culinary Skills Scale and the GAB instruments, based on three different constructs from the Food Guide for the Brazilian Population. Pedagogical practices will be analyzed.

RESULTS

RESULTS: Effectiveness of the pedagogical matrix, effective reduction of teachers without culinary skills, from 14%, to just 4% at the end of the program.

CONCLUSIONS

The need to train public school educators in EAN with a view to planning actions and public policies that promote students' autonomy to make healthy food choices in favor of security, food and nutritional sovereignty and climate security.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_007

OPEN-ACCESS HARMONIZATION OF AGRIBALYSE AND FNDDS: DEMOCRATIZING SUSTAINABLE DIET SERVICES

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BACKGROUND AND OBJECTIVES

Harmonizing environmental and nutritional databases (DB) is a crucial step toward building a sustainable society by enabling eco-friendly and health-conscious food choices. Despite substantial public funding, some efforts remain closed-access[Muzzioli-Nature2024], or behind paywalls[EuroFIR-Fee]; fortunately, there are free- and open-access DB like France's Agribalyse, focused on Life-Cycle Assessment (LCA), and the USA's FNDDS, focused on food composition. In this context, our work presents both an advanced AI-driven methodology for efficiently merging and maintaining food DBs, and a fusion of Agribalyse/Ciqual with FNDDS to empower applications (over +300,000 health and fitness apps in stores) with LCA insights in nutritional guidance.

METHODS

We designed a original pipeline to map food labels across DBs, focusing on the natural aliments of Agribalyse and FNDDS due to their widespread use. Our pipeline integrates four AI-driven algorithms: (1) text embedding similarity, (2) fuzzy string matching, (3) food nutritional similarity, and (4) semantic label matching using a Large Language Model (LLM). A web-based interface allows experts to correct these mappings, with their aggregated votes determining final decisions. When Agribalyse or FNDDS are updated, about once a year, experts can focus only on the changes and on the previous mappings that they rated as *unsatisfactory*, saving time by not reviewing the *satisfactory* ones.

RESULTS

After correcting the AI mappings, experts rated 87% of the final mappings as *satisfactory*, which is thus the current degree of harmonization of the two DBs. Among these satisfactory mappings, 58% are rated as *excellent*. Experts have corrected 24% of *satisfactory* mappings, but only 17% of *excellent* mappings : thus our AI pipeline accuracy is between 76% and 83%. Our harmonized DB enables us to examine differences in dietary habits and environmental impacts between French and American populations.

CONCLUSIONS

This study demonstrates an operational pipeline for harmonizing heterogeneous nutritional DBs. Our free and open Agribalyse-FNDDS fits a versatile model for future DB harmonization projects, addressing the need for accessible and freely available scientific knowledge among small but numerous stakeholders.

CONFLICTS OF INTERESTS

The authors declare having financial interests and personal relationships with JAD, the company developping a mathematical model of a rational food consumer for providing sustainable diet services

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data availability and accessibility of food entries (FI) from the LCI database Agribalyse and selected food composition EuroFIR databases were analyzed. Harmonized food names from LanguaL™ codes from food classification systems were gathered and validated manually in order to use as descriptors to tag database entries in an automated way. Both databases, EuroFIR and Agribalyse, provided sufficient amount of meta data to interlink FI with the standardization approach proposed. Information on food name, food specification, food processing and the type of production was used for data interlinkage purposes. Manual validation of data interlinkage showed that two out of a sample of 54 entries were found to have incorrectly assigned descriptors. Agreeing on common principles (e.g., use of a specific classification system, common database formats) and improving meta data availability would facilitate database interlinkage and improve both, accuracy and efficiency. Developing solutions to increase meta data availability and accessibility of FI in food databases should become a key area of research in order to transition into more reliable database connection systems.} }

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EPO2_008

DIFFERENCES IN THE LEVEL OF INTEREST IN GLOBAL ENVIRONMENT AND FOOD CRISES, AND IN ONE'S OWN DIETARY HABITS INFLUENCE THE ACCEPTANCE OF ENTOMOPHAGY AMONG UNIVERSITY STUDENTS

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BACKGROUND AND OBJECTIVES
The FAO report of 2013 identified entomophagy as a promising solution to the food crises. This has led to a worldwide increase in the momentum for research on insect food. In Japan, the number of young people who are interested in environmental impact has increased. In addition, a way of thinking unique to today's young people has emerged regarding dietary control. Not drinking alcohol and practicing protein intake such as chicken breast on a daily basis is recognized as a kind of status. Therefore, we investigated the awareness of eating insects as a substitute for meat, interest in the global environment and the food crises among university students. At the same time, we analyzed the relationship between awareness of health and nutrition issues, dietary habits and acceptance of insect food.

METHODS
We conducted a questionnaire survey of a total of 435 university students majoring in food science and students of nutritionist and national registered dietitians training facility. The survey was performed between May and July 2024. Differences in students' opinion about global environmental issues and food crises, dietary habits, and awareness of insect food were investigated. Descriptive statistics were calculated for the survey responses using SPSS software.

RESULTS
69.9% of the students answered that they were interested in the global environment, and the most common place to learn about the problem was "high school" (74.5%). 81.4% of students answered that they were concerned about the global food crisis, and the most common place to learn about the problem was "high school" (51.7%). They answered entomophagy was "rich in protein" (66.9%), "rich in minerals" (47.8%), and "saving food crises" (55.9%). However, 72.4% of them replied negatively to the question "I want to try it.". Interest in environmental issues and food crises and interest in insect food were both positively correlated. There was also a correlation between dietary scores and interest in insect food.

CONCLUSIONS
It was suggested that learning about the global environment and food crises in junior and high school will continue to interest students in these issues and stimulate their interest in solutions. However, it has become clear that, despite understanding entomophagy is a solution to these problems, their aversion to entomophagy persists.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_009

THE DEMOCRATIC REPUBLIC OF CONGO'S FOOD AND ENVIRONMENT NEXUS

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BACKGROUND AND OBJECTIVES

The Democratic Republic of Congo (DRC) is a country rich in natural resources, but faces major challenges in terms of nutrition and the environment. Understanding the link between these two aspects is crucial to improving the living conditions of the Congolese people.

METHODS

To analyse the link between nutrition and the environment in the DRC, we examined published data on malnutrition and environmental practices, as well as case studies of local initiatives. Statistics on malnutrition and the main agricultural crops were used to illustrate the impact of environmental mismanagement.

RESULTS

Impact of the Environment on Nutrition: Deforestation reduces sources of animal protein and River pollution affects fishing.
Population dependence on natural resources: Around 70% of the population depends on subsistence farming agriculture; Overexploitation of natural resources exacerbates food insecurity.
Effects of Malnutrition on the Environment: 3,3 million children under 5 suffer from acute malnutrition; Unsustainable agricultural practices degrade soil.
Malnutrition statistics in the DRC: 3.3 million children under the age of 5 suffer from acute malnutrition; 27.3 million people are acutely food insecure.
Main crops affected:

- Cassava: Affected by deforestation and land degradation.
- Maize: Affected by deforestation and unsustainable farming practices.
- Rice: Affected by river pollution.
- Beans and peas: Affected by loss of soil fertility and climate change.

Initiatives to improve nutrition and protect the environment: Projects to combat food and nutritional insecurity; Promotion of good nutrition and hygiene practices.

CONCLUSIONS

The relationship between nutrition and the environment in the DRC is complex and interdependent. Promoting sustainable practices that protect the environment while meeting people's food needs is essential to improving food security and nutrition. Collaboration between local communities, non-governmental organizations, and the government is crucial to achieving these goals.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

1. https://cafi.org/fr/pays-partenaires/democratic-republic-congo/sustainable-agriculture-policy
2. https://www.unicef.org/drcongo/communiques-presse/enfants-malnutris-aigus-rdc-pas-acces-traitement
3. https://www.unicef.org/drcongo/communiques-presse/enfants-malnutrition-aigue-2021

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EPO2_012

A Dutch Survey Tool Adapted to Assess Factors Influencing Meat Consumption by U.S. College Students: Validation and Pilot RESULTS

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BACKGROUND AND OBJECTIVES

Generation Z (those born between 1995 and 2010) is a growing consumer group gaining independence with their dietary decisions. Understanding this generation's dietary habits is critical for addressing human and environmental health concerns. However, few validated surveys exist that examine meat-consumptive behaviors and factors associated with these behaviors among Gen Z college students in the U.S. The objectives of this study were to (1) adapt and validate a Dutch survey tool to ensure suitability for a U.S. college student population, and (2) assess pilot data to explore the dietary patterns of U.S. Gen Z college students, their intentions to reduce meat intake, and factors that influence meat consumption using a behavioral theoretical framework.

METHODS

A Dutch survey tool (61-item; van den Berg et al., 2022) was validated with student and professional reviews, and by piloting the survey at a large midwestern college. An exploratory factor analysis was used for item reduction and Cronbach's alpha measured reliability of six piloted survey categories. Descriptive statistics were utilized to understand dietary patterns, meat consumptive habits, and intentions to reduce meat intake. We assessed which demographic factors (4 items) and behavioral constructs (six categories; 18 items) best explained weekly meat intake using generalized linear models (GLM) and Akaike Information Criterion (AIC) to compare support for different models.

RESULTS

The final instrument included 39 items, and Cronbach's alpha values exceeded 0.7 for six assessed survey categories. Most (84%) participants identified as omnivores and less than half (44%) reported eating meat 6 – 7 days per week (n = 284). Most (64%) were satisfied with their weekly meat intake and over half (53%) were unlikely to reduce their meat intake over the next five years. Demographic factors did not appear to influence meat consumptive habits. However, comparisons of AIC scores suggested weekly meat intake was best explained by a model with automatic motivation, psychological capability, and the interaction of the two.

CONCLUSIONS

The modified Dutch survey tool and its underlying theoretical framework was applicable to a U.S. college student population. Preliminary RESULTS indicate that most participants eat meat and are reluctant to reduce their meat consumption. Students with both high automatic motivation (e.g., impulsive behavior) and low psychological capability (e.g., knowledge and cognitive skills) had the most frequent meat consumption.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

1. van den Berg, S. W., van den Brink, A. C., Wagemakers, A., & den Broeder, L. (2022). Reducing meat consumption: The influence of life course transitions, barriers and enablers, and effective strategies according to young Dutch adults. Food Quality and Preference, 100(2),104623.

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EPO2_013

UNDERSTANDING THE CHALLENGES OF AFFORDABILITY FOR A HEALTHY DIET IN THE SAHEL (BURKINA FASO, NIGER, AND MALI)

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BACKGROUND AND OBJECTIVES
Burkina Faso, Niger, and Mali are facing persistent food and nutrition insecurity, exacerbated by climatic shocks, high and volatile food prices, rapid population growth, and civil insecurity. More than half of Sahelian households cannot afford a healthy and nutritious diet, with this proportion rising to four out of five households during the lean season.
To understand the challenges faced by low-income households in accessing healthy foods in the current food environment in the Sahel

METHODS
This study relies on data collected from the CILSS/WFP pilot study (January to July 2024) in Burkina Faso, Mali, and Niger. It examines the cost of dietary regimes and households' economic capacity, accounting for contextual factors and market access. Costs of energy-dense and healthy diets were calculated using market monitoring and food expenditure data. The analysis covers 123 markets in 29 regions across the three countries and includes a linear regression for the impact of food group prices on affordability and a variance analysis for the costs of different dietary regimes.

RESULTS
Limited access to affordable and quality foods, along with seasonal constraints in the context of civil insecurity, are the main barriers to healthy eating. Economic and spatiotemporal factors are significant, but personal factors also play a role. Seasonal variation showed significant increases in the costs of both diets between January and July in Burkina Faso and Mali. In Niger, there was a significant increase in the energy-dense diet cost and a decrease in the healthy diet cost. Certain food groups were significantly associated with diet costs and non-affordability differently across the countries.

CONCLUSIONS
The food environment in the Sahel strongly influences the affordability of a healthy diet, impacting food and nutrition security. Economic conditions, geographic location, seasonality, food availability, and civil insecurity are the key determinants. Future research on longitudinal approaches to track changes in access and affordability over time is recommended

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_014

FACILITATING SUSTAINABLE DIETARY SHIFTS BY EXPLORING CONSUMER EATER PROFILES

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BACKGROUND AND OBJECTIVES
Food system activities, from farm-to-fork are among the major contributors to climate change. Because livestock-based foods contribute greatly to climate change, meat-heavy dietary patterns are problematic. To shift dietary patterns towards more sustainable food choices, understanding consumer food perceptions and choices is critical for decision-makers. This study provides insight into the characteristics of XXX eater profiles and identifies the underlying food environment factors impacting their food choices. The findings can inform a more targeted intervention design, which increases the chances of successfully promoting sustainable food choices and creating a dietary shift.

METHODS
An online survey was conducted, which targeted the recruitment of a representative sample of the XXX population. The survey included questions related to (1) socio-demographic data, (2) factors influencing food choices (grounded in Social Cognitive Theory), and (3) diet characteristics of the respondents. An Exploratory Factor Analysis (EFA) was performed to reduce the number of variables (factors influencing food choices) and identify the main determinants (latent variables) of eating behaviours among the respondents. K-means cluster analysis was used to create eater profiles, by segmenting the respondents into clusters with similar behavioral patterns, based on the importance placed on the identified factors in their eating behaviours.

RESULTS
Overall, 3,329 respondents were included in the study. Using EFA the determinants of food choices among the target population, were reduced to five factors including Sustainability and Health, Food Influencers, Joy and Pleasure, Convenience and Familiarity. For the eater profiles, six segments were identified which were (1) The concerned consumer (22.5%), (2) The trend and tradition-follower consumer (18.9%), (3) The conventional consumer (17.5%), (4) The “eat what you love” consumer (16.0%), (5) The sustainable healthy consumer (15.6%), and (6) The convenience seeker (9.4%).

CONCLUSIONS
RESULTS from the study, enable decision-makers and stakeholders to pinpoint approaches for dietary shifts that could contribute to a sustainable food system. The findings highlight the importance of developing well-rounded, segment-specific interventions while creating food environments that facilitate/promote sustainable food choices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_015

BEYOND THE DESICCATION——PROBLEMS OF FOOD SOURCES AND THEIR CORRESPONDING NUTRIENT DEFICIENCY-RELATED DISEASES CAUSED BY THE SHRINKING ARAL SEA

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BACKGROUND AND OBJECTIVES
Desiccation of the Aral Sea, as one of the most severe ecological disasters in the world, has always been the focus of investigators. Closely related to the desiccation, the health problems, especially those nutrient deficiency caused by problematic food sources have always been ignored.

The purpose of this study is to comprehensively review the food source problems caused by the shrinking Aral Sea, and how did these problematic food lead to nutrient deficiency-related diseases of the locals. Besides, I will make a comparison between the local patients and those 'normal' people.

METHODS
In this study, I comprehensively reviewed the food source problems caused by the shrinking Aral Sea, and the ways that these problematic foods lead to sicknesses of the locals. Moreover, I conducted detailed assessments of the diseases and proposed their leading factors, population characteristics, and possible remedies.

RESULTS
Food shortage and drinking water contamination were two primary factors that led to nutrient deficiency-related sicknesses in the Aral Sea regions. Evidence showed that both grain and fish productions, especially the production per capita, in Kazakhstan,Turkmenistan, and Uzbekistan, had been drastically declining (>70%) in the 1990s because of the shrinking Aral Sea.

CONCLUSIONS
Investigations found out that three types of problems including malnutrition, chronic diseases (Anemia, Cardiovascular Diseases, and Cancer), and waterborne diseases (Diarrhea, Typhoid, and Hepatitis) were frequently reported from 1988 till now. Moreover, assessments indicated that newborns and school-aged children were more likely to get sick than adults. Besides, the overall conditions of the problems in the North Aral Sea region were more severe than those in the South. Further assessments displayed that the problems were caused not only by diet-led factors but also environmental and social-economic ones. Therefore, the government should put more efforts to raise both health and hygiene awareness of the locals.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_018

DAIRY CONSUMERS SHOW COGNITIVE DISSONANCE BETWEEN ATTITUDES, KNOWLEDGE AND BEHAVIOURS RELATED TO DAIRY PRODUCTS: FINDINGS FROM A CROSS-SECTIONAL SURVEY OF UK ADULTS

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BACKGROUND AND OBJECTIVES
Milk provides energy, high-quality protein and a range of micronutrients. However, its production has ethical and environmental concerns, notably methane emissions from enteric fermentation. Changes to farming practices can improve the nutritional qualities of milk and its sustainability, with opportunities for innovation. This study explored consumer willingness for improved products, and the interrelationships of knowledge and attitudes towards the dairy industry in relation to purchasing and consuming dairy products.

METHODS
We conducted an online survey of UK adults from November 2021 to March 2022, covering knowledge and attitudes towards dairy, dairy consumption, likelihood to purchase improved milk, and socio-demographics. Participants were classified as low or high dairy consumers if intake was below or above two portions of dairy per day. Multiple choice questions assessed knowledge, whilst attitudes were evaluated using 5-point Likert items. Differences between high and low consumers were examined using Mann-Whitney U statistical tests.

RESULTS
The survey received responses from 706 dairy consumers, of whom 42% reported consuming two or more portions of dairy products daily. Participants had a positive attitude towards dairy farmers, particularly their role in ensuring UK food security (91% ‘agree’ or ‘strongly agree’) and maintaining high animal welfare standards (84% ‘agree’ or ‘strongly agree’). There was greater agreement (20% greater, $p<0.001$) for these two aspects in high dairy consumers. Conversely, greater agreement (18% greater, $p<0.001$) for statements relating to the negative environmental implications of dairy production (e.g. methane emissions) was found for low consumers. Supermarket own-brand milk dominated habitual purchasing (75% often or always), with price having the greatest influence on behaviour. However, when presented with descriptions of milk with differing production standards, 50% of participants favoured the product that displayed fair trade standards, improved welfare and sustainability, nutritional enrichment through cows’ diet, production location, and a novel quality assurance brand, regardless that this product had the highest price per litre.

CONCLUSIONS
Despite concerns about animal welfare and intention to purchase products with improved ethical and trade standards, most consumers seldom purchased products carrying information about these traits. Our findings indicate an intention-behaviour gap between consumer values and behaviours, possibly explained by misperceptions about the impacts of dairy production or the limited opportunities to purchase improved milk.

CONFLICTS OF INTERESTS
E. Combet: has received funding for research from the Alpro Foundation and from Valorex and ForFarmers UK Ltd to support this studentship and has collaborated with Seaweed&Co and Napiers on projects focusing on iodine.S. Gray: has received funding for research from Aker Biomarine and Kappa BioscienceJ. Renaud: Employed by Bleu-Blanc-CoeurS. Mendowski: Employed by Valorex.M. Barnard: previously recipient of studentship part funded by Valorex and ForFarmers UK Ltd.H. Bracey: is the recipient of a studentship part funded by Valorex and ForFarmers UK Ltd.

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EPO2_020

CHICKPEA ANTINUTRITIONAL PROFILE DEPENDS ON AGRONOMIC CONDITIONS AND IMPACTS FAT-SOLUBLE MICRONUTRIENT BIOACESSIBILITY

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BACKGROUND AND OBJECTIVES

Consuming more legumes as substitutes for meat may enhance the sustainability of our diet [1]. However, legumes contain bioactive compounds that are considered "antinutrients" because they alter micronutrient bioavailability. Optimizing chickpea processing reduces antinutrient levels but is insufficient to improve fat-soluble vitamin bioavailability [2]. Our objectives were thus to determine the impact of agronomic conditions (culture localisation, varietal choice and year) on chickpea antinutrient profile, and to assess the impact of contrasted antinutrient profiles on fat-soluble micronutrient bioacessibility.

METHODS

Chickpea samples of 4 different varieties, cultivated in different French departments, were collected two consecutive years (2023 and 2024). Their raw phytate, saponin and tannin contents were assessed by indirect spectrophotometry. Nine samples of 2023 harvest were selected for their contrasted antinutrient profiles. They were soaked and cooked in water prior to their incorporation in a fat-soluble micronutrient-rich recipe (vitamins E, D and carotenoids). Chickpea antinutrient content was also measured after cooking. Samples of this recipe were submitted to a static *in vitro* digestion. Micronutrient bioaccessibility was estimated as the ratio of amounts in mixed micelles to those in digesta, quantified by HPLC or LC-MS/MS. 3 samples from 2024-harvest, matching the variety and culture localisation as 2023, were submitted to the same cooking, digestion and bioaccessibility assessment.

RESULTS

A crossed varietal and localisation effect was found for saponin, tannin and phytate contents in raw chickpeas in 2023. There was no correlation between raw and cooked saponin and phytate contents for the 9 selected varieties, but negative correlation was observed for tannins ($r=-0.782$, $p=0.013$). Positive correlations between raw and antinutrient loss by cooking were also noticed. The vitamin D bioacessibility from meals containing antinutrient-rich chickpea was significantly lower than that from meals containing antinutrient-poor chickpeas (5.3±5.1% vs. 28.3±6.9%, respectively). This was also observed for carotenoids (lycopene, β-carotene and zeaxanthin) and tocopherols (α- and γ-) naturally present in the recipe. Analysis for 2024-chickpea samples are currently in progress.

CONCLUSIONS

Agronomic conditions appear critical for the modulation of chickpea antinutrient content. In agreement with previous studies, raw antinutrient-rich profiles tend to cause lower fat-soluble micronutrient bioacessibility than poor profiles. This study reinforces the importance of considering the impact of increased legume intakes on micronutrient bioavailability.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_021

INNOVATIVE DEVELOPMENT OF INDIGENOUS CROP-BASED DISHES TO ENHANCE CONSUMPTION AMONG PRIMARY SCHOOL CHILDREN"

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BACKGROUND AND OBJECTIVES

Consumption of indigenous crops and dishes is low among the youth and children. Traditional preparation methods seem not to appease the young generation. The study focused on creating innovative vegetable dishes using three indigenous crops, with the goal of encouraging children to consume these nutritious foods.

METHODS

A quantitative approach was used, using traditional preservation, experimental, and laboratory methodologies, to develop recipes and perform nutrient analysis. This involved developing dishes from three leafy vegetables (*Amaranthus, Bidens Pilosa* and Cowpea) to yield the *Amaranthus* cabbage, *Bidens* dumpling, and Fishpea. Nutrient analysis was done at the Aspirata/NOSA testing laboratory in Cape Town, South Africa.

RESULTS

Sensory evaluation RESULTS revealed that all three dishes were acceptable and liked by children for all three attributes of colour, taste, and smell, with *Amaranthus* cabbage being the highly acceptable dish for all three attributes. The RESULTS on the palatability of the three dishes using open-ended questions affirm that more children had positive comments on the dishes, which concurs with the quantitative data. Adherence to consumption of the indigenous dishes was also high and signified less plate waste for *Bidens* dumpling than the other dishes. Nutrient analysis indicated that the three crops yielded acceptable amounts of proximates and selected vitamins and minerals.

CONCLUSIONS

Innovation and culinary services in developing recipes using Indigenous crops can improve the consumption and diversify the diet of primary school children.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_022

SUSTAINABILITY IN HOSPITAL NUTRITION: USE OF ORGANIC FOODS IN THE PRODUCTION OF DIET THERAPY IN A HOSPITAL

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BACKGROUND AND OBJECTIVES

The path to sustainable hospital diets goes through agriculture, planetary health and the production of diet therapy. Because of an unsustainable food system that does not respect biodiversity, there has been an unbridled change in the quality of the diet, classified as the fourth cause of DAYLs (Disability Adjusted Life years). A sustainable diet can reduce water use, minimize CO2 emissions, promote biodiversity, traditional values, locavorism and are equally nutritionally rich. The objective of this study was to stimulate the insertion of sustainable foods in the production of diet in a hospital in Brazil, training the different actors involved in menu planning, purchasing and cooking.

METHODS

Intervention project, single center applied in 3 stages involving: (1) the organization of an agroecological fair; (2) Technical visit for qualification of agroecological suppliers (3) practical training that involved buyers, nutritionists, cooks, assistants and hospital unit cupbearers. The goals were categorized and divided as follows: (1) Articulate spaces of approximation. Tool: Agroecological Fair for the exhibition of local farmers. Indicator: number of editions / number of exhibitors. (2) Stimulate agroecological purchase. Tool: Technical visits in the field – focus on supplier qualification. Indicator: number of hospitals participating /technical visit. (3) Train actors involved in the Hospital Diet production chain. Tool: Theoretical/practical training.

RESULTS

12 editions of the Agroecological Fair were held, promoting articulation with more than 80 local farmers/producers. We carried out 5 technical visits in sustainable agriculture with 144 nutritionists representing 70 Brazilian hospitals, who facilitated the insertion of organic green banana (biomass) and green banana peel (culinary preparation) with a focus on the integral use of food in the production of diets in the Hospital Complex of a Brazilian municipality. Menu planning, purchasing, kitchen, pantry and clinical nutritionists were trained.

CONCLUSIONS

It was possible to stimulate the insertion of agroecological foods by proposing change based on the choice of a food. It contributed to the adhesion of the project, the awareness of the entire team, starting with the planning of the menu, purchase, receipt, cooks and finally the pantry team that delivers the food to the patient.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_023

DEVELOPING SUSTAINABLE FOOD BASED DIETARY GUIDELINES FOR LEBANON: INTEGRATING HEALTH, ECONOMIC RESILIENCE, AND SUSTAINABILITY

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BACKGROUND AND OBJECTIVES
Background: Developing Sustainable Food-Based Dietary Guidelines (SFBDGs) aligned with sustainable healthy diets (SHDs) is critical for addressing food and nutrition insecurity, mitigating diet related diseases, improving public health, and promoting environmental sustainability. Lebanon, a low-middle-income Eastern Mediterranean country, faces significant challenges including high prevalence of food insecurity, wide-spread noncommunicable diseases, limited land and water resources and ongoing economic and environmental crises.
Objective: To develop culture-specific SFBDGs for Lebanon aligned with recommendations for SHDs, integrating health, nutrition, economic, and environmental factors.

METHODS
Methods: The SFBDGs were formulated using a diet optimization mathematical tool which generates patterns resembling current diets while satisfying nutritional health, cost, and environmental footprint (EFP) constraints. Data from the latest national food consumption survey of Lebanese adults served as the reference for current food consumption pattern. Nutritional constraints were based on EAT-Lancet and World Health Organization (WHO) recommendations and Dietary Reference Intakes (DRIs). Cost constraints were maximized to match the cost of food groups within the current consumption pattern, while EFP constraints were based on the environmental impact of these food groups. The optimized consumption was later translated into SFBDGs.

RESULTS
RESULTS: Compared to current national consumption, the optimized diet recommended increases in whole grains (+287%), dairy products (+61%), legumes (+50%), and fish (+26%) and reductions in refined grains (-66%), red meat (-65%), poultry (-32%), and added sugars and fresh fruit juices (-12%). Diet optimization led to a reduction in calorie intake (-6%) and EFPs, including greenhouse gas emissions (-24%), energy use (-7%), and water use (-6%), while maintaining cost.

CONCLUSIONS
CONCLUSIONS: The developed optimized diet and resulting Lebanese SFBDGs addressed health, nutrition, economic, and environmental sustainability of current food consumption pattern, providing a scientific foundation for policies promoting SHDs that are affordable and culture-specific, which can mitigate food insecurity and malnutrition and alleviate some of the country's challenges.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_024

DIET THERAPY AND SUSTAINABILITY: EVALUATION OF THE ECOLOGICALLY CONSCIOUS BEHAVIOR OF NUTRITIONISTS IN HOSPITAL

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BACKGROUND AND OBJECTIVES

Professionals working in health-related institutions can influence nutrition policies and implement interventions if they have the knowledge and awareness of sustainable nutrition. This research is part of a doctoral project on the implementation of sustainable diets in hospitals in Brazil. Identifying the level of ecologically conscious behavior of nutrition professionals can guide the methodology of the main survey since people ecologically engaged in their households tend to favor professional projects focused on sustainability. The objective of this study was to verify the level of conscious consumption behavior of professional nutritionists who work with diet therapy in hospitals.

METHODS

Descriptive research with a quantitative approach, using an Ecologically Conscious Consumer Behavior (ECCB) scale adapted to the Brazilian context, with a web survey, applied to Hospital Nutritionists and conducted between the months of May and August 2023. Construct with 3 hypotheses: H1: Concern with health is directly related to the attitude towards recycling. H2: The concern with recycling is directly related to the attitude towards change. H3: Concern with health is directly related to the attitude to change.

RESULTS

535 questionnaires were sent and 226 were answered. The predominant age group was 31 to 40 years, representing 40% of the respondents, and 49% worked in large hospitals. The significant relationships between the constructs proposed in the hypotheses (H2:H3) were positive, which shows knowledge and concern when it comes to food and consequences for one's own health and environment. A low level of concern was observed regarding the material used in the product and packaging and its impossibility of recycling (H1).

CONCLUSIONS

The standard deviation was 1.65, a high standard deviation for a Likert scale of 1 to 7, demonstrating that there are two groups of consumers who are very different from each other, those who are highly aware and those who have much more utilitarian motivations. That is why Food and Nutrition Education should be increasingly promoted with a focus on sustainability in this group of professionals who are responsible for prescribing and disseminating healthy eating. Considering that nutritionists are an educator for healthy and sustainable eating, future research is important to have a representation of the population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_025

THE EFFECT OF INSECT ADDITION AND SEASONING ON THE EVALUATION OF CAKES: A STEP TOWARD PROMOTING INSECT CONSUMPTION

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BACKGROUND AND OBJECTIVES
In May 2013, the FAO highlighted insects' potential for addressing food crises due to their nutrition, economic, and environmental benefits. However, insect consumption remains limited in Japan. This study aims to conduct a preliminary investigation to promote the acceptance of insect-based foods among Japanese women by utilizing cakes, which are popular among young women.

METHODS
In November 2023, a sensory evaluation was conducted with 11 students from the Faculty of Home Economics at University O. The evaluation consisted of two parts:
(1) Evaluation of Insect Content: Baked cheesecakes containing 10g and 20g of three types of insects—Acheta domesticus (house cricket), larval Vespa analis (small Japanese hornet), and bamboo worms—were prepared. Participants consumed and rated each sample..
(2) Pound cakes combining Acheta domesticus with banana, tea, cocoa powder, matcha, or roasted soybean flour (kinako) were prepared. Participants consumed and evaluated each flavor combination.
Participants rated five attributes—appearance, aroma, taste, texture, and overall impression—using a 5-point scale (5: very favorable to 1: not favorable at all). Scores were totaled, with a possible range of 55–275 points.

RESULTS
(1) Across all insects types, cakes with 10g of insects received higher scores than those with 20g. Notably, the score difference for in score the yellow-vented hornest larvae was smaller (236 points for 10g and 212points for 20g).
(2) Among the flavor combinations, black tea received highest score (227 points), followed by cocoa (218 points), matcha (209 points), no flavor additive (192 points), and kinako (176 points).

CONCLUSIONS
Higher quantities of insects in cakes intensified their distinct flavor, negatively affecting palatability. Arthropods, in particular, tend to evoke aversion due to their appearance, aroma, and texture, making it advisable to use powdered forms in small amounts advisable. Regarding Pairing with other ingredients, those that conceal insects' appearance and aroma with strong colors or fragrances achieved higher evaluations.
Overall, RESULTS indicate a preference for cakes where the presence of insects was less noticeable. This suggests that greater efforts and time will be needed to increase the acceptance of insect-based foods.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_026

TRADE-OFFS BETWEEN INCREASING ORGANIC FOOD CONSUMPTION AND REDUCING LAND OCCUPATION

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BACKGROUND AND OBJECTIVES

Organic agriculture typically requires greater land area than conventional agriculture to produce the same food quantity. This study aimed to identify trade-offs between agricultural land occupation (LO) and the share of organic food in the diet (%Org) using data from a large cohort.

METHODS

A diet modelling was conducted for five dietary patterns (high-, medium-, and low-meat eaters, pesco-vegetarians, and vegetarians) under nutritional and acceptability constraints. After searching for the minimal dietary changes required to ensure nutritional adequacy, a compromise modelling approach was used to assess the potential to minimise LO or maximise %Org while exploring intermediate trade-off scenarios that progressively prioritised LO reduction over %Org increase.

RESULTS

Achieving nutritional adequacy with minimal changes led to increased energy intake and LO across all groups, particularly among vegetarians. Under nutritional adequacy, LO (m2/d) was reducible from 15.1 to 6.5 in high meat-eaters, from 8.2 to 5.2 in medium meat-eaters, and from 5.5 to 4.2 in low meat-eaters, while it had to increase from 4.3 to 4.4 in pesco-vegetarians and from 4.2 to 6.6 in vegetarians. In scenarios giving full prioritisation to LO, consumption patterns were greatly changed; meat (beef, pork and poultry) was thus considerably reduced compared to the observed situation in high and medium meat-eaters: up to 5 and 4, respectively, while meat disappeared in low meat-eaters. In trade-off scenarios, progressively prioritising LO reduction over %Org maximisation under nutritional adequacy, LO could initially decrease without compromising maximal %Org, with LO reductions ranging from ~20% (18% to 25%) in vegetarians to ~50% (41% to 59%) in meat-eaters. Further LO reduction required %Org degradation; this conflicting phase, consistent across all dietary patterns, allowed an additional ~20% (13% to 21%) LO reduction at the cost of %Org minimisation.

CONCLUSIONS

In conclusion, while nutritional adequacy and organic consumption may limit to a certain extent LO reduction, important opportunities remain, especially among meat consumers.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_027

PRACTICING PLANET-FRIENDLY SCHOOL MEALS: A CASE STUDY OF JAPANESE SCHOOL LUNCH PROGRAM

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BACKGROUND AND OBJECTIVES

Investment in nutrition is not only necessary for the first 1000 days of life, but also for the first 8000 days, which include the following 7000 days. In low- and middle-income countries, the provision of regular school meals is effective for children to go to school, receive education, reduce social disparities, and receive social protection. On the other hand, in high-income countries, school meals also function as a foundation for healthy eating habits to prevent NCDs in the future. Furthermore in Japan, recent school meals are playing a role in creating local economies and mitigating climate change, going beyond the health, nutrition and education of children, and this is called the “Planet-friendly school meal”. Here, a question about how can we realize a school meal that achieves a win-win situation for children's health and the planet's health, has rised. However, until now, there has no evaluation of the Planet-friendliness of Japanese school meals.

METHODS

Interviews were conducted with local government, nutrition professionals, cooks, schools, farmers and children, using the Planet-friendly school meals conceptual framework as an example of the school lunch program being implemented in Fukuroi City, Shizuoka Prefecture, Japan.

RESULTS

In Fukuroi City, Shizuoka Prefecture, the local government's leadership in promoting Planet-friendly school meals was a key leverage. The local government's policy was to actively purchase a certain amount of vegetables from local farmers. As a result, from 2017 to 2023, local vegetables were served in school lunches from only 14 days in a year to every day. In addition, the amount of salt was reduced, and the deliciousness was achieved in the menu and cooking process, so the amount of leftover food did not increase. By using the amount of leftover food as an important indicator for monitoring and giving the RESULTS back to community involved, it was possible to encourage to participate to the planet-friendly school meals.

CONCLUSIONS

In order to realize planet-friendly school meals, in addition to the local government leadership, delicious menus and cooking, and participation of local farmers, it is also vital to utilize the data.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_028

CHANGES IN FOOD CONSUMPTION IN POLAND AND THE EU FROM THE PERSPECTIVE OF SUSTAINABLE DIET RECOMMENDATIONS

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BACKGROUND AND OBJECTIVES
Unsustainable consumer choices may result in – among others – excessive food and water consumption, increased greenhouse gas emissions, land degradation, and waste. High levels of meat supply have the most adverse effect on the environment, followed by milk products and eggs. Therefore, one of the core principles of healthier and more sustainable diets is to moderate the consumption of animal products and replace them with plant-derived foods. The study aimed to evaluate changes in annual food consumption levels of eight selected food groups, which are markers of sustainable diets: vegetables, fruits, pulses, cereals, starchy roots, meat, eggs, and milk products.

METHODS
The data used for the evaluation originate from the FAO Food Balance Sheet (FBS) database. The consumption changes of aggregated food groups were analyzed for Poland and the European Union (EU-27, excluding the United Kingdom) in the years 2010-2022.

RESULTS
Meat consumption in Poland during the analyzed period oscillated on average at 83.2 kg/capita/year, while in the UE, it decreased from almost 85.0 to 78.8 kg/capita/year. At the same time, the consumption of pulses grew from 1.8 to 3.2 kg/capita/year in Poland, while in the EU only from 2.7 to 2.9 kg/capita/year. An increase was also observed in the case of fruits and milk products. However, consumption levels were considerably higher in the EU than in Poland. Vegetable consumption fell slightly in Poland and increased in the EU. Cereals and starchy roots consumption decreased in both Poland and the UE. However, the decrease in the consumption of these food groups was higher in Poland than in the EU. In the case of eggs, a decrease was observed in Poland by more than half, while an opposite and much slower trend in the EU was noted.

CONCLUSIONS
Based on the analysis of available FBS data, it can be concluded that in 2010-2022, the directions and rates of changes in food consumption in Poland and the EU varied. Despite the much-needed increase in the consumption of pulses and fruits in Poland, their levels are low, while the consumption of animal products remains high. The observed changes, including a decrease in vegetables, cereals, and starchy roots consumption, imply that the most important recommendations of sustainable diets, namely reducing meat consumption and replacing it with other protein sources, are not being followed. Further monitoring of trends and accelerating the shift towards more sustainable consumption choices is needed, as well as the identification of factors that can boost such a transformation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_029

EXTREME PRECIPITATION INCREASES HOUSEHOLD ESCHERICHIA COLI WATER CONTAMINATION AND DIMINISHES BENEFITS OF IMPROVED WASH PRACTICES IN A COMPLEX ENVIRONMENT IN NORTHERN UGANDA

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BACKGROUND AND OBJECTIVES
Ingestion of contaminated water is a major contributor to the burden of disease, particularly in SSA, causing diarrhea, EED, and malnutrition, resulting in around 1.4 million deaths globally annually [1-3]. Environmental factors play a key role in the proliferation, fate, transport, and human ingestion of bacterial water contaminants. Previous research indicates increased water contamination and diarrheal disease after extreme precipitation, but there is little evidence from SSA [4-6]. We examined the effect of extreme precipitation on household water contamination and interaction with WASH practices in Uganda.

METHODS
We combined household water *E. coli* and survey data from three timepoints, March-April 2021 (n=358), July-Dec. 2021 (n=334), and Aug.-Dec. 2022 (n=281), of a longitudinal cRCT in northern Uganda with daily precipitation and temperature from the ERA5 Reanalysis (0.25°x0.25°) [7,8]. We computed extremes as daily precipitation above the 80th, 90th, and 95th percentiles from 2018 to 2023 for each household location. We calculated household WASH scores (0-13) with 13 binary WASH variables including defecation and handwashing practices. We used generalized linear mixed models with quasi-Poisson distributions and log link functions to estimate the effect of precipitation extremes on same-day *E. coli* (CFU/100mL) and interaction with WASH score. Models were adjusted for intervention assignment, daily mean temperature, timepoint, and robust SEs were calculated using random intercepts for household and sampling cluster.

RESULTS
Daily precipitation above the 90th and 95th percentile was significantly associated with two times (IRR=2.16; p<0.001) and three times (IRR=3.30; p<0.001) increased concentration of *E. coli* (CFU/100mL) in household drinking water, respectively. Precipitation above the 80th percentile was not significantly associated with increased water contamination (IRR=0.85; p=0.294). Higher WASH score was associated with significantly lower *E. coli* for households with daily precipitation below the 90th percentile but not above.

CONCLUSIONS
We show precipitation extremes may result in increased water contamination in complex environments in SSA with persistent multi-dimensional poverty. Precipitation extremes may also diminish the protection from WASH practices. Future research should focus on how WASH development can change to improve community adaptation to climate extremes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_031

AN EXAMINATION OF SUSTAINABILITY MESSAGING WITHIN EUROPEAN FOOD-BASED DIETARY GUIDELINES

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BACKGROUND AND OBJECTIVES
Transitioning to healthier and more sustainable diets can help reduce the environmental impact of food systems and current dietary patterns alongside promoting population health (1). In this context, food-based dietary guidelines (FBDGs) represent an opportunity to provide sustainable dietary recommendations for populations (2). This research assessed the occurrence of sustainability messaging in European FBDGs based on criteria from the Food and Agriculture Organisation (FAO) and World Health Organisation's "Sustainable Healthy Diets Guiding Principles" and the British Dietetic Association's (BDA) "Sustainable Diet Recommendations".

METHODS
The FAO's online repository was used to access FDBGs. Three types of FBDG documents were reviewed; consumer, health care professionals, and background documents. Sustainability messaging was considered direct when criteria were included with explicit mention of sustainability, and indirect when specific criteria were included but did not mention sustainability.

RESULTS
Consumer FBDGs published after 2014 included more sustainability messaging, with Northern Europe showing the highest rate of inclusion and Southeast Europe the lowest. Consumer FDBG documents had the lowest incorporation of criteria with explicit reference to sustainability while background documents showed the highest. Overall, the inclusion of direct sustainability messaging was low in FBDGs, however, implicit sustainability mentions suggest that adhering to current guidelines may indirectly have environmental benefits alongside health improvement.

CONCLUSIONS
These findings highlight the potential to revise FBDGs to provide both nutritional and environmental messages, to support consumers in healthy and sustainable food choices (3).

CONFLICTS OF INTERESTS
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EPO2_032

MULTI-SECTORAL INTERVENTIONS WITH BENEFITS FOR CLIMATE CHANGE AND NUTRITION: A SYSTEMATIC REVIEW OF THE EVIDENCE

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BACKGROUND AND OBJECTIVES
Food insecurity, malnutrition and climate change are intertwined existential threats. There are many options for intervention that can improve food security and nutrition or buffer against climate change (or both) but prioritising these actions across global settings presents a quagmire. Despite growing literature in the food system-nutrition-climate nexus, the strength of empirical evidence from interventions is unclear, even from recent reviews. As such, we summarized the evidence on multi-sectoral interventions with potential benefits for climate change adaptation or mitigation and nutrition.

METHODS
We conducted a systematic literature review of multisectoral interventions across food systems, social protection systems, water, sanitation and hygiene (WASH), health systems, and other systems (e.g.: education, financial) to coalesce their effects on climate change (through climate mitigation or adaptation) and nutrition (including food security, diets, all forms of malnutrition, and diet-related non-communicable diseases). We also considered the various contexts in which these interventions were implemented, and how interventions contribute to or pose potential trade-offs for gender equality and women's empowerment. The review was registered in PROSPERO (ID: CRD42024588770).

RESULTS
Five academic databases and 23 organizational websites were systematically searched, resulting in 14,576 peer-reviewed records and 165 grey literature records published on or after 2000 after duplicates were removed. From these, we preliminarily identified 2,661 potentially eligible full-text records for further screening (currently ongoing). Data extraction will capture study characteristics (including study design, population, study location, intervention type, study outcomes), and quantified estimates on climate- and nutrition-related outcomes, including food security, nutrition outcomes, diets, and mitigation of greenhouse gas emissions. We will conduct a range of descriptive analyses of the included interventions, including summarizing quantified outcomes across key characteristics and a sub-analysis of interventions that contribute to gender equality or women's empowerment.

CONCLUSIONS
Our findings will help program and policy makers weigh the potential efficacy of various multi-sectoral interventions to support nutrition and climate resilience. They will provide clarity on the evidence behind actions towards impact, including mitigating and adaptive potential, potential to improve food security and nutrition, and co-benefits for human nutrition and climate action.

CONFLICTS OF INTERESTS
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EPO2_033

UNVEILING THE DIFFERENT ENVIRONMENTAL AND CARDIOMETABOLIC IMPACTS OF INDICES OF ADHERENCE TO THE SUSTAINABLE EAT-LANCET REFERENCE DIET: FINDINGS FROM A NATION-WIDE PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES
Diet, population health and planetary health are closely interconnected. Transitioning to sustainable diets can provide long-term benefits for both planetary and population health. The potential co-benefits of the EAT-Lancet reference diet for cardiometabolic health and sustainability in Chinese adults are unclear. We aimed to investigate the associations between indices of adherence to the EAT-Lancet reference diet, including EAT-Lancet Reference Diet score (ERD), World Index for Sustainability and Health (WISH) and Planetary Health Diet Index (PHDI), and risk of new-onset cardiometabolic diseases (CMDs), including myocardial infarction (MI), type 2 diabetes mellitus (T2DM) and stroke, and all-cause mortality and greenhouse gas (GHG) emissions, in a nation-wide prospective cohort of Chinese adults.

METHODS
Adults (N=14,652 for CMDs and 15,318 for all-cause mortality) from the China Health and Nutrition Survey (1997-2015) were included in the analysis. Dietary intake data were collected and ERD, WISH and PHDI scores were computed with established methods. Cox proportional hazard regression models were used for statistical analysis.

RESULTS
Over a mean follow-up period of 10 years, greater adherence to the EAT-Lancet reference diet, as reflected by higher WISH or PHDI scores, were inversely associated with risk of MI (Q4 vs Q1:HR=0.68 (0.48-0.96) for WISH and 0.14 (0.07-0.29) for PHDI), T2DM (Q4 vs Q1:HR=0.81 (0.67-0.96) for WISH and 0.68 (0.57-0.82) for PHDI), all-cause mortality (Q4 vs Q1:HR=0.80 (0.68-0.95) for WISH and 0.60 (0.46-0.80) for PHDI) and GHG emissions in fully adjusted models (all *P*-trend<0.05). ERD, WISH and PHDI were not significantly associated with risk of stroke.

CONCLUSIONS
Our findings supported the co-benefits of the EAT-Lancet reference diet for both cardiometabolic health and environmental sustainability, and long-term adherence to this reference diet guided by higher WISH or PHDI scores may be an effective strategy for reducing the risk and burden of CMDs and all-cause death in Chinese adults. These findings contribute new insights to the current literature highlighting the need to consider incorporating WISH or PHDI-assessed EAT-Lancet reference diet into dietary guidelines and utilized as an effective tool intended to help reduce the risk of CMDs and premature death in Chinese adults.

CONFLICTS OF INTERESTS
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EPO2_034

ADOPTION OF REGION-SPECIFIC DIETS IN CHINA CAN HELP ACHIEVE GAINS IN SUSTAINABLE HEALTHY AGING

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BACKGROUND AND OBJECTIVES
The unparalleled scale and speed of aging in China not only RESULTS in a higher burden of late-life diseases, but also leads to an increasing human demand on ecosystem. Due to an intrinsic link of diet to both aging and environmental sustainability, a health and environment-friendly diet is recognized as an indispensable approach to achieve sustainable healthy aging. In this context, we have recently developed a region-specific reference diet (RRD)[1] that is better aligned with Chinese culinary traditions, affordable, sparing of natural and environmental resources, and contributes to health. However, its potential in achieving sustainable healthy aging and reducing regional and gender disparities remains unknown.

METHODS
The alignment of RRD with nutritional adequacy for the elderly and economic affordability were first assessed. Then, the improvement in sustainable healthy aging, characterized by healthy life expectancy (HLE) and ecological quality index (EQI), was quantified by counterfactual analysis. Moreover, the potential of RRD in narrowing the gaps across regions with various socioeconomic status and between genders were assessed by the increase in the share of life expectancy (LE) free of disease of total LE (HLE/LE) and reduction in unhealthy LE.

RESULTS
The adherence to RRD ranged from 52.20 to 78.02% across China, and was able to fulfil the elderly daily nutrients demand. The average cost of RRD for different food groups varied from 4 to 7% of daily household income per capita, which was well affordable for the vast majority. Moreover, adoption of RRD was projected to extend HLE by 0.16 years and increase EQI by 5.16% by 2030. No matter following the upper, mean, or lower boundary of the recommended intakes of RRD, it was sufficient achieve the targets on greenhouse gas emissions, freshwater use, land occupation, and eutrophying and acidifying emissions across China. Furthermore, the discrepancy attribute to socioeconomic status in HLE, HLE/LE, and unhealthy LE could be reduced by 11.29%, 7.32%, and 4.41%, respectively when RRD was fully adopted. Similarly, the projected gender gap in HLE fell from 5.60 years to 4.65 years, the HLE/LE dropped by 3.32%, and the gap in unhealthy LE narrowed by 2.43%.

CONCLUSIONS
Given the overarching connections between aging and sustainability, RRD offers a viable solution for sustainable healthy aging. We believe that the framework of RRD would also serve as a valuable reference for other developing countries undergoing similar population aging and grappling with environmental challenges.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_035

TRENDS IN SUSTAINABLE DIETARY PATTERNS AMONG US ADULTS, 2007-2018

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BACKGROUND AND OBJECTIVES
A transition to healthy diets within a sustainable food system is essential to improve both human and planetary health. In this study, we characterized trends in sustainable dietary patterns among US adults, quantified using the Sustainable Diet Index for US adults (SDI-US), and examined changes over time in its sub-index components: diet quality, diet-related environmental impacts, food expenditures, and food practices.

METHODS
This study used data from the National Health and Nutrition Examination Survey 2007–2018 (n = 25,543 aged 20 years and older). The SDI-US (range: 4–20 points) comprised four sub-indices representing nutritional, environmental, economic, and sociocultural dimensions and was calculated using 24-hour dietary recall data and responses from consumer and dietary behavior questionnaires. A higher SDI-US score indicates greater adherence to sustainable diets. Mean SDI-US and six diet-related environmental impacts, food expenditures, and food practices across survey cycle were estimated, and statistical significance of linear and quadratic trends were examined using orthogonal polynomial contrasts in regression models. Interactions between survey cycle and demographic factors were tested. All analyses accounted for the complex survey design.

RESULTS
Overall, there were no significant trends in total SDI-US score between 2007 and 2018 (overall mean SDI-US = 13.1). While nutritional and sociocultural indicators showed little change over time, the economic indicator (food expenditures) worsened (21.4% to 26.4%, $p<.05$ linear trend) between 2007-2008 and 2017-201. Environmental impacts initially worsened between 2007-2008 and 2013-2014 but showed improvement through 2017-2018 (all $p <.05$ quadratic trend). Despite a significant interaction between survey cycle and age, there were no substantial differences in SDI-US trends by age group.

CONCLUSIONS
From 2007 to 2018, total SDI-US largely remained unchanged, whereas there was a decline over time among adults ≥60 years old. Continued monitoring and integrated improvements across all dimensions are needed to achieving sustainable diets, especially for older adults.

CONFLICTS OF INTERESTS
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EPO2_037

SUSTAINABILITY AND NUTRITION IN BRAZIL: INSIGHTS FROM THE REVISED MULTIDIMENSIONAL INDEX FOR SUSTAINABLE FOOD SYSTEMS [MISFS-R]

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BACKGROUND AND OBJECTIVES
The global syndemic, defined by the interconnected pandemics of obesity, undernutrition, and climate change, underscores the urgent need for a comprehensive evaluation of food systems and their impacts on health. Brazil faces ongoing challenges in food systems sustainability and equity. This study proposed a longitudinal analysis of the Brazilian Multidimensional Index for Sustainable Food Systems Revised [MISFS-R] to assess changes in food systems and their implications. Evaluating the evolution of the MISFS-R indicators across two time points will help identify changes and patterns, providing a robust foundation for developing context-specific strategies to protect planetary health and advancing the transformation of food systems toward sustainability.

METHODS
A longitudinal analysis of the MISFS-R indicators was conducted through paired mean comparisons between the periods 2006–2009 and 2017–2021, using Brazil's 26 states as analytical units, with statistical significance set at $p<0.05$. Data were retrieved from online platforms of government agencies and analyzed using Stata SE® 17.0 software.

RESULTS
The longitudinal analysis of MISFS-R indicators revealed stable agricultural productivity over the last decade ($p=0.36$), with increased profitability ($p=0.04$) and reduced land use ($p=0.01$). Environmental impacts, including deforestation, greenhouse gas emissions, and reduced crop biodiversity, have worsened ($p=0.00$, 0.02 and 0.01, respectively), reflecting the environmental impact related to a commodity-focused export model. Despite the stable agricultural productivity, the food production system was insufficient to ensure food availability, shown by the rise in acute thinness prevalence ($p=0.01$), which highlights social vulnerability and undernutrition, contrasting with progress in reducing nutritional deficiencies ($p<0.001$) and intestinal infections ($p<0.001$) in the Brazilian population, as well as a decline in child stunting ($p<0.001$).

CONCLUSIONS
The global syndemic demands profound transformation of food systems in Brazil. While agricultural productivity has remained stable over the past decade, environmental impacts have increased, and significant challenges to achieving food and nutrition security persist. These findings highlight the critical role of food system measurement tools, such as the MISFS-R, in identifying vulnerabilities and guiding context-specific strategies to address these complex challenges, ensuring long-term food security, environmental sustainability, and population health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_038

COMPARISON OF EAT-LANCET BASED INDICES FOR ASSESSING DIETARY HEALTH AND SUSTAINABILITY: FINDINGS FROM THE FRENCH NATIONAL INCA3 SURVEY

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BACKGROUND AND OBJECTIVES
Measuring adherence to EAT-Lancet recommendations for healthy and sustainable diets is challenging, leading to diverse methods and a lack of consensus on standardized metrics (1,2). Available indices vary mainly in scoring systems, food components, units, energy adjustments, and thresholds (2). The aim was to evaluate and compare the measurement performance of six dietary indices for assessing adherence to EAT-Lancet reference diet.

METHODS
Food consumption data of 1,723 adults were obtained from the Third French Individual and National Food Consumption Survey (INCA3) (3). The six indices studied were: World Index for Sustainability and Health (WISH), Planetary Health Diet Index (PHDI), EAT-Lancet Diet Index (ELDI), EAT-Lancet Index (ELI), Healthy and Sustainable Diet Index (HSDI), and EAT-Lancet Diet Score (ELDS). The validity and reliability of these indices were assessed following standardized statistical procedures (4), using sociodemographic data, nutritional measures (nutrient adequacy and diet quality), and environmental data (14 indicators of environmental pressure), with a statistical significance level of 0.05.

RESULTS
The analysis revealed that the four indices assessing food components with quantitative scoring (WISH, PHDI, ELDI, ELI) captured dietary variability, were less dependent on energy intake and converged to a large extent with nutritional indicators. While the two indices based on binary scoring systems (HSDI, ELDS) showed a stronger correlation with environmental indicators, one quantitative index (ELDI) converged with both domains. Indices had valid unidimensional structures supporting the use of total scores. Also, indices differed between sociodemographic groups, demonstrating concurrent-criterion validity. Higher scores were associated with higher nutritional quality and lower environmental impact, but with unfavorable RESULTS for zinc intake, vitamin B12 and water use. A low concordance rate (from 32% to 43%) indicated that indices categorized individuals differently.

CONCLUSIONS
Researchers should select indices that align with their study objectives, considering the indices' applicability and assumptions. Quantitative indices provide a detailed view of dietary health and sustainability, useful for clinical and epidemiological research, while binary indices offer a simplified approach, ideal for surveys and public health/environmental evaluations. Understanding the strengths and limitations of each type of index is essential for a thorough evaluation of dietary impacts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_039

ASSESSING SUSTAINABLE AND HEALTHY DIETS IN LARGE-SCALE SURVEYS: DEVELOPMENT OF A DIETARY INDEX BASED ON A BRIEF FOOD GROUP PROPENSITY QUESTIONNAIRE REPRESENTING THE EAT-LANCET PLANETARY HEALTH DIET

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BACKGROUND AND OBJECTIVES
Ensuring healthy diets within planetary boundaries is essential (1). However, current instruments measuring adherence to the EAT-Lancet planetary health diet are unsuitable for large-scale surveys. Simplified tools assessing consumption frequency can improve response rates, lower costs, and facilitate administration (2). Thus, this study aimed to develop a practical brief tool for evaluating EAT-Lancet diet adherence across large-scale multi-country surveys

METHODS
Initially, the EAT-Lancet Consumption Frequency Index (ELFI) was developed using a brief food propensity questionnaire of 14 food groups representing the planetary health diet from the FEAST survey, which encompassed 27 European countries (n = 27,417) (3). Subsequently, ELFI was further validated utilizing data from the INCA3 survey (n = 1,645) (4). The index was then validated against 24-hour dietary recalls by correlating it with the established EAT-Lancet Index (ELI), as well as with measures of nutritional health (nutrient adequacy and diet quality) and environmental impact. The analyses, following standardized procedures (5), included tests for reliability, structural validity, concurrent validity, and nomological validity.

RESULTS
ELFI showed strong reliability (alpha > 0.80) and factor analysis revealed a two-factor solution: “foods to encourage” and “foods to balance and to limit”. All models in confirmatory factor analysis demonstrated adequate fit. ELFI concurrent validity was confirmed as it was associated with sex, age, education, income, household size, physical activity/sedentary behavior and smoking habit (all $p < 0.05$). ELFI correlated with ELI (0.44, $p < 0.0001$) and 24-hour recall data. As for nomological validity, ELFI subscores were associated with better nutritional health ($\beta = 0.62$ and 0.23, $p < 0.0001$) and lower environmental impact ($\beta = -0.16$ and -0.36, $p < 0.0001$).

CONCLUSIONS
Overall, the ELFI approach provides a robust and easy-to-use tool for assessing adherence to planetary health diet in large-scale multi-country studies, offering valuable support for understanding dietary patterns within sustainability and health research.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_040

ASSOCIATIONS BETWEEN KNOWLEDGE, ATTITUDES, BEHAVIOURS AND HEALTHY AND SUSTAINABLE DIET QUALITY IN YOUNG AUSTRALIAN ADULTS: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
The rising prevalence of chronic diseases worldwide and the exacerbation of environmental degradation highlights the urgent need to promote healthy and sustainable diets.[1] Young Australian adults may be a pivotal group for encouraging these diets, as despite having poor diet quality,[2] they are strongly committed to climate action.[3] Before designing targeted nutrition programs to improve diet quality, it is vital to understand the determinants of their diet. Therefore, this study aimed to investigate factors associated with adherence to a healthy and sustainable diet in young Australian adults.

METHODS
This cross-sectional study required young Australian adults (n=107; aged 18-25 years) to complete an online survey and up to four 24-h diet recalls. Survey questions assessed nutrition and planetary health knowledge; attitudes, self-efficacy, food motives; and food behaviours. Diet recalls were collected via the Australian Automated Self-Administered 24-Hour Dietary Assessment tool. The World Index for Sustainability and Health (WISH) was used to assess adherence to healthy and environmentally sustainable diets. Associations between WISH score and nutrition and planetary health knowledge, attitudes, and behaviours were assessed using linear regression.

RESULTS
Individuals who reported following a plant-based diet (n=36, 34%) had higher WISH score (p=0.003). Higher knowledge of healthy and sustainable diets (p=0.01) and favourable attitudes of these diets being beneficial for the environment (p=0.003), ‘tasty’ (p=0.02), ‘affordable’ (p=0.02) and ‘easy to follow’ (p=0.006) were positively associated with WISH score. Confidence in substituting meat (p=0.002) and in achieving protein requirements through plant-based alternatives (p=0.0003) were also positively associated. Participants with higher WISH score thought that understanding the environmental benefits (p=0.048) and animal welfare concerns (p=0.004) would encourage them towards these diets. On the other hand, participants with higher adherence were less likely to consider these diets as having a positive impact to their own health (p=0.04). Participants with stronger health (p=0.004) and ethical (p=0.04) motives to food choice had a higher WISH score. Preference for meat consumption (p<0.0001) and the perception that 'meat and dairy are essential for health' (p=0.004) were associated with lower WISH score.

CONCLUSIONS
RESULTS from the study indicate that planetary health diet knowledge, attitudes and behaviours should be accounted for when designing nutrition programs for young adults.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_041

THE ROLE OF FOOD CONSUMPTION IN THE GLOBAL SYNDEMIC: A CONCEPTUAL MODEL

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BACKGROUND AND OBJECTIVES

Food systems are networks involved in food production, processing, distribution, consumption, and disposal, interacting with other subsystems. These systems drive the global syndemic, a major 21st-century challenge, marked by obesity, undernutrition, and climate change. Key factors include agriculture, urbanization, and eating behavior. While progress has been made, the impact of food consumption on the three syndemic pillars remains unclear. The objective is to develop a conceptual model to evaluate these relationships.

METHODS

A literature review was conducted to identify variables and relationships between food consumption and the syndemic. Based on a scoping review, an initial model was developed and then underwent refinement through a collaborative effort involving the research team which included a two-hour online meeting where the preliminary model, outlining the causes and consequences of the global syndemic related to food consumption.

RESULTS

The conceptual model illustrates the complexity of interactions between food consumption and the global syndemic, grouping 23 factors into five dimensions: individual, household, individual/household (I/H), city, and environment. The individual dimension focuses on eating behavior and health issues, while the household dimension emphasizes food security and access, influenced by financial stability. The I/H dimension highlights geographic accessibility and infrastructure, noting the impact of road proximity on food availability. Environmental and city factors address climate change, infrastructure, greenhouse gas emissions, and agricultural practices. The model also emphasizes food groups, offering a holistic view of interconnected factors impacting food consumption, climate change, and health.

CONCLUSIONS

The conceptual model highlights the complex interrelationships between food consumption and key components of the global syndemic, such as obesity, undernutrition, and climate change. It underscores the need for integrated public policies that promote healthy, minimally processed diets with a low carbon footprint, addressing both individual factors and broader contexts like urbanization and agricultural practices to ensure sustainability and equity.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_042

MANDALA PROGRAM: BRINGING NUTRITION BACK TO THE PLATE WITH LOCAL FOODS TO PREVENT MALNUTRITION IN INDONESIA

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BACKGROUND AND OBJECTIVES

Approximately 40% of Indonesian children did not consume the minimal amount of food diversity. As a part of Matching Fund Patriot Pangan, MANDALA program aimed to bring nutrition back to the plate with locally grown food to prevent malnutrition in the community. This initiative also seeked to improve food diversification in the community. By increasing food diversity in households and communities, this program was expected to help reduce the risk of stunting and improve the quality of human resources in Indonesia.

METHODS

This initiative was implemented in 2022. This program employed three strategies to achieve its goals: (1) initiating a network of universities as government partners through "a nutrition-sensitive value chain-based program," (2) enlisting the media and business actors through "diversity from field to plate" activities, and (3) empowering the community through "bringing back nutrition into my plate" initiatives. Those strategies were developed into several activities aimed at universities, community, government, business actors, and media.

RESULTS

This program initiated a commitment from five universities as government partners to enhance food security, involving 51 undergraduate nutrition students in developing local food-based menu innovations. The universities, in collaboration with the government and other stakholders, held a virtual food fair to promote local food-based products. Community-focused activities involved training in preparing local infant and young child foods to prevent malnutrition. Additionally, the program empowered women in collective land use for community gardens and liquid natural fertilizer production, with support through seed distribution and fertilizer-making media.The program produced three modules and three videos as educational media to enhance community knowledge. At the program's end, a virtual meeting succeeded in gathering 273 participants, including students, academics, government and non-government institutions, media, business actors, and the general public, to promote local food diversity.

CONCLUSIONS

By engaging various stakeholders, the program supported the use of locally grown foods, enhanced community nutrition knowledge, and empowered households to adopt diverse and nutrient-rich diets. It can help in improving community health and nutritional status, as well as promoting sustainable diet behavior.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_045

EFFECTS OF A “HEALTHY SETTING APPROACH” IN THE REMOTE AREA OF SOLOMON ISLANDS WITH LIMITED MEDICAL RESOURCES AND AFFECTED BY CLIMATE CHANGE

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BACKGROUND AND OBJECTIVES
In remote islands in Solomon Islands with limited healthcare resources, people often only receive treatment after they have become seriously ill, and there are many premature deaths, so there is an urgent need for a locally based strategy that emphasizes prevention. However, villages are located along the coast of the islands, but because of climate change, the frequency of storm surges has increased, and vegetables cannot be grown due to salt damage, so the balance of diet is poor. JICA supported the government on promoting "healthy setting approach (WHO)", and by strengthening the capabilities of village health promoters (VHP), it provided technical support for kitchen gardens, and promoted vegetable cultivation. Thus, the purpose of this study is to investigate whether "healthy setting approach" has impact on the eating habits of community people (adults and children) in regions that are vulnerable to climate change and have limited access to medical services, in Solomon Islands.

METHODS
Questionnaire surveys (health behavior, anthropometry, blood pressure measurement, fasting blood glucose measurement) were conducted before (2017) and after (2020) the project in a total of 15 villages in the provinces of Guadalcanal and Makira Urawa, divided into an intervention group and a non-intervention group, and a before-and-after comparison was made. Data were analyzed by a difference-in-differences test using the statistical software STATA.

RESULTS
We received responses from 383 people in the baseline survey and 422 people in the endline survey. As a result, villagers in the intervention group significantly reduced blood glucose levels (p<0.1), augmented fresh fruit intake (p<0.01), and improved knowledge and attitude related to NCDs (p<0.05), compared to those in the control group. In addition, changes were seen in children's diets, assuming through the health education to adults (parents). In particular, the frequency of intake of yellow and green vegetables both increased significantly.

CONCLUSIONS
The "healthy settings approach" may be utilized as a tool to enhance healthy diet practices of both adults and children, in resource-limited islandy contexts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_046

FATTY ACID COMPOSITION AND NUTRITIONAL INDICES OF LIPIDS IN FOODS OF ANIMAL AND PLANT ORIGIN

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BACKGROUND AND OBJECTIVES
Nowadays, diets based on plant-based foods are gaining in popularity. The consumption of whole foods derived from plants has been demonstrated to exert beneficial effects on human health. The food industry has developed a range of alternative products that differ considerably from a whole-food, plant-based diet in terms of their composition and degree of processing. The objective of this study was to conduct a comparative analysis of the fatty acid composition and fatty acid-based nutritional quality indices of ground beef-based foods and their fully plant-based alternatives produced by different manufacturers.

METHODS
A total of twelve different products were investigated, comprising six plant-based and four beef hamburger patties, as well as one plant-based and one beef minced meat product. Each product was tested with three different expiry dates. Following homogenisation, the lipids were extracted and quantified by gravimetry. The fatty acid composition was determined by gas chromatography. Additionally, the essential fatty acid index, n-3/n-6 polyunsaturated fatty acid ratio, unsaturation index (UI), atherogenicity index (AI), thrombogenicity index (TI), and hypocholesterolemic/hypercholesterolemic ratio (HHR) were also calculated.

RESULTS
Based on both label information and gravimetry measurement, significant differences ($p<0.01$) were found in the fat content of plant-based and animal-based products (animal-based: 19.67% [16.16%; 26.68%], plant-based: 10.25% [8.60%; 14.87%], median [Q1; Q3]). Except for one product, the plant-based alternatives had higher UI and HHR (UI: 129.62 [96.84; 146.10]; HHR: 50.13 [45.69; 54.14]) than animal-based hamburger patties (UI: 8.18 [3.13; 11.59]; HHR: 1.35 [1.23; 1.43]). By contrast, plant-based alternatives had lower AI and TI (AI: 0.13 [0.09; 0.58]; TI: 0.26 [0.20; 0.32]) compared to animal-based products (AI: 0.83 [0.77; 0.94]; TI: 1.87 [1.72; 2.17]). Significantly different fatty acid composition profiles were found between the investigated product groups and within a given group for both animal- and plant-based product groups.

CONCLUSIONS
According to our RESULTS, today's popular plant-based meat alternatives have significantly different and variable fat content and fatty acid composition, resulting in differences in nutritional value. To provide a more accurate and comprehensive picture, further analytical and clinical studies are needed to investigate the long-term health effects of the foods included in the study.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_047

HARMONIZING NIGERIA'S SECTORAL NUTRITION POLICIES: THE STRATEGIC ROLE OF THE NATIONAL COUNCIL ON NUTRITION

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BACKGROUND AND OBJECTIVES

Effective multisectoral coordination is essential for addressing malnutrition in Nigeria, a country with diverse socio-economic and regional disparities. The National Council on Nutrition (NCN) plays a significant role in harmonizing sectoral nutrition policies to achieve cohesive and impactful national nutrition programs. This study aims to evaluate the NCN's contribution to harmonizing nutrition policies and identify opportunities for enhancing its effectiveness in fostering integrated nutrition strategies.

METHODS

A qualitative analysis was conducted, involving a review of sectoral nutrition policies and strategies, the National Policy on Food and Nutrition, National Multisectoral Plan of Action for Food and Nutrition, and reports from NCN meetings between 2018 and 2023. Key reports from various ministries, departments, and agencies (MDAs) participating in NCN activities were reviewed. Data were analyzed to assess the alignment of sectoral policies and the mechanisms employed by the NCN to ensure coherence and collaboration among stakeholders.

RESULTS

Findings revealed that the NCN successfully established a unified framework for aligning sectoral nutrition objectives, fostering dialogue among MDAs, and integrating nutrition considerations into national development plans. However, challenges such as inconsistent funding, limited inter-agency accountability, and gaps in data sharing hindered the full operationalization of coordinated efforts. Opportunities for improvement include institutionalizing monitoring frameworks, enhancing capacity-building initiatives, and strengthening policy advocacy mechanisms.

CONCLUSIONS

The NCN serves as a critical platform for harmonizing sectoral nutrition policies in Nigeria. Strengthening its operations and addressing identified challenges can accelerate progress toward achieving national and global nutrition targets. This study highlights the importance of sustained commitment to multisectoral coordination for improving nutrition outcomes and advancing sustainable development in Nigeria.

CONFLICTS OF INTERESTS

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EPO2_048

LEGUMES: SUSTAINABLE FOODS THAT CAN MAKE A SIGNIFICANT CONTRIBUTION TO FOOD AND NUTRITIONAL SECURITY - THE CASE OF BENIN

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BACKGROUND AND OBJECTIVES
Legumes are particularly sustainable foods whose agronomic and nutritional benefits are widely recognized, and whose place in food systems should be promoted. However, few data exist on the consumption of legume-based foods in West Africa, and on the possible impact of the food transition on this consumption. The aim of this study was to assess the current consumption of these foods in a West African country (Benin), and their contribution to meeting the nutritional requirements of the population.

METHODS
The legume consumption was measured during a repeated cross-sectional survey, among a sample of adult population using a one-week retrospective food frequency questionnaire to estimate the contribution of legume-based dishes to the recommended nutrient intakes, based on their consumption frequency, portions sizes, and nutritional composition (determined by laboratory analysis). Thus, in 2023 and 2024, 1476 individuals in urban and rural areas of 3 regions of Benin (South, Centre, North) were interviewed, to study the impact of seasonality and agro-ecological conditions on the legume consumption.

RESULTS
Legumes are still widely consumed in Benin: respondents had eaten in average 4 different legume species in the week prior to the survey (among the 10 species listed), and 95% of Beninese people surveyed declared having consumed cowpea in the week preceding the survey, compared with 94% for peanut, 87% for African locust bean, and 84% for soybean. Few significant differences in legume consumption were observed according to gender or age, with the exception of soybean, which was less consumed by the elderly ($p<0.00001$), who are less accustomed to this relatively recently introduced species. However, an effect of the geographical gradient (South/North) and the type of area (urban/rural) on legume consumption was noted. The mean daily contribution of legume-based foods to the recommended protein intakes were 28% for cowpea, 20% for soybean, and 18% for peanut. Legume-based foods also made significant contributions to the recommended intakes of minerals and thiamine.

CONCLUSIONS
This regular and high consumption of legumes by the Beninese population should be encouraged, as it significantly contributes to the nutritional security of the population. In a context of nutritional transition, it is important to maintain this high level of consumption through awareness-raising messages conveying a positive image of these foods, and through the development of cowpea-based products adapted to people's needs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_049

TOWARDS SUSTAINABLE FOOD SYSTEMS WITHIN THE WILLIAMS TREATIES FIRST NATIONS

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BACKGROUND AND OBJECTIVES

Food security and climate change are deeply connected, as climate change can significantly impact food systems, particularly for Indigenous Communities in Canada. Minwanjigewin is a collaborative project led by four partnering Communities of the Williams Treaties First Nations in Ontario, Canada: the Chippewas of Beausoleil, Rama, and Georgina Island First Nations, and the Mississaugas of Curve Lake First Nation. It is a community-based project that aims to strengthen the capacity for Community-led initiatives on food security and food sovereignty, including considerations for building climate-resilient food systems. The objectives are to describe a process of community-led food system planning to enhance food security and food sovereignty in partnering communities.

METHODS

Grounded in Community-based participation, the project will identify and expand on community-assessed strengths to inform and establish an Indigenous-led Community-based food project. Georgina Island First Nation community members completed a collaboratively developed strengths-based survey with the support of community food liaisons. Completion of the survey is underway in Rama and Curve Lake First Nations.

RESULTS

In Georgina Island, approximately 40 households completed the survey. A range of community strengths was identified and mapped, including key food system actors (e.g., producers, farmers, hunters, fisherme, cooks, champions); existing programs (e.g., food boxes, community garden); and physical resources (e.g., community freezer, infrastructure). Community projects of interest and recommended actions were identified within three areas: (1) improving access to affordable food, (2) strengthening connections to land and traditional food acquisition practices; and (3) supporting locally grown food in the community. As this project is ongoing, a cross-community analysis will unfold next year, with initial RESULTS expected by Spring 2025.

CONCLUSIONS

By integrating traditional Anishinaabe culture, ecological, and more recent Western agri-food techniques, the research will foster awareness and uptake of environmentally sustainable modes of food production to support future actions. By developing community-based approaches to managing food systems that affirm Indigenous autonomy, we can foster greater food security and build more climate-resilient food systems.

CONFLICTS OF INTERESTS

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EPO2_050

WHAT INFLUENCES THE IMPLEMENTATION OF SUSTAINABLE DIETARY BEHAVIORS IN JAPANESE AND GERMAN ADULTS: A COMPREHENSIVE CROSS-CULTURAL COMPARISON

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BACKGROUND AND OBJECTIVES
The concept of integrated sustainable dietary behavior (SDB) covers a wide range of issues, such as food choices that are healthy and/or environmentally friendly, food choices and cooking behaviors that reduce food waste, reusing plastic waste, and disposal actions that minimize water pollution. This study qualitatively describes factors that influence the implementation of SDBs and quantitatively compares the RESULTS between Japan and Germany.

METHODS
Data were obtained from online focus group interviews with 16 Japanese participants (50.0% female) and online open-ended questions involving 498 Japanese and 197 German respondents (56.6% female), conducted in 2021. Manifest content analysis was employed for qualitative data. Data from each country were initially analyzed separately and then combined after extensive researcher discussions. Qualitative data were converted into a quantitative total score reflecting category frequency. Chi-square and Fisher's exact tests were used to assess cross-cultural differences in code proportions for each main category.

RESULTS
The 2,515 codes, 32 subcategories, and 20 categories that emerged from the content analysis were divided into five categories: 1) intrapersonal, 2) interpersonal, 3) food environment, 4) government, local governments, and research institutions, and 5) other. Japanese and German participants exhibited differences in the distribution of codes related to factors affecting SDB implementation across various categories. Compared to the Germans, the Japanese participants had a higher percentage of references to the "intrapersonal" and "government, local governments, and research institutions" categories ($p < 0.001$). Japanese participants were more likely to cite psychological factors, portion size, and other factors, whereas German participants frequently referenced biology, skills of SDB, local access to sustainable food, and neighborhood characteristics.

CONCLUSIONS
The study identified cultural differences in the perceived factors for implementing SDBs, particularly in categories reflecting varying circumstances like social norms and geographical conditions between the two countries. This research offers insights into these factors and can help develop promotion strategies that account for the cultural backgrounds of target populations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_053

COMPARING THE COST AND AFFORDABILITY OF NUTRITIOUS AND SUSTAINABLE FOOD BASKETS BY ZONE OF IRAN: 2016-2019

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BACKGROUND AND OBJECTIVES
Sustainable diets are characterized by being culturally acceptable, economically fair, affordable and accessible, nutritionally sufficient, safe, healthy, and efficiently utilize human and natural resources. This study aimed to determine the difference in the cost and affordability of nutritious and sustainable food baskets in different zone of Iran in 2016-2019.

METHODS
In this repeated cross-sectional study, the expenditure and income data of128,716 Iranian households participated in the “Household Income and Expenditure Survey” during the years 2016-2019 were used. The data were categorized to 11 zone. The sustainable and nutritious food baskets were modeled using linear programming and ideal programming. The cost of the baskets was calculated by summing the average price of each food item based on the amount (gram) of each in the food basket. Affordability was estimated based on the total cost of each basket compared to the average monthly disposable income of the household. Data was analyzed using R software (version 4.3.0). One-way analysis of variance and post-hoc statistical tests were used to compare the differences between zones.

RESULTS
In all zones, the cost of a nutritious food baskets was higher than the cost of a current food basket, and the cost of a sustainable food basket was lower than the cost of the current food basket.The highest cost of current and sustainable food basket was in zone1 (93001.89and73290.27Rials,respectively) and the lowest cost of those baskets was in zone10(81484.38 and 63655.62Rials,respectively).About nutritious food basket,the highest costand the lowest cost was belonged to zone1(116277.05Rials)and zone 3(29210.98Rials), respectively.About affordability, in all food baskets, households in zone5 had the highest (74.34%,57.49%and92.12%,respectively) and households in zone8 had the lowest (24.28%,19.20% and30.00%,respectively)percentage of the income spent on food baskets.

CONCLUSIONS
The findings indicate that, overall, in all different zones of Iran, the cost of the nutritious and sustainable food basket was higher and lower than the current food basket, respectively. Regarding affordability, households in zone 5 allocated the largest percentage of their income to preparing food baskets. These findings emphasize the importance of future planning and policy implementation focused on food support, particularly in drought-affected and deprived zones. Additionally, targeted interventions could focus on enhancing the affordability of the nutritious and sustainable food basket for vulnerable populations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_054

PROMOTING SUSTAINABLE DEVELOPMENT THROUGH PLANT-BASED MEALS

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BACKGROUND AND OBJECTIVES

Taiwan Adventist Hospital has integrated food sustainability into its practices, supporting the achievement of SDGs. In 2021, the hospital launched the *My Healthy Plate—Enhancing Patient Health Literacy* program, focusing on educating patients about proper food choices and portion control through individual nutritionist consultations. The initiative encourages healthier eating habits by presenting meals in a structured, visual format, aiming to reduce food waste and improve nutritional knowledge.

METHODS

A randomized sample of 150 patients consuming regular hospital diets (non-therapeutic) was assessed. Silicone-covered utensils were used to evaluate carbon emissions and leftover food volume of plant-based meals compared to equivalent pork bento meals.

RESULTS

1. **Carbon Emissions:** Each plant-based meal resulted in 0.82 CO2eq per person, with a total of 2.46 CO2eq per day per person. The total carbon emissions for 150 participants were 369 CO2eq per day.
2. **Food Waste Reduction:** Prior to the program, daily food waste per patient was 72kg (water weight). Post-implementation, the leftover food per meal was reduced to 102g, resulting in a total daily reduction of 41.4kg of food waste for 150 participants.

CONCLUSIONS

Hospitals are ideal platforms for promoting sustainable eating practices. Low-carbon diet education contributes to the development of healthy, sustainable eating habits and aligns with SDG 13 (Climate Action). Taiwan Adventist Hospital will continue to promote green, sustainable food services for staff, patients, and the community.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_055

UTILIZATION OF EDIBLE SLAUGHTERED FISH BYPRODUCTS: A HEPATOPROTECTIVE GROUPER HEAD HYDROLYSATES

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BACKGROUND AND OBJECTIVES
Groupers' byproducts, accounting for approximately 43% of their weight (15% fish head, 6% fins, 12% middle bones, and 10% viscera), are often discarded or processed into bone meal for feed additives due to their strong odor and limited consumer acceptance, leading to ineffective utilization. Grouper head hydrolysates (GHHs), produced via Alcalase hydrolysis, are rich in aromatic amino acids, branched-chain amino acids, and taurine, known for their antioxidant and hepatoprotective properties. This study aimed to evaluate the effects of GHHs on liver fibrosis by investigating their anti-inflammatory and antioxidant activities.

METHODS
Eight-week-old male Wistar rats (n=8 per group) were randomly divided into 5 groups: (1) control (saline + distilled water); (2) model (TAA + distilled water); (3) low-dose GHHs (TAA + 50 mg kg^{-1} GHHs); (4) high-dose GHHs (TAA + 100 mg kg^{-1} GHHs); and (5) positive control (TAA + clam essence, CE). Liver fibrosis was induced by thioacetamide (TAA) injections three times weekly. After 10 weeks, body weights, serum biochemical markers, liver histopathology, antioxidant enzyme activities, and pro-inflammatory cytokine levels were assessed.

RESULTS
Supplementation with GHHs in TAA-treated rats mitigated body weight loss and significantly reduced serum markers of liver injury (AST, ALT, and ALB) ($p < 0.05$). GHHs enhanced the activities of antioxidant enzymes (SOD, CAT, and GPx) and lowered pro-inflammatory cytokine levels (IL-1β, TNF-α, and IL-6) in livers ($p < 0.05$). Histological analysis revealed reduced cell infiltration and collagen deposition in TAA-treated rats receiving GHH supplementation.

CONCLUSIONS
GHH supplementation alleviates liver fibrogenesis through anti-inflammatory and antioxidant mechanisms, with even low doses achieving the expected RESULTS. The development of GHHs not only adds value to grouper byproducts but also presents a promising approach to reducing liver dysfunction and supporting liver health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_056

ASSESSING DIET QUALITY AND CARBON FOOTPRINT: A CROSS-SECTIONAL STUDY AMONG YOUNG ADULT WOMEN

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BACKGROUND AND OBJECTIVES

Sustainable diets aim to have a low environmental impact; however, the carbon footprint of nutrient-rich animal-based foods is higher compared to plant-based foods. This study aimed to evaluate the diet quality and carbon footprint of young adult women's diets.

METHODS

This cross-sectional study included 332 women aged 18-30 years. Individuals with chronic diseases, pregnant and lactating women, as well as those with a daily energy intake of less than 500 kcal or more than 3500 kcal, were excluded from the study. Data were collected through face-to-face interviews using a questionnaire. Participants provided two-day dietary records (weekday and weekend). Carbon footprints (g CO2 emission/1000 kcal) were calculated from dietary records, and the NRF 20.3 index (per 1000 kcal) was computed. Data were analyzed using ANOVA, Tukey HSD post-hoc test, and Pearson correlation ($p<0.05$) in SPSS v.26. This study was supported by the Scientific and Technological Research Council of Turkey (TÜBİTAK) 2209-A Project (1919B012221084).

RESULTS

Of the 332 individuals participating in the study (21.51±2.04 years; 21.80±2.91 kg/m²; 78.3% with normal BMI), 62.3% were students who lived in dormitories. Carbon footprint values did not show a statistically significant difference between weekdays and weekends. Diet quality was lower on weekdays compared to weekends ($p=0.009$). A positive correlation was found between carbon footprint values and NRF 20.3 index scores ($r=0.229$, $p<0.001$). Table 1 presents the NRF 20.3 index score according to carbon footprint tertiles.

Table 1. Nutrient Rich Foods (NRF) 20.3 Index Scores by Carbon Footprint Tertiles

	Carbon footprint (gCO2e/1000 kcal)			
	Q1 (n=111)	Q2 (n=111)	Q3 (n=110)	p
	Mean±SD (95% CI)	Mean±SD (95% CI)	Mean±SD (95% CI)	
NRF 20.3 index score (per 1000 kcal)	734.9±176.55a (701.8-768.1)	771.8±196.23a,b (734.9-808.7)	818.3±192.12b (781.9-854.6)	0.005

CONCLUSIONS

As diet quality increases, the carbon footprint values of individuals also tend to rise. This relationship highlights the challenge of balancing improved nutritional outcomes with sustainability. Therefore, dietary planning should focus on strategies that reduce the environmental impact of food choices while maintaining or even enhancing diet quality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_057

DETERMINING THE ECOLOGICAL FOOTPRINT AND NUTRIENT COMPOSITION OF SOME INNOVATED DISHES

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BACKGROUND AND OBJECTIVES
Sustainable nutrition has the potential to improve both human and planetary health. Growing population and current dietary trends are not only increasing non-communicable diseases but also deepening environmental risks. The adoption of plant-based diets with low ecological impact, particularly models like the Mediterranean diet, optimizes global resource use by reducing carbon and water footprints. This study is an innovation project aimed at reducing the ecological footprint, improving the nutritional content, and examining the sensory effects of transforming traditional dishes with plant-based alternatives.

METHODS
In the study, five main dishes (mantı, içli köfte, çökertme kebabı, hünkâr beğendi, karnıyarık) and one dessert (ekmek kadayıfı) were selected, and animal-based ingredients were replaced with plant-based alternatives. The carbon and water footprints of the meals were calculated using factors derived from the literature, and their nutritional content was analyzed using the BeBiS 8.2 TAM program. Cost calculations were based on official institution and chain market data, while sensory evaluation was conducted through a panel of volunteer participants. The obtained RESULTS were compared and discussed.

RESULTS
In the innovated dishes, a reduction in carbon footprint ranging from 23.5% to 95.5%, and a reduction in water footprint ranging from 47.4% to 85.7% were observed compared to traditional recipes. The energy content generally decreased, while carbohydrate and fiber content increased in most of the main dishes. In the dessert, the use of alternatives like soy milk led to an increase in the water footprint. When analyzing the costs, the innovated main dishes showed a reduction in cost ranging from 53.5% to 75.8%, while the cost of the dessert increased by 44%. In sensory evaluations, most of the innovative dishes were well-liked by panelists, although some received lower ratings. These findings indicate positive effects on environmental sustainability and nutrition, while also leading to some changes in cost and taste.

CONCLUSIONS
Replacing animal-based foods with plant-based alternatives reduces carbon and water footprints, offering cost benefits. Research shows replacing red meat lowers ecological impacts, while dairy substitutions vary. Nutritional improvements, such as better energy, fiber, fat, and cholesterol levels, enhance health. Sensory evaluations indicate general acceptability, supporting ecological and economic sustainability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_058

CAN LOCAL AGRICULTURE IMPROVE THE NUTRITIONAL QUALITY OF DIET WHILE REDUCING THE ENVIRONMENTAL IMPACT IN GUADELOUPE ? A SYSTEM MODEL APPROACH FROM FORK TO FARM

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BACKGROUND AND OBJECTIVES
In Guadeloupe, agriculture is strongly oriented towards export crops, which limits the capacity of local production to meet domestic demand. In addition, the territory is facing urgent public health issues with increasing rates of nutrition-related chronic diseases along with a profound change in the diet structure. The aim was to assess the extent to which local agricultural production could contribute to improve the nutritional quality of diet in Guadeloupe, while limiting its impact on the environment.

METHODS
Data from a food consumption survey conducted in adults > 15 years were related to food prices, nutritional composition of food and dishes and the share of local origin of each food consumed. The mean observed diet of the general population and its cost were estimated based on these data. Diet optimization models were built using mathematical programming to assess the possibility of maximizing foods from local origin in the diet while fulfilling nutritional requirements and without increasing the observed cost. Then, a bioeconomic model (MOSAICA) was used to simulate the impact of a transition toward the optimized diet on the agricultural sector in Guadeloupe, to assess its feasability at the territory scale. Finally, an environmental assessment at the level of the Guadeloupe territory was performed using Life Cycle Assessment.

RESULTS
RESULTS showed that the share of local products can be increased up to 75% while increasing the nutritional quality of the diet and without increasing the baseline cost of 7 €/day/person. The RESULTS from the bioeconomic model showed that this transition toward a healthier and more local diet would be hampered by the lack of farm labor, lack of available land and sanitary risk due to chlordecone pollution. The main positive environmental impacts induced by such transition toward more local food in the diet would be on water eutrophication and land use due to more quantity of local yam and bovine meat.

CONCLUSIONS
Improving the nutritional quality of the diet while increasing the share of local food without increasing the observed budget in Guadeloupe is feasible. However, two conditions should be met to reach this result: a higher plant-based diet is necessary to lower the environmental impact; then, increasing the agricultural workforce and mobilizing new farmland are necessary to not destabilize existing sectors.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_059

INTEGRATING CASH ASSISTANCE AND BEHAVIORAL INTERVENTIONS TO PREVENT CHILD AND MATERNAL MALNUTRITION IN SOMALIA: INSIGHTS FROM A CLUSTER RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
Wasting is a significant public health challenge, especially in humanitarian contexts like Somalia, where children under 5 (CU5) and pregnant and lactating women (PLW) face elevated risks of morbidity and mortality. CashPlus programs, which combine cash transfers with behavioral education or other assistance, have been used to support communities in humanitarian settings for years, despite evidence gaps on which combinations and durations of assistance are most effective at reducing wasting in CU5 and PLW. Understanding the specific drivers of wasting is critical for shaping effective policies and programs.

METHODS
A cluster randomized controlled trial was conducted within Save the Children's "CashPlus for Nutrition" program in Somalia's Bay and Hiraan regions, comparing three interventions: (1) cash only, (2) cash plus social and behavior change communication (SBCC), and (3) cash plus top-up cash. A total of 33 villages were randomized (11 per study arm), targeting 1,492 households. The study evaluated the effectiveness and cost-effectiveness of each arm in reducing wasting among CU5 and PLW after three and six months. Data was also used to assess the determinants of child and maternal wasting through regression models.

RESULTS
Child wasting prevalence at baseline was 15%, which dropped to 13% (cash-only arm) and 9% (cash + SBCC arm) by midline, with no significant reduction in the cash + top-up arm. Wasting remained the same in the cash + top-up arm at 15% (12.1% - 18.6%). By endline, little change was observed from the midline. Maternal wasting decreased in all groups, but differences were not statistically significant. Dietary diversity, household conditions, and hunger levels improved across all arms, with cash + SBCC being the most effective and cost-effective intervention. Risk factors for wasting included poor waste disposal practices, open defecation, household food insecurity, and low maternal education, while protective factors were consumption of animal-based foods and having more than one CU5 in the household.

CONCLUSIONS
The combination of cash assistance and SBCC was the most effective approach for reducing child and maternal wasting, improving household food security, and reducing moderate and severe hunger. Drivers of wasting in Somalia may vary by seasonality, region, and child age. Policies should focus on empowering mothers, improving health and sanitation practices, and increasing household food security and access to nutrient-dense foods. Findings will enable more efficient and effective use of strained humanitarian assistance budgets, maximizing the reach and impact of assistance packages in Somalia and similar contexts around the world.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_060

CONSUMPTION OF ULTRA-PROCESSED FOODS AND HOME-MADE FRIED FOODS WITH SUSTAINABLE LIFESTYLES IN IBERO-AMERICAN

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BACKGROUND AND OBJECTIVES
Worldwide, consumption of ultra-processed foods has increased in recent years, and although there is much evidence that consumption of these foods is associated with increased risk of chronic diseases, there are no studies linking it with sustainable activities of daily living. The aim of this study is to associate the consumption of ultra-processed foods and home-made fried foods with sustainable activities in Ibero-America.

METHODS
An observational, analytical, multicenter study was conducted with 6,067 participants from 14 Ibero-American countries via an online survey. Consumption of ultra-processed foods and home fried foods according to a validated survey. The validated sustainable lifestyle survey is subdivided into 3 items: 15 questions assessing food and shopping; 12 questions assessing transport, recreation and self-care; and 11 questions assessing the environment. This gives a range of 50 to 185 points, the higher the score, the better the adherence to sustainable lifestyles. linear regresion models were applied, adjusted for sex, nutritional status, schooling and age.

RESULTS
The mean age of participants was 35.2 years (SD 12.7). Associations between food consumption and EVS showed that compared to no consumption, occasional consumption, 1 portion/week, 2 portions/week and ≥3 portions/week of these 3 food groups decreased the EVS score proportionally. In the case of fried foods consumption of ≥ 3 servings day (β -13.221; CI95% -15.445*;* -10.997), Fast Food (β -15.976; CI95% -20.489*;* -11.463) and sugary drinks (β -10.874; Ci95% -13.287*;* -8.460).

CONCLUSIONS
The higher consumption of ultra-processed foods and home-made fried foods is negatively associated with sustainable lifestyles

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_063

YOUNG ADULTS' STRUGGLES WITH THEIR FOOD ENVIRONMENT – A CASE STUDY USING PARTICIPATORY VIDEO MAKING IN TWO AGRO-PASTORALIST COMMUNITIES

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BACKGROUND AND OBJECTIVES

The food environment (FE) is the context in which people select, acquire, prepare, and consume food and is thus a determinant of diet quality and nutritional outcomes as people mainly consume what is within their physical and economic reach. Limited information is available about the perception of young people living in drylands often affected by food insecurity. This study invited thus young adults living in (agro-) pastoralist communities living in drylands to share their food environment perspectives.

METHODS

Eight groups (n=5) of 18-24-year-old adults ((agro-)pastoralists) were invited by the village leaders to participate voluntarily in the study. The concept of FE was introduced using 7-day dietary recalls and FE mapping. Smart-phones were lended to the adults to produce videos of their FE. The adults received basic training on videomaking and editing. The final videos were transcribed verbatim, translated and subtitled in English. Grounded theory was applied to derive theories on young people's perceptions on their FE.

RESULTS

Skipping meals, searching food in the wild, and asking for external support were strategies to combat hunger following a serious drought. There was interest to taste modern foods like pasta, but cooking methods were limited because of lack of resources to buy diverse ingredients and lack of knowledge to prepare healthy meals. Vegetable and fruit farming were considered as strategy to improve food availability. However, safe water for drinking is already scarce, leaving limited options for farming. Income generating opportunities are limited, partially because of poor schooling opportunities and lack of skills besides livestock keeping. Even if financial resources would allow to purchase food, options to buy foods were limited. Still, participants emphasized on the need for income opportunities to enable food purchases for healthy diets. Fruits, if consumed, were collected from the wild after walking long distances. Existing food aid distribution places were not presented in the young adults' videos, and food aid was seen only as a short-term solution. Participants were more interested in making their own food choices with their own resources.

CONCLUSIONS

Market, road and public transport infrastructure needs to be improved to allow supplying diverse foods to dryland areas and buying them in close proximity. The young adults concluded that vegetable farming and restoration activities to protect wild foods are important activities to sustainably improve accessibility to healthy foods and livelihoods.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_064

INVESTIGATING WEB-BASED NUTRITION EDUCATION INTERVENTIONS FOR PROMOTING SUSTAINABLE AND HEALTHY DIETS IN YOUNG ADULTS: A SYSTEMATIC LITERATURE REVIEW

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BACKGROUND AND OBJECTIVES
Our current rapidly growing food systems are imposing a heavy burden on both environmental sustainability and human health. Sustainable and healthy diets aim to promote optimal health and have a minimal environmental impact. This study aimed to critically review and synthesise the evidence on the effectiveness of web-based nutrition education interventions aiming to promote sustainable and healthy diets among young adults.

METHODS
A systematic search of four databases (Medline, PsycINFO, Scopus, and Embase) was conducted in March 2021. Studies were included if they used an online platform to deliver the intervention to young adults and measured at least one aspect of sustainable and healthy diets, such as plant-based food intake, food waste, and local and seasonal produce.

RESULTS
Of the 2991 studies, a total of 221 full-text articles were assessed for eligibility of which 22 were included in the final review. A majority of the studies (82%) targeted fruit and vegetable consumption, and close to a quarter of studies (23%) targeted other aspects of a sustainable and healthy diet, such as red meat intake. Only one study included multiple aspects of a sustainable and healthy diet. Program delivery outcomes reported overall positive feedback and engagement.

CONCLUSIONS
This review suggests that web-based interventions may be effective in promoting some sustainable diet-related outcomes in young adults. However, there is a need for developing and evaluating future programs to promote sustainable diets more comprehensively in order to help young adults make healthy and sustainable food choices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_065

ADHERENCE TO PLANETARY HEALTH DIET, ENVIRONMENTAL IMPACTS, AND HYPERTENSION RISK: A PROSPECTIVE COHORT STUDY FROM THE CHINA HEALTH AND NUTRITION SURVEY

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BACKGROUND AND OBJECTIVES
It remains unknown whether adherence to the Planetary Health Diet (PHD) protects against hypertension. Thus, we investigated the association of two PHD scores with hypertension risk and diet-related environmental impacts among Chinese adults with predominantly plant-based diets.

METHODS
We included 16,124 adults aged 18-80 years from the China Health and Nutrition Survey (1991-2015) who were free from hypertension, diabetes, cardiovascular diseases, and cancer at baseline. Dietary intake was assessed repeatedly using individual-level 3-day 24-hour dietary recalls supplemented with household-level weighing methods in each survey. The planetary health diet score (PHDS) and planetary health diet index (PHDI) were employed to evaluate adherence to PHD. Hypertension was ascertained via blood pressure measurement, previous medical diagnosis, or current use of anti-hypertensive medication.

RESULTS
During a median follow-up of 11.1 years, 5,367 participants developed hypertension. PHDI was not associated with hypertension risk (HRQuartile4 vs Quartile1=0.98; 95% CI, 0.90-1.07), whereas higher PHDS was associated with a lower risk of hypertension (HRQuartile4 vs Quartile1=0.80; 95% CI, 0.74-0.88; *P*-trend < 0.001). In contrast, higher PHDS was related to higher greenhouse gas emissions (β=0.39kg CO2 equivalent; 95% CI, 0.37 ~ 0.40 kg CO2 equivalent), water use (β=0.41m3; 95% CI, 0.38 ~ 0.43m3), and land use (β=0.42m2; 95% CI, 0.39 ~ 0.46m2), whereas higher PHDI was related to lower water use (β=-0.12m3; 95% CI, -0.15 ~ -0.09m3) and land use (β=-0.27m2; 95% CI, -0.32 ~ -0.23m2).

CONCLUSIONS
The two proportional scoring systems representing PHD exhibited differences in their construction, applicability, and association with both health and environmental outcomes. The PHDI, primarily developed for western populations, showed environmental benefits on water and land use, but was not necessarily associated with hypertension risk. In contrast, the PHDS, developed for a Chinese population residing in Singapore, was associated with a lower risk of hypertension but had higher environmental impacts. Thus, it is crucial to develop scoring systems that can accurately represent PHD within the Chinese population in future studies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_066

ATTITUDES TOWARDS FOOD WASTE AND WILLINGNESS TO PAY FOR LEFTOVERS IN SELF-SERVICE RESTAURANT

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BACKGROUND AND OBJECTIVES
SSRs (self-service restaurants) are restaurants offering lunch buffets; thus, the diner decides the amount of food taken. The freedom of choice may lead to larger portion sizes, consequently resulting in increased food waste. Attitudes, emotions, and values greatly influence food choices and eating habits. Therefore, it is necessary to understand diners' attitudes towards waste. This study aims to assess the attitudes toward food waste, food waste behavior, and motivations in terms of reducing food waste in SSR.

METHODS
The study was conducted in intelligent SSR, at the University campus area. The food waste monitoring is automated in the study's SSR by integrated scales. The study involved 157 participants, with 146 completing it. Of the participants 78% (n=115) were women, 21% (n=31) were men, and 1% (n=2) another gender. The mean age was 40.4 years (SD=12.6). Attitudes and emotions toward food waste were surveyed using questionnaires. The SSR platform enables linkage between participants' questionnaires and the waste amounts.

RESULTS
Of the participants, 67% (n=97) were aware of the impacts of food waste, 29% (n=42) were somewhat aware, and 4% (n=5) were unaware. Of the females, 97% (n=111), and 93% (n=28) of males were at least somewhat aware of food waste and its impacts (p=0.025, Exact Cochran-Armitage trend test). According to the questionnaire, 12% of participants left food (n=8) and 92% did not leave food waste in the study (n=131). Reported food wastage, in general, was linked to the study's food waste: 5% (n=6) of those participants who do not in general leave food, left food in the study, while 29% (n=6) of participants who generally leave food, left food in the study (p<0.003, Fisher's Exact test). Overall, 38% (n=54) of participants were willing to pay for leftovers. Males were more willing to pay for leftovers (67%, n=20) than females (30%, n=34) (p<0.001, Fisher's Exact test). In addition, younger participants (under 50) were more willing to pay for leftovers (44%, n=46) compared to those aged 50 and above (21%, n=8) (p=0.0184, Fisher's Exact test). Interestingly, high food waste awareness did not significantly influence willingness to pay (p=0.35, Exact Cochran-Armitage trend test).

CONCLUSIONS
Overall awareness of food waste and its impact was high in this highly educated study population. Gender impacted both awareness and attitudes toward paying for food leftovers, while age impacted paying for leftovers. The study highlights significant gender and age differences in attitudes toward food waste.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_067

WILLINGNESS TO TRY NOVEL PROTEIN POWDERS: MUNG BEAN AND MEALWORM PROTEIN

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BACKGROUND AND OBJECTIVES
Protein powders for supplementation (e.g. whey protein) have gained popularity over the last decade. The search for more sustainable alternatives has resulted in the inclusion of mung bean and mealworm protein in the European Union List of Novel Foods (Regulation (EU) 2017/2470). This study investigates willingness to try protein powders from these novel sources and interplaying factors such as food neophobia and food technology neophobia in a young adult population in the EU.

METHODS
An online survey was conducted in October 2024 in Spain and the Netherlands assessing the willingness to try mung bean and mealworm protein powder. A total of 402 participants were recruited, between the age of 18 and 40 years old. All participants reported to have previously consumed whey protein supplementation. Willingness to try is measured on a 7-point Likert scale for all proteins through the combination of through three questions: (1) interest in trying the product, (2) openness to taste the product, and (3) willingness to sample the product in a recipe or shake.

RESULTS
Protein supplementation was reported to be mostly consumed through dairy products like yoghurt and pudding with added protein (75% reported consumption at least once per month), followed by protein shakes (67%) and bars (66%). The participants reported the highest mean willingness to try for whey protein of 5.71 on a 7-point Likert scale, followed by plant (4.98) and insect (2.99). A great majority rated whey protein a 7 out of 7 (39%, 50% and 51.2% for statement 1,2, and 3 respectively). In contrast, a significant number rate insect protein with a score of 1 out of 7 (42.3%, 36.1%, and 37.8% respectively), suggesting a strong aversion or negative perception. Willingness to try mung bean protein more closely resembles a normal distribution, however the majority of consumers rated a 5 or higher out of 7 (58.9%, 68.4%, and 69.9%).

CONCLUSIONS
Mealworm protein was not readily accepted by most participants, and a great majority rated it a 1 out of 7 Likert scale, indicating a strong disinterest or aversion to the product. However, this study reveals an opportunity for mung bean protein as a form of protein supplementation in the diet of young adult protein consumers in the EU.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_069

ADHERENCE TO CHINESE PLANETARY HEALTH DIETS, ALL-CAUSE MORTALITY, AND ENVIRONMENTAL IMPACT IN THE CHINA HEALTH AND NUTRITION SURVEY

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BACKGROUND AND OBJECTIVES
The EAT-Lancet Commission launched a planet-healthy diet (PHD) to promote human health and environmental sustainability. However, the current PHD scoring systems, developed mainly in Western populations, cannot balance health and environmental benefits in the Chinese population. We aimed to develop a PHD scoring system tailored for the Chinese population and to investigate its association with all-cause mortality and environmental impact.

METHODS
We used data from the China Health and Nutrition Survey (CHNS) 1991-2015. Participants aged 18 years or older without a history of cardiovascular disease or cancer at baseline were included. Dietary intake was repeatedly assessed by individual three consecutive 24-hour dietary recalls and household food inventory weighing methods. We constructed a Chinese PHD score (range 0-140) based on the recommended consumption of 14 food components by the EAT-Lancet Commission. Death was ascertained through household surveys in each wave. Time-dependent Cox proportional hazards regression models were used to calculate multivariable-adjusted hazard ratios (HRs) and 95% confidence intervals (CIs).

RESULTS
We included 19,659 adults in the analysis. The median PHD score was 48.0 (IQR: 42.6-52.9) points. Over a median follow-up of 10.9 years, 1,615 deaths were observed. After adjustment for potential confounders, compared with participants in the lowest tertile(T) of PHD score, those in the highest tertile had a 13% lower risk of all-cause mortality (HR=0.87, 95% CI: 0.76-0.99; P-trend=0.04). The HR for each 10-point increment in PHD score was 0.91 (95% CI: 0.86-0.97). In the term of environmental impact, PHD scores were inversely associated with environmental impact, with significant differences between the lowest and highest tertiles for greenhouse gas emissions (85.0 vs. 58.9 10kgCO2), water use (6.4 vs. 6.0 $10m^3$), and land use (62.9 vs. 59.3 $10m^2$) (all *P*-trend < 0.001).

CONCLUSIONS
Better adherence to the PHD, assessed using a Chinese PHD scoring system, was associated with a reduced risk of all-cause mortality and a lower environmental burden in Chinese adults. These findings support the potential of the PHD as a tool for promoting both human health and environmental sustainability within the Chinese population.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_070

CREATING HEALTHY AND SUSTAINABLE DIETS WHILST MINIMISING CHANGE FROM CURRENT DIETS: A LINEAR PROGRAMMING APPROACH

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BACKGROUND AND OBJECTIVES

Sustainable diets can be defined as 'those with low environmental impacts, nutritionally adequate, affordable, safe and healthy, culturally acceptable and accessible' (1), but how these translate in terms of food intake is less clear. The objective of this study was to model, using data from the island of Ireland, what nutritionally adequate and sustainable diets could comprise, with modelled diets having minimal deviation from the current baseline diet to ensure acceptability.

METHODS

Linear programming was used to optimise three new population diets for two combined food surveys representing adults on the island of Ireland, providing a total cohort of 1484 adults aged 18-64y. Three scenarios were applied to baseline diets with the primary aim of maintaining acceptability. Constraints were applied in a stepwise manner. First, constraints relating to greenhouse gas emissions (GHGe) and Blue Water Use (BWU) were applied (scenario 1), followed by constraints relating to energy, 20 nutrients, Irish food based dietary guidelines (IFBDG's) and GHGe and BWU (scenario 2). In the final scenario, constraints relating to essential amino acids were added to those of scenario 2 (scenario 3).

RESULTS

In scenario 1, 100% of the cohort met the constraints, this reduced to 45% for scenarios 2 and 3. Three food groups were excluded in scenario 1 which included 'lamb and lamb dishes', 'liver and liver dishes' and 'tea, coffee and water'. In scenario 2, food groups 'lamb and lamb dishes' and 'liver and liver dishes' were excluded and four food groups were excluded in scenario 3, ' lamb and lamb dishes', 'liver and liver dishes', 'tea, coffee and water' and 'butter'. Mean daily intakes of a number of food groups that changed from the baseline diet across scenarios differed, with mean daily intakes of 2 food groups increasing in scenario 1, 16 food groups increased in 2 and in 3. When nutritional and environmental constraints were applied (scenarios 2 and 3) there is a trend whereby intake of plant based food groups increased and animal based food groups decreased in order to fulfil the constraints.

CONCLUSIONS

A nutritionally adequate and sustainable diet is possible, however, with increasing model constraints it is harder to create diets that are likely to be acceptable. This highlights the importance of balancing sustainability and nutritional adequacy with individual acceptability, highlighting a key area for future research: enhancing the acceptability of healthy and sustainable diets.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_071

REMOVAL OF BEST BEFORE END DATES AND PACKAGING REDUCTION POLICIES - UPTAKE AND IMPACT ON FRUIT AND VEGETABLE OFFERINGS: A UK RETAILER AUDIT

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BACKGROUND AND OBJECTIVES
Household food waste (HHFW) remains a global environmental and socioeconomic problem. In 2022, The Waste and Resources Action Programme (WRAP) published a report recommending the removal of best before dates (BBDs) and plastic packaging from fresh produce to reduce HHFW in the UK (1). However, the extent of adoption by UK retailers, the products included and the potential impact, including unintended consequences, on consumer behaviour, remain unclear. To understand whether these policies had the desired impact on retailers, this study aimed to audit whether BBDs and plastic packaging were being removed as stated in the WRAP guidelines, and to what extent this affected product quality.

METHODS
Data were collected prospectively over two audits at four retailers (representing a range of store types) in Guildford, UK. Four produce types (apples, broccoli, peppers, and tomatoes), chosen to reflect popularity, packaging types and availability, were audited at every retailer. Packaging type and date labelling were recorded and a quality scoring system was developed and applied to enable a visual assessment of each item across four characteristics to be conducted, with higher scores representing worse quality.

RESULTS
445 individual items were assessed over 4 stores. 91% produce had BBDs removed but only 29% were sold without plastic packaging; smaller, lower-budget retailers were less likely to sell loose produce. While peppers with BBDs had significantly higher quality than peppers without ($p=0.005$), there was no significant difference between tomatoes with and without BBD. No significant differences were found in overall quality for any produce type when comparing those with and without plastic packaging, however there was an effect of retailer type for all products except tomatoes. Total Quality Score was highest (representing poorer quality) in the smaller, lower-budget retailers.

CONCLUSIONS
Although BBD removal was successfully implemented by most retailers, no retailer met recommendations to offer at least one loose alternative for each produce (2). Smaller, lower-budget retailers appeared the least compliant with plastic removal but also the most likely to stock lower quality produce, suggesting influences on quality beyond packaging. Minor differences in visual quality were seen when loose and packaged produce were compared, suggesting minimal impact of packaging removal however further research is required to chemically investigate any differences in nutrient content.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_072

A "SUSTAINABLE AND HEALTHY FOOD TOOLKIT" FOR EARLY CHILDHOOD EDUCATION SETTINGS

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BACKGROUND AND OBJECTIVES
Early Childhood Education and Care (ECEC) settings provide food to a large number of young children. This is a complex task involving all centre staff, as centres are required to provide healthy food within budget, time and skill constraints. Practices promoting environmental sustainability are sub-optimal, for example, one study found an average of 27% (up to 64%) of prepared food was wasted. The objectives of this study were to co-design, and assess the acceptability, feasibility and appropriateness, of a "sustainable and healthy food toolkit", to support ECEC centres to make practical changes to promote sustainability and planetary health, while maintaining standards for promoting child nutrition.

METHODS
A "sustainable and healthy food toolkit" was co-designed with the sector based upon the Food and Agriculture Organization and World Health Organization sustainable healthy diets guiding principles. The toolkit promotes plant-based proteins, vegetables, fruits, wholegrains, locally sourced foods, drinking water/milk, and adequacy without exceeding needs, while discouraging highly processed foods, food packaging and food waste through a suite of co-designed tips and resources. A 3-arm intervention randomly assigned participating ECEC centres in Victoria, Australia, to receive either the toolkit, a food waste audit tool, or both. ECEC educators, directors and cooks participated in pre-and post-intervention surveys, including Weiner et al's implementation outcome measures for acceptability, appropriateness and feasibility of interventions, which were analysed descriptively, and open-ended items to describe practice changes, analysed thematically.

RESULTS
Post-intervention data collection concludes in February 2025. Of 44 centres recruited, 28 completed the intervention by December 2024. Sixteen received the toolkit (10 completed), 13 received the audit (11 completed; not included in these analyses), and 15 received both (7 completed). Preliminary analyses of respondents that received the toolkit or both (20 staff from 8 centres) shows that 85% agree that the toolkit is acceptable, 80% agree that it is appropriate, and 75% agree that it is feasible. All educator respondents (n=11) reported practice changes such as involving children in serving food portions proportionate to appetite, and discussing food sourcing and food waste with children.

CONCLUSIONS
Preliminary findings suggest acceptability, appropriateness and feasibility of a co-designed toolkit to support sustainable healthy food practices in ECEC, with positive changes in practice. The toolkit can be adapted with country-specific resources.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_073

PRELIMINARY SCOPING OF THE EVIDENCE-BASE ON CARBON EMISSION FACTORS AND FOOD COMPOSITION DATA IN THE UK

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BACKGROUND AND OBJECTIVES

Climate change is a significant health and environmental challenge. Sustainable dietary changes are estimated to reduce global Greenhouse Gas Emissions (GHGe) by up to 32% (1). Food composition databases provide important reference data for clinical practice, industry, nutrition policy and research (2). Linking environmental factors with composition databases is key to advancing research on sustainable and healthy diets and provide an evidence base for the development of Sustainable Food Based Dietary Guidelines (SFBDG)(3), as already developed by countries such as Denmark, Sweden, and Germany (2). The objective of this study is to conduct a preliminary search to assess the current evidence base on emission factors and food composition data, identify sources of information underpinning emission factors, and highlight gaps and limitations in linking nutrition and sustainability data for the UK.

METHODS

Studies with emission factors and food composition data within the UK were reviewed. The search was completed on PubMed on December 6th 2024. Search criteria were defined as follows; (Emission factors OR carbon OR environmental impact OR environmental metrics) AND (Composition database OR Composition data OR Composition dataset) AND (Food OR Recipe) AND UK AND (Life Cycle Assessment OR LCA), for years 2014 to 2024.

RESULTS

Fourteen scientific papers were identified and manually reviewed. Five were excluded (One as a retracted article, three as no emission factors, one as not food related) (Figure 1). Nine scientific publications with carbon emission factors and food composition data are available in the UK, one being a literature review and eight representing original research. The search RESULTS consisted of five studies quantifying LCA in products, two exploring dietary sustainability, and two focusing on food waste and menu-based interventions.

CONCLUSIONS

This preliminary search provides the first step in a systematic evaluation of the research available on food composition data and carbon emission factors in the UK. This search indicates a fragmented body of work, underscoring the need for standardised search criteria and larger scope to fully evaluate the evidence base. Integrating emission factor databases with food composition data is essential in ensuring environmental impact can be considered in industry, healthcare and research. Future research should evaluate additional sources using extended search terms, include multiple sources such as grey literature and non-open access databases, and incorporate additional environmental factors.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_074

FOOD AND NUTRITION SUSTAINABILITY KNOWLEDGE AND DIET AMONG STUDENTS

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BACKGROUND AND OBJECTIVES
The current South African food system and emanating consumer food choices have a direct impact on climate change. This study aimed to investigate food and nutrition sustainability knowledge and practices among university students and appraise the diet quality and the impact of diet on the environment through an event to advance consciousness towards food and nutrition sustainability.

METHODS
In this cross-sectional study, awareness, knowledge, and attitudes of food and nutrition sustainability were investigated among 405 registered university students at a university using a validated questionnaire. Diet was recorded using a 24-hour food recall, and diet quality was assessed through the global diet quality score (GDQS). The environmental impact of the diet was assessed using an online environmental food carbon footprint calculator to determine greenhouse gas emissions. Lastly, an event called the SAFBUC was implemented to advance consciousness towards food and nutrition sustainability. Data was analysed using descriptive statistics, chi-square goodness-of-fit-test, one sample t-test and the Mann-Whitney U test.

RESULTS
A notable 54.8% (n=222) of students were unfamiliar with the Sustainable Development Goals (SDGs), and the remaining 45.2% (n=183) heard of it but lacked knowledge. Male participants showed major micronutrient deficiencies, including calcium (74.3%), magnesium (96.7%), vitamin D (92.8%), vitamin K (89.5%), and folate (94.1%). Female participants had similar nutrient inadequacies, particularly in dietary fibre, calcium (94.0%), magnesium (93.1%), vitamin D (93.1%), vitamin K (83.1%), and folate (92.3%).
The global diet quality score (GDQS) indicated that 99% of students were at high risk for nutrient inadequacy and related non-communicable diseases (NCDs). Males had a significantly higher dietary carbon footprint (308,060 CO_2e) compared to females (23,910 CO_2e). In response, the South African Food Boost University Challenge (SAFBUC) was introduced to encourage greater fruit and vegetable consumption. These findings highlight the need for enhanced awareness and dietary improvement among students.

CONCLUSIONS
This study highlights the lack of knowledge and awareness related to food and nutrition sustainability among young university adults. The study underscores the need for targeted educational interventions to bridge the knowledge gap and empower young adults to make informed and sustainable food choices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_075

IDENTIFYING NUTRIENT QUALITY METRICS SUITABLE FOR A COMBINED NUTRITIONAL AND ENVIRONMENTAL ASSESSMENT OF GRAIN PRODUCTS: A CASE FROM SWEDEN

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BACKGROUND AND OBJECTIVES

Grain-based foods are essential for human nutrition, but their nutritional quality can vary greatly. These products generally have a low carbon footprint and may fulfill consumer's interest in environmentally friendly foods. Therefore, the sustainability assessment of grain-based foods should integrate environmental impact and nutritional quality. The aim of this study is to identify suitable nutrient quality metrics and apply them as complementary functional units (FUs) to carbon footprints in grain-based products consumed in Sweden.

METHODS

To identify nutrient quality metrics, a literature search was conducted between 2014-2024 in three databases (Scopus, PubMed and SciFinder). Selected nutrient quality indicators were applied to 378 grain-based products from the Swedish food composition tables [1]. Sweden-representative carbon footprints [2] were matched, and suitable nutrient metrics used as complementary FUs. Ranking of foods according to different nutrient-based FUs will be assessed for alignment with the Nordic nutrition recommendations [3].

RESULTS

RESULTS are preliminary, as the project is still on-going. The literature searched retrieved 1320 articles, of which 19 were included. Nine different nutrient metrics were identified and screened for suitable application as FU to grain-based products in Sweden. The following front-of-package nutrition labelling and other scoring systems were chosen: Carbohydrate Food Quality Score (CFQS)- 5 [4], Nordic Keyhole [5], Nutrient Rich Foods (NRF) 11.3 [6], Nutrient Rich Food Index carb (NR-FIcarb) [7], Nutri-Score [8], Nutri-Score with whole grains [9]. All indicators, except the Nordic Keyhole, could be applied as FU when ranking foods for their carbon footprint. The percentage of products defined as high nutritional quality according to the indicators was as follows: 41.3% for Nutri-Score; 39.9% for NRF 11.3; 30.4% for Nutri-Score with whole grains; 25.9% for CFQS-5; 17,7% for Keyhole.

CONCLUSIONS

Six different nutrient metrics were identified for their suitability to assess grain-based products in Sweden, of which 5 can be used as FU. Among them, Nutri-Score and NRF11.3 showed the highest percentage of products qualified as high nutritional quality. Once completed, the project will provide an indication of the best suited metric to be applied in integrated nutritional and environmental assessments of grain-based foods.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_076

STRATEGIES FOR REDUCING FOOD WASTE: EDUCATIONAL AND CAMPAIGN INTERVENTIONS IN AN APPLIED UNIVERSITY SETTING

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BACKGROUND AND OBJECTIVES

The HAS green academy aims to reduce food waste by half through a systematic approach that combines measurement, education, and intervention. As a first step the amount of food waste in the building was measured, highlighting the reduction potential (70-90 kg of food waste per week, of which 1/3 in food preparation areas, 1/3 waste bins, and 1/3 catering). A three-year "Zero Food Waste Challenge" was introduced, targeting applied universities in the Netherlands focusing on: awareness building, understanding who is contributing (students, staff, catering personnel and guest) and new product development with waste streams. Based on those activities a campaign was launched to reduce food waste in event catering. This research aims to identify whether the campaign was effective by measuring the food waste.

METHODS

A number of qualitative measurements are carried out to determine the % of leftovers. This is done at different types of events such as lunches with a maximum of 20 people and a number of larger events such as a dinner for employees (n=200) and Christmas breakfast (n=300).

RESULTS

RESULTS of food waste measurements across different event types and outcomes of qualitative interviews

CONCLUSIONS

In the presentation we will present whether awareness around food waste has been increased and whether the campaign has led to food waste reduction and what further actions should be implemented. The presentation will detail the effectiveness of the campaign interventions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_077

REAL-TIME NUTRITION INTAKE IN INTELLIGENT SELF-SERVICE RESTAURANT

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BACKGROUND AND OBJECTIVES

Objective and accurate measurement of dietary intake is a major challenge when investigating nutrient intake. The objective is to present the usability of an intelligent Self-Service Restaurant (SSR), in measuring nutrient intake during lunch. SSR in this study is a multidisciplinary research platform, located in the University campus, with an estimated 600 diners/day.

METHODS

In this study, we evaluated lunch nutrition intake in SSR using data from 157 participants. Nutrient intake data were available from 132 participants (83% female, 18% male; age (mean 40.2, [12.3]). Detailed data were collected via scales and RFID-tagged trays that track food choices and nutrient content. Participants were divided into age groups (AG): AG 1) 8-29 years; AG 2) 30-39 years; AG 3) 40-49 years; AG 4) 50-59 years; and AG 5) 60-70 years.

RESULTS

Significant differences in nutrient intake between vegetarian (VG, n=67) and meat (MT, n=65) main courses were found in: fiber (Median 6 [IQR 5-8]g VG vs. 5 [4-6]g MT, $p<0.001$, Mann-Whitney U test), carbohydrates (52[43-67]g VG vs. 41 [32-57]g MT, $p<0.001$), protein (17 [15-21]g VG vs. 16 [12-21]g MT, $p=0.047$), NaCl (1.5 [0.9-2.3]g VG vs. 1.8 [1.4-2.3]g MT, $p=0.033$) and energy 340 [328-532]kcal VG vs 337 [269-436]kcal MT, $p=0.006$). Further statistically significant differences were detected between the AGs in intake of fat (15 [12-26]g AG 1 (n=29) vs 11 [8-15]g AG 2 (n=42), $p=0.03$; and 10 [7-16]g AG 4 (n=27), $p=0.01$ (Kruskal Wallis and Mann-Whitney test with Bonferroni corrections), and protein (19 [15-27]g AG 1 vs. 14 [11-17]g AG 4, $p=0.01$), carbohydrates (57 [48-83]g AG 1 vs 40 [28-58]g AG 4, $p=0.040$) and energy (443 [354-643]kcal AG 1 vs 310 [246-460]kcal AG 4, $p=0.020$). Gender differences were observed in intake of fat (11 [8-15]g W vs 14 [11-20]g M, $p=0.009$), protein (16 [13-20]g W vs 20 [15-25] g M, $p=0.019$), carbohydrates (45 [35-59]g W vs 57 [45-76] g M, $p=0.01$), NaCl intakes (1.6 [1.1-2.1]g W vs 2.3 [1.6-3.4]g M, $p<0.001$), and energy (372 [296-439]kcal W vs 451 [352-586]kcal M, $p=0.006$).

CONCLUSIONS

Intakes of fiber, protein, carbohydrates and energy were higher while intake of NaCl was lower in VG as compared to MT. Fat, proteins, carbohydrates and energy intake were higher in younger compared to older participants. Measuring nutrient intake in Intelligent SSR, provides accurate information on nutrient intake in real-time in a large scale, which can be utilized e.g., when studying the impact of background and behavioural on dietary choices.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_078

CONSUMER PERCEPTION AND NUTRITIONAL EVALUATION OF PLANT-BASED MEAT ALTERNATIVES IN KOREA

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BACKGROUND AND OBJECTIVES
As demand for alternative meats rises worldwide, driven by concerns about climate change, environmental protection, animal welfare, and ethical consumption, more people are choosing plant-based meat alternative products. The purpose of this study was to assess the consumer perceptions and nutritional value of plant-based meat alternatives.

METHODS
This study was conducted in three stages. In the first stage, a survey was conducted to assess consumers' perception of plant-based meat alternatives. In the second stage, the nutrient content of commercial plant-based meat alternatives was examined. In the final stage, the mineral and dietary fiber contents of plant-based meat alternatives was analyzed. A total of 410 adults were surveyed regarding their awareness, experience, consumption, and purchase behavior of plant-based meat alternatives. Nutritional information was gathered from nutrition labels at online stores for 118 plant-based meat alternatives and 65 plant-based instant foods. Additionally, 22 plant-based meat alternatives and 24 meat products were analyzed for mineral content using ICP-MS and for dietary fiber content using the enzymatic-gravimetric method.

RESULTS
The findings indicate that consumers are relatively aware of plant-based meat alternatives, with an average awareness score of 3.8 out of 5. Awareness was significantly higher among individuals who were older, married, had a higher level of education, were more health-conscious. Additionally, participants had a high level of experience and intention to use plant-based meat alternatives. In terms of nutritional comparison, plant-based meat alternatives were found to be lower in energy, fat, saturated fat, trans fat, and cholesterol compared to meat products. However, they had higher sodium content. Regarding minerals, plant-based meat alternatives contained higher levels of calcium, magnesium, iron, copper, manganese, molybdenum, and chromium, but zinc than meat products. Moreover, plant-based meat alternatives were found to have significantly higher dietary fiber content both per serving and per 100 g compared to meat products.

CONCLUSIONS
Overall, while plant-based meat alternatives are higher in sodium and lower in zinc, their nutritional profile is generally better than that of animal-based meats, making them a healthier option in most respects. These findings suggest that consumer awareness of and intention to use plant-based alternatives are high, highlighting the potential for these products to be a viable part of a healthy diet.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_079

MINIMALLY PROCESSED, NOVEL FOOD PROTOTYPES MADE WITH WATERCRESS TO IMPROVE NUTRIENT DENSITY OF DIETS IN FOOD INSECURE POPULATIONS

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BACKGROUND AND OBJECTIVES
Diet-related chronic diseases such as cardiovascular diseases and type 2 diabetes continue to increase globally, including the UK, arising from poor diet quality, with lower intakes of protective foods such as fruit and vegetables and greater intakes of harmful foods, including those made from highly processed refined carbohydrates and saturated fats (1). These chronic diseases affect disproportionately in food insecure populations, who often suffer from 'hidden hunger', having inadequate nutrient quality to maintain optimal health (2). Drivers for this include the inability to purchase fresh produce and a preference to spend limited food budget on energy-dense, convenience foods. Thus, there is an urgent need to provide tasty, affordable, convenient and minimally processed nutrient-dense fruit/vegetable products, to increase consumption of these foods within food insecure populations.

METHODS
Watercress being one of the most nutrient dense of all vegetables (3), we collaborated with The Watercress Company, Dorset, UK to use surplus watercress, often discarded in farms, to convert them into two accessible and popular food prototypes, namely watercress pesto and watercress soup. Using these prototypes, we undertook a consumer survey and sensory evaluation in 60 participants using a mixed-methods approach. Quantitative data were gathered through surveys and opinion cards, combining fixed criteria with open-ended comments for a comprehensive analysis. Participant sampling was carefully designed to ensure a broad age (18-75 years) and gender profile (65% F) and strong representation from food insecure groups.

RESULTS
The study revealed very good or good ratings for both prototypes as taster options for taste (82% Pesto, 73% Soup), texture (82% Pesto, 72% Soup), appearance (both 83%) and overall likings (77% Pesto, 66% Soup). Pesto was preferred by younger individuals, whereas, soup was preferred in older individuals (age ≥50 years). The food prototypes were also tested as part of main meal options and found similar consumer acceptability.

CONCLUSIONS
This proof-of-concept study demonstrated that surplus nutrient-rich agricultural commodities can be converted into minimally processed food prototypes with a favourable consumer and sensory profile. This in turn will decrease food waste in farms (at source), reduce cost of fresh produce and can increase both accessibility and affordability of these foods and thereby improve nutrition and food security in vulnerable populations, who often do not meet their fruit and vegetable intake recommendations.

CONFLICTS OF INTERESTS
Tom Amery is the Managing Director of The Watercress Company. There was no funding from the company except for in-kind provision of the watercress used in the study. The company did not have any role on the study design or RESULTS interpretation.

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EPO2_080

FOOD ENVIRONMENT IMPACT ON FOOD CHOICES, FOOD SECURITY AND NUTRITION TRANSITION IN SOUTH AFRICA

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BACKGROUND AND OBJECTIVES
Food environments are the interface through which people interact with the broader food systems. To determine the effects of food environments on peoples' food choices and food security, it is crucial to understand what people consume and the type of environment around them. This paper investigated the impact the food environment has on food choices, food security and nutrition transition in South Africa.

METHODS
The study reviews the work done by the research chair in food, environment and health in South Africa. The three studies employed an analytical, cross-sectional study, using quantitative techniques across three provinces (Limpopo, Western Cape and Mpumalanga) in South Africa.

RESULTS
In Western Cape province, almost a quarter of the households were food secure. A majority (96.7%) of spaza shops were present in the communities and a total of 88.8% had staple food available. Households that had a medium score (score of 8 to 11) were 44.1% and those with an excellent score (14-17) were 24.4%. Anxiety and uncertainty over food was experienced by 71% of the household participants as they were worried that their households would run out of food in the past month. In Mpumalanga province, only 21.9% of households were food secure. Over two thirds (74.0%) experienced the domain: anxiety and uncertainty over food and less expensive foods was the common coping strategy in 62.3% of households when experiencing food shortages. Over two thirds of the households had a low score (score of 4 to 7) were 68.8% and surprisingly, there weren't any with adequate and excellent dietary intake. The household food environment lacked diversity and most of the households were food insecure. Affordability was an important factor in households when accessing food. In Limpopo (Nedzingahe et al 2023), almost half of the households (48.4%) had a low dietary diversity Score. The study further revealed that 46.0% of households were food secure. The study revealed that 45.2% of households faced anxiety and uncertainty over food, having had worried about the availability of food in the household, and 46.0% had insufficient food intake in the preceding month.

CONCLUSIONS
The studies highlighted that food environment influences food choices, food security and nutrition transition. The reasons for the persistence of hunger and malnutrition in South Africa are complex and interrelated, spanning environmental, health, economic, socio-political and agro-food issues.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_083

FROM THE MARKET TO THE BIN: INFLUENCE OF EMOTIONS AND GENDER ON FOOD WASTE PRACTICES

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BACKGROUND AND OBJECTIVES
Around one-third of the world's food production is lost or wasted annually (FAO, 2011, UNEP, 2024). This issue has profound environmental implications and is directly related to food insecurity, as resources and nutrients are squandered while millions face hunger and malnutrition. Despite extensive data on the volume of food waste, the cultural and behavioral factors that underlie the transition of food from "edible" to "inedible" remain underexplored. This study investigates the cultural dimensions of food waste in households.

METHODS
Using ethnographic methods, data were collected through in-depth interviews and participant observation with eight middle-class Chilean migrant households in Berlin. The study employed a Grounded Theory approach to explore the meanings and behaviors associated with food management and waste practices.

RESULTS
Women in these households were typically the "food gatekeepers," responsible for food-related tasks and expressing strong emotional responses to waste (Russell et al., 2017). Nutritional discourse created tension between two key imperatives: the desire to avoid waste and the pressure to maintain balanced diets. These conflicts revealed complex, culturally influenced decision-making processes that mediate the transition of food from "edible" to "inedible."

CONCLUSIONS
This research highlights the central role of cultural and emotional factors in shaping food waste behaviors. By understanding how gender roles and cultural norms influence food waste practices, the study provides a framework for further research on sustainable dietary behaviors. These findings underscore the importance of integrating socio-cultural dimensions into nutritional science to address nutrition guidelines and food waste cohesively and effectively.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_084

ASSOCIATION BETWEEN WATER INSECURITY AND FOOD INSECURITY IN PANAMA: IMPLICATIONS FOR PUBLIC POLICY AND VULNERABLE POPULATION

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BACKGROUND AND OBJECTIVES
Food insecurity is a well-documented social phenomenon; however, its relationship with water insecurity in Panama remains understudied. This research aims to determine the association between water insecurity and food insecurity in Panama.

METHODS
An observational, analytical study was conducted using a cross-sectional survey administered from January to March 2024. An online questionnaire was used to collect sociodemographic data (e.g., sex, age, income, employment status), as well as information on food and water security. Food insecurity was assessed using the FAO's Food Insecurity Experience Scale (FIES), estimating probabilities of moderate to severe, and severe food insecurity through the RASH method. Water insecurity was measured using the Household Water Insecurity Experiences (HWISE) scale. Linear regression and multiple logistic regression were applied to determine associations between food insecurity and water insecurity, adjusting for sociodemographic variables.

RESULTS
A total of 222 participants, aged 18 to 78 years, were evaluated; 66% were female, 86% resided in urban areas, 83.3% had a high educational level (higher education), and 53.6% reported monthly incomes of USD 1,000 or more. The mean prevalence and margin of error for moderate to severe food insecurity were 29.7% (±8.1), while severe food insecurity alone was 6.1% (±4.3). Additionally, 27% of households were classified as experiencing water insecurity. Moderate to severe food insecurity was associated with water insecurity (β=19%; 95% CI: 8%–31%) and with economic income (no income vs. USD 1,000+/month: β=25%; 95% CI: 5%–44%; USD 501–1,000: β=11%; 95% CI: 1%–22%). Water insecurity was linked to the probability of moderate to severe food insecurity (OR=5.58; 95% CI: 2.53–13.22), lack of access to potable water (OR=4.58; 95% CI: 1.21–17.38), and the number of household members (OR=0.33; 95% CI: 0.15–0.72).

CONCLUSIONS
High prevalence of food and water insecurity was observed, both strongly associated with sociodemographic variables. Comprehensive public policies addressing structural determinants of food and water insecurity are urgently needed, particularly to support the most vulnerable populations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_085

INTEGRATING BIODIVERSITY, CLIMATE CHANGE, AND NUTRITION: PATHWAYS TO SUSTAINABLE HEALTHY DIETS AND FOOD SECURITY

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BACKGROUND AND OBJECTIVES
The interrelationship between biodiversity, climate change, and nutrition presents complex challenges for achieving sustainable healthy diets and long-term food security. Current dietary patterns, characterized by high consumption of highly processed foods and beverages derived from a limited number of commodities, negatively impact the environment through greenhouse gas emissions, excessive water and land use, and biodiversity loss. This review aims to explore the nexus between biodiversity, climate, and nutrition, emphasizing strategies for sustainable healthy diets and identifying critical research and policy gaps.

METHODS
This narrative review synthesizes existing literature and reports to examine the interconnectedness of biodiversity, climate change, and nutrition. It highlights the environmental impacts of current dietary patterns and discusses strategies and interventions that support sustainable healthy diets. The review also identifies gaps in research and policy integration needed to address these global challenges.

RESULTS
Sustainable healthy diets, defined by diverse intake of unprocessed or minimally processed foods, balanced across food groups, and restricted consumption of highly processed products, can reduce the environmental footprint of agrifood systems. Promoting biodiversity through neglected and underutilized species, valorizing food by-products, and adopting climate-resilient agricultural practices enhances nutrition and builds climate resilience. Strategies include public education, government policies, economic incentives, technological innovations, and food system-based dietary guidelines. Front-of-pack nutritional warning labels guide consumers toward healthier choices. Working with parliamentarians to strengthen food security legislation is crucial for enabling sustainable diets. Robust data collection and analysis are essential for monitoring progress, evaluating policies, and guiding evidence-based interventions. Nutrition education empowers communities to make informed choices aligned with health and sustainability goals. However, critical gaps remain, including integrating biodiversity data into decision-making, assessing trade impacts on local systems, and fostering multidisciplinary research to address these challenges.

CONCLUSIONS
The nexus between biodiversity, climate change, and nutrition underscores the central role of food systems in supporting ecosystem functions, providing nutritious options, and mitigating climate change.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_086

COMPLEXITIES OF THE AGRICULTURAL VALUE NETWORK COULD LIMIT SYSTEM CHANGES TO REDUCE GREENHOUSE GAS EMISSIONS

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BACKGROUND AND OBJECTIVES

Food producers are increasingly asked to adapt their behaviours to reduce their environmental impacts, since the food system is a major driver of greenhouse gas emissions and biodiversity loss. However, farms are constrained by the realities of running a business and by their place within the wider food system. The objectives were first to examine the likelihood and magnitude of transitions between farm enterprise types, and then to explore the potential for change given the shared resources between different farm activities.

METHODS

We analysed Scottish agricultural census data (2012-2020) to determine how often farms change, and the type of change between EU economic classes, e.g., changing from sheep to beef, or from dairy to horticulture. We analysed the inputs and outputs of the main farming activities (e.g., machinery and land requirements, fertiliser or feed as inputs and grain or livestock as outputs) as a network to determine how similar different enterprises are in terms of shared resources as a proxy for how difficult it would be to adapt from one to another. Finally, we compare the classification of farms by their current activities, defined by economic stratification into 46 categories, versus their potential to adapt given their current resources.

RESULTS

Farms are unlikely (probability < 0.01) to change their economic classification between years. Farms were most likely to stay the same (mean probability = 0.59), but this varies by farm type. Changes were typically modest, moving between activities that shared most resources, for example sheep and cattle to specialist sheep or specialist indoor vegetables to mixed indoor specialist. The farming system is highly interconnected through resources, with land and labour the most connected resources, but organic excreta the most central, linking arable and livestock activities.

CONCLUSIONS

Together with biophysical constraints in Scotland, these RESULTS demonstrate the practical and financial challenges for farms to make the significant changes needed to lower emission activities. Furthermore, the farming network is highly sensitive to the continued availability of resources and would necessitate alternative sources or substitutes if some (e.g., organic manures) were removed.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_087

SEAFOOD SUPPLY MAPPING REVEALS PRODUCTION AND CONSUMPTION MISMATCHES AND LARGE DIETARY NUTRIENT LOSSES THROUGH EXPORTS IN THE UNITED KINGDOM

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BACKGROUND AND OBJECTIVES
Transforming our diets to build a more healthy and sustainable food system is paramount to improving public health and achieving net zero. Arguably, such diets will include more seafood. For the first time, we provide a high-resolution perspective on United Kingdom (UK) seafood supplies and nutrient flows, by species and sector, as a case study for high-income countries worldwide that have a high reliance on trade to keep fisheries and aquaculture profitable, but also to meet consumer demand and preferences.

METHODS
We mapped seafood production (capture and aquaculture data), trade (imports and exports), purchases (within and out-of-home), and seafood consumption (national diet survey), between 2009 and 2020.

RESULTS
Overall, the UK is a net importer of seafood. UK dietary recommendations for finfish consumption were not achieved by domestic production nor national supplies. Mapping dietary nutrient flows revealed that through imports of prawns, cod, and haddock, the UK experiences net gains in selenium and iodine, although the contribution towards the RNI of these nutrients is relatively small. The UK undergoes significant losses of omega-3 fatty acids, vitamins B12 and D, that could potentially contribute 73%, 46%, and 7% towards UK recommended nutrient intakes, respectively, through exports of oily fish such as salmon, herring, and mackerel.

CONCLUSIONS
We highlight the potential opportunities to reshape our seafood supply chains, by proposing increased consumption of locally caught species, such as herring, and mackerel, that optimise nutrient intake, whilst at the same time considering ways to reduce climate emissions and reduce pressures on aquatic stocks from nutritionally vulnerable nations. Understanding how national seafood consumption relates to food supply chains and global trade is essential to help develop both fisheries as well as public health policies that promote the consumption of locally produced species.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_088

CAPABILITY, OPPORTUNITIES AND MOTIVATION TO REDUCE MEAT CONSUMPTION AND PERCEIVED EFFECTIVENESS OF POLICY INTERVENTION TO REDUCE MEAT CONSUMPTION

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BACKGROUND AND OBJECTIVES
Transitioning to sustainable diets is crucial if climate targets are to be met, which means reducing consumption of animal-based foods. However, population-level dietary changes are notoriously difficult, and eating less meat is particularly unpopular. The objectives were (i) to explore people's motivation, capability and opportunities to reduce meat and (ii) to determine what are viewed as effective policy interventions.

METHODS
A nationally representative population of adults living in Scotland completed an on-line survey (n=1590) to assess current patterns of current and future meat consumption based on Capability, Opportunities and Motivation (COM-B model of behaviour change). Latent Class Analysis (LCA) was used to identify different subpopulations of participants based on their responses to the COM-B statements. Participants ranked from best to worst their view of the effectiveness of different interventions aimed at reducing meat consumption.

RESULTS
Sixty one percent of participants reported being willing or currently reducing their meat consumption. The LCA revealed four subgroups; Resistant (14%), Ambivalent (25%), Open (45%) and Actively seeking to reduce meat (16%). The Open class were moderately motivated to change and reported some opportunities and capability but felt economically constrained. Interventions to reduce the price and improve tastiness of non-meat alternatives were viewed as most effective, while those aimed at raising awareness (e.g. media and other communication) least effective. Perceived effectiveness of different policies was very similar across all LCA subgroups.

CONCLUSIONS
Policies interventions targeting pricing of plant-based alternatives and tastiness, rather than only on education, are likely to be more effective.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_089

PROGRESS, BUT NOT FAST ENOUGH: A DECADE OF CHANGES IN ATTITUDES OF ADULTS AND YOUNG PEOPLE TOWARD SUSTAINABLE DIETS

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BACKGROUND AND OBJECTIVES
It is important to understand if and how attitudes and willingness to change diets have moved on in the past decade to gauge the action needed today. More information is available to the general population about dietary changes required to achieve targets to reduce greenhouse gas emissions, in particular reducing consumption of meat, however changes in how this information is received are needed. The objective of the study was to revisit populations within the same geographic regions after 10 years to observe any changes in knowledge, attitudes towards the impact of diets on climate change, and willingness to modify diets.

METHODS
Focus groups were used to provide an in-depth understanding of views and knowledge of the contribution of diets to climate change and willingness to take action. The focus groups were conducted in 2013 and then again 2023 with different groups of people but within the same geographic areas and age groups, with a similar range of socio-economic situations. Focus groups were conducted with adults (> 18 years) and young people in secondary school (11-18 years) separately. Thematic analysis was used to identify themes around how the food system was perceived to contribute to climate change, willingness to reduce meat consumption and confidence in the information received.

RESULTS
In general, over the decade, knowledge about the association between meat consumption and climate change increased, with a greater awareness of the association than in 2013. People today were more receptive to the concept of reducing meat, albeit this was not the case for all participants. Scepticism surrounding information about the association between food and climate remained, including that from scientists and media. A theme of agency emerged around the relative merits of an individuals' actions to make a difference and how this impacts willingness to do so. Other persisting beliefs included other actions, such as reducing packaging and food miles by choosing local food, that were deemed more important than dietary changes.

CONCLUSIONS
The study shows that knowledge has increased over the past decade with more media exposure to the science being published, but that this information is not always trusted. While progress is being made in changing attitudes towards reducing meat consumption, the pace of change and resultant action needs to accelerate to make the impact required to limit climate change.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_090

ECONOMIC AND ENVIRONMENTAL IMPACTS OF COMMERCIAL MILK FORMULA IN INDONESIA: ESTIMATES USING THE MOTHERS MILK TOOL AND GREEN FEEDING TOOL

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BACKGROUND AND OBJECTIVES
The health importance of breastfeeding for infants, young children and their mothers is increasingly acknowledged but the economic and environmental impact of suboptimal breastfeeding is less recognised. Breastfeeding has been declining, and sales of commercial milk formula (CMF) are rising rapidly in East Asia Pacific Region, including Indonesia. This study aims to analyse the economic and environmental impacts of CMF marketed for infants 0-6 months in Indonesia

METHODS
We assessed economic and environmental impacts of CMF in Indonesia using the Mothers Milk Tool (MMT) and the Green Feeding Tool (GFT). These tools estimate countries' production of human milk, and carbon and water footprints using UNICEF datasets on births and infant and young child feeding practices, and key assumptions about infants' daily milk intake, and carbon and water footprints of CMF.

RESULTS
The MMT analysis reveals a substantial economic loss from CMF displacing breastmilk in Indonesia: at least 62.42 million liters of breastmilk were lost in 2020 due to introduction of CMF among infants aged 0-6 months. The monetary value of breastmilk is US$45.5 billion annually. Also in 2020, 27,200 tonnes of CMF were sold in Indonesia and loss of economic value was US$6.2 billion. The GFT estimated a carbon footprint of 213.80-272.10 million kg of CO2 and a water footprint of 92,460 million liters

CONCLUSIONS
Current breastfeeding practices in Indonesia are associated with substantial economic production loss, as well as carbon and water footprints. For informed policy-making, we recommend including breastmilk in national food balance sheets to facilitate its inclusion in GDP, and strengthening advocacy for breastfeeding as a measure to improve the environment

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_091

DIETARY-RELATED EXPOSURE ASSESSMENTS IN THE EUROPEAN PROSPECTIVE INVESTIGATION INTO CANCER AND NUTRITION (EPIC) COHORT: AN INTEGRATED MULTI-TIERED APPROACH USING THE FOODEX CLASSIFICATION SYSTEM

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BACKGROUND AND OBJECTIVES
Large-scale cohorts such as the European Prospective Investigation into Cancer and Nutrition (EPIC) (n~500,000) are invaluable for investigating health effects of dietary-related exposures such as food contaminants and additives. Dietary questionnaire intake data can be matched with food occurrence data to estimate individual dietary-related exposures. To provide a common link to the diverse food databases used by different European countries, EFSA has developed the FoodEx food classification system that standardises the identification and characterisation of foods and that is used in the EFSA chemical monitoring and food consumption database. We aimed to develop an integrated approach for calculating new dietary-related indicators such as food contaminants, additives and environmental food production indicators (e.g. greenhouse gas emissions) in EPIC.

METHODS
Stepwise procedures were used to facilitate matching of novel food occurrence data classified via the FoodEx classification system. Initially, the simplified EPIC food list which assembles the dietary questionnaire items (~12000 different foods reported) were categorised according to FoodEx. Thereafter, food occurrence data from the EFSA occurrence databases could efficiently be matched with the EPIC dietary intake data via their FoodEx coding. Finally, individual-level dietary exposures could be computed by multiplying EPIC individual dietary intakes (in g/day) with the food occurrence data (in μg/kg food) matched with the EPIC food list items.

RESULTS
The end-user EPIC dietary exposure databases can be used to investigate associations between dietary exposures (e.g. contaminants, additives) and health risks (e.g. cancer risk, mortality, etc.). To consider uncertainties in food occurrence data, three different scenarios were calculated, namely a lower, middle bound and upper bound approach. RESULTS for cadmium exposures are used as an example to describe the different procedures and computations involved in these exposure calculations.

CONCLUSIONS
This work facilitates the further matching of diet-related indicators such as food contaminants and additives, but also planetary health indicators related to our food consumption data that were coded via the EFSA FoodEx classification. A detailed description of the procedures used in EPIC and the problems encountered can be of interest for future projects aiming to link their food consumption data with the FoodEx classification system.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_093

THE BURDEN OF NON-COMMUNICABLE DISEASES ATTRIBUTABLE TO DIETARY RISKS IN CHINA AND ITS PROVINCES, 1990-2021: AN ANALYSIS OF GLOBAL BURDEN OF DISEASE STUDY 2021

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BACKGROUND AND OBJECTIVES
Diet-related non-communicable diseases (NCDs) are significant contributors to global morbidity and mortality, including in China. However, the impact of dietary risk factors on the burden of NCDs has not been systematically evaluated in China and its provinces. This study aims to analyze the temporal trends and geographic variations in diet-related NCDs in China from 1990 to 2021.

METHODS
Utilizing a comparative risk assessment methodology, we estimated the proportion of disease-specific burden attributable to each dietary risk factor among adults aged 25 years and above. The primary inputs for this analysis encompassed the intake level of each dietary factor, the magnitude of the effect of the dietary factor on the disease endpoint, and the intake level associated with the lowest mortality risk. Subsequently, by employing disease-specific population attributable fractions, mortality data, and disability-adjusted life-years (DALYs), we computed the number of deaths and DALYs attributable to diet for each disease outcome.

RESULTS
In 2021, NCDs attributable to dietary risks in China led to 1,703,174 (95% UI: 687,641 - 2,683,260) deaths and 38,364,150 (95% UI: 16,198,391 - 58,567,281) DALYs. From 1990 to 2021, the age-standardized mortality and DALY rates decreased by 40.51% and 41.94%, respectively. The burden of cardiovascular diseases was the heaviest, and high sodium intake was the primary dietary risk factor. In some provinces such as Tibet, Heilongjiang, and Qinghai, the age-standardized mortality and DALY rates attributable to dietary risk factors were relatively high. In terms of different dietary factors, the burdens of high sodium and low fruit intakes remained relatively heavy, the burden of low vegetable intake decreased significantly, and the burdens of low polyunsaturated fatty acid and high red meat intakes increased in many provinces. From 1990 to 2021, the burden of diet-attributable chronic diseases in China was higher in men than in women, and the same was true for disease types such as cardiovascular diseases, tumors, diabetes, and chronic kidney diseases. The burden of diet-attributable NCDs was positively correlated with age, and the burden was the heaviest in the group of 70+ years.

CONCLUSIONS
The study underscores the pivotal role of dietary factors in driving NCD burdens in China, despite overall reductions in disease rates. Continued efforts are needed to mitigate dietary risks, particularly in regions where the burden remains high.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_094

CAN INCREASING LOCAL FOODS IMPROVE THE SUSTAINABILITY OF SCHOOL MEALS? A MULTI-OBJECTIVE OPTIMIZATION STUDY IN GUADELOUPE, FRANCE

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BACKGROUND AND OBJECTIVES
Guadeloupe, a French overseas region, faces rising rates of obesity and diet-related chronic diseases, with prevalence higher than in mainland France. School meals are a lever to promote healthy and sustainable diets and reduce health inequalities. The supply of foods locally produced in French overseas regions is encouraged by legislation to improve the sustainability of school catering. The objective was to assess whether increasing local products in school meals could be a lever for improving different dimensions of sustainability (nutrition, environment, cost), and to identify which local foods should be favored.

METHODS
Data on 47 series of 20 meals served in primary schools were collected from 27 school catering structures in Guadeloupe: meal components, dish ingredients, food price and source of supply. The nutritional quality and environmental impacts of the series of meals were respectively assessed by the mean adequacy ratio (MAR) expressed as a percentage of the daily recommendations in ‘positive’ nutrients, and greenhouse gas emissions (GHGE), water use, land use and a weighted score of 14 environmental metrics (single score). Optimized series of 20 meals were developed using mathematical optimization and compared to the observed series (baseline). The optimized series maximized the share of local products, complied with the French mandatory nutritional guidelines for school meals, and met two scenarios: i) no increase in cost and environmental impacts compared to observed levels (MAXLOCAL scenario), and ii) 30% reduction in cost and GHGE (MAXLOCAL-RED scenario)).

RESULTS
In MAXLOCAL, the proportion of local products was 77% (vs. 36% at baseline), MAR was improved (91% vs. 85% at baseline), GHGE and the single score were reduced by 14%, and land use by 30%. Cost and water use remained at baseline levels, and menu diversity was maintained (45 different foods in the series vs. 46 at baseline). Locally produced foods with the largest increases were identified across food categories: carrot and zucchini, pineapple and grapefruit, dry beans and yams, chicken. In MAXLOCAL-RED, the share of local products was 66%, MAR was 91%, the single score was reduced by 29%, water use by 20% and land use by 41%, but menu diversity was reduced (39 different foods).

CONCLUSIONS
This study identified school menus with increased amount of local foods, improved nutritional quality, and reduced environmental impacts at no additional cost or loss of menu diversity. Future research should test the implementation of these optimized menus in Guadeloupe schools to assess feasibility by school catering managers and acceptability by children.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_095

REPLACING ANIMAL MEAT WITH PLANT-BASED MEAT ALTERNATIVES: THE IMPACT OF PROTEIN QUALITY ON PROTEIN ADEQUACY IN THE DUTCH DIET

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BACKGROUND AND OBJECTIVES
A shift to more plant-based consumption patterns may lower the protein adequacy of diets. The objective of this study was to model the impact of replacing animal meat with plant-based meat alternatives on protein intake and adequacy while taking into account protein quality, in the context of the average Dutch diet.

METHODS
Habitual total and utilizable protein intakes were calculated from meal-based food consumption data from 1633 participants from 18 to 70 years of the Dutch National Food Consumption Survey 2012-2016. Utilizable protein intake was calculated as the sum of protein intake per meal adjusted for Protein Digestibility-Corrected Amino Acid Score (PDCAAS) and compared to the Estimated Average Requirement for Dutch adults to calculate the percentage of the population with an adequate protein intake. In the modelling scenarios all animal meat was replaced gram-for-gram by meat alternatives from various protein sources currently available on the Dutch market.

RESULTS
Replacing all meat with meat alternatives decreased the intake of animal protein from 59 to 36%, total protein intake from 1.14 to 1.09 g/kg/day, utilizable protein intake from 0.94 to 0.86 g/kg/day, and protein adequacy from 93 to 86%. Additional scenarios indicated that the protein adequacy was mostly impacted by total protein content, lysine content, and protein digestibility of the meat alternatives.

CONCLUSIONS
This modelling study indicated that when all animal meat was replaced by plant-based meats, total and utilizable protein intake remained adequate for the majority (86%) of the Dutch adult population. People who get most of their protein from plant-sources should ensure a sufficient total protein intake from a variety of sources.

CONFLICTS OF INTERESTS
AW and MD are employees of Unilever, a company that produces and markets foods and beverages including plant-based meat alternatives. The other authors report no conflict of interest.

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EPO2_097

COMPARING THE NUTRIENT COMPOSITION OF PLANT-BASED MEAT WITH ANIMAL MEAT AND LEGUMES: A REVIEW OF ANALYTICAL DATA ON 45 NUTRIENTS

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BACKGROUND AND OBJECTIVES
To date, publications on the nutritional quality of plant-based meat mostly focus on a limited range of nutrients derived from on-pack nutrition labels. We aimed to systematically review analytical data on the nutrient composition of plant-based meat and compare it with animal meat and legumes.

METHODS
Data sources were selected based on the availability of original and validated analytical data on plant-based meats. Nutrient levels were compared with animal meat and legumes, benchmarked against nutrient requirements (e.g. 15% of nutrient reference values), and nutrient density calculations were done based on 15 nutrients to encourage and 3 nutrients to limit.

RESULTS
Although plant-based meats can have distinct nutrient levels depending on the protein source, as compared to animal meat unfortified plant-based meat is similarly high in protein, lower in energy and saturated fat and higher in sugar, carbohydrates and fiber. When benchmarked against nutrient requirements, plant-based meat can be a source of alpha-linolenic acid, vitamins B1, B2, B3, folate, E, K, calcium, magnesium, manganese, copper, iron, potassium, phosphorus, selenium and zinc. However, unlike plant-based meat, animal meat can be a source of vitamins B5, B6, B12 and D. Compared to legumes, plant-based meat can contain more protein, energy, fat and sodium and similar or higher amounts of vitamins and minerals. Nutrient density was comparable between plant-based meat, animal meat and legumes.

CONCLUSIONS
Unfortified plant-based meats that are currently available on the market can offer unique types and quantities of essential nutrients, resulting in a similar nutrient density compared with animal meat and legumes. Whether plant-based meat should be fortified with micronutrients that animal meat specifically provides depends on the consumption pattern and needs further investigation. When product reformulation efforts to minimize nutrients to limit continue, plant-based meat fits in a healthy diet.

CONFLICTS OF INTERESTS
All authors are employees of Unilever, a company that produces and markets foods and beverages including plant-based meat alternatives.

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EPO2_100

ENHANCING ACCESS TO NATIVE FOODS IN FIJI FOR BETTER NUTRITION THROUGH COMMUNITY MAPPING

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BACKGROUND AND OBJECTIVES

Traditional subsistence farming systems in Fiji have been replaced by intensive farming of root crops, sugarcane, and kava for the export markets. The monoculture of these export commodities has affected the production and supply of native crops that are highly nutritious and resilient to the impacts of climate change. As a result of this limited access to native foods, such as yams, island cabbage (bele), plantains, and tree ferns, there is a high dependence on imported foods, such as rice, tinned meat, and instant noodles. The new diet, which consists of highly processed food, has caused an increase in non-communicable diseases, such as diabetes and obesity, among the Fijian population. Traditional farming systems produce a diverse range of native crops that are resilient and highly nutritious. The objective of this paper is to present the findings from community mapping as a tool for better access to native food around Fiji.

METHODS

A literature review of the nutritional data and the Pacific food composition was conducted using desktop analysis. A seven-day healthy food basket (HFB) consisting of only native foods for three household types (low-income, middle-income, and high-income) was developed through focus groups with local residents in each of the communities in the central and western parts of Fiji. The native foods identified in the food basket were collected from the central and western markets of Fiji using a purposive sampling technique. The food samples were categorized based on the different food groups.

RESULTS

Some varieties of native food were available in the local markets in each of the areas, but it did not complete the food basket consisting of only native foods. There were nutritious varieties of new crops available in the markets, but these were expensive for low-income households. The Ministry of Agriculture distributed the new varieties of crops as resilient crops for farmers. Seasonal variation and extreme weather events were some factors that affected the availability of some of these new crops in some areas. Native foods were limited in supply because of the shift in land use.

CONCLUSIONS

This paper presents the nutritional implications of the shortage of native food. The information gathered in this study can be useful for the Ministry of Agriculture and the National Food and Nutrition Center to understand the gaps and accessibility to nutritious native foods. The purchasing power of different households is also a factor that needs to be considered.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_101

FOOD BIODIVERSITY AND ITS ASSOCIATION WITH DIET QUALITY AND HEALTH OUTCOMES - A SCOPING REVIEW

Jinke Baan Hofman[1]; Celia Bannenberg[2]; Mariska Dötsch-Klerk[1]; Anne Wanders[1]; Corné van Dooren[3, 2]; Baukje De Roos[4]; Edith Feskens[2]; Sander Biesbroek[2]
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BACKGROUND AND OBJECTIVES
Food biodiversity is receiving increased scientific attention, due to the global food system being a major contributor to biodiversity loss. The FAO suggests that food biodiversity, defined as the diversity of plants, animals and other organisms used for food, may benefit both human and planetary health. Despite this potential, there is a lack of comprehensive understanding regarding the association of food biodiversity with healthy diets. This scoping review aims to present an overview of available data relating food biodiversity to diet quality and health outcomes.

METHODS
Three search strategies were performed in Scopus and PubMed to identify articles on food biodiversity related to 1) diet quality, 2) health outcomes and 3) environmental impact indicators.

RESULTS
Six studies were identified describing the association between food biodiversity and diet quality, of which one also evaluated health outcomes. Two additional studies were identified assessing food biodiversity and health outcomes. No studies were identified describing the association between food biodiversity and environmental impact. Four studies on diet quality quantified food biodiversity using Dietary Species Richness (DSR), one study used Nutritional Functional Diversity (NFD), and one study used both. All studies showed significant positive associations between food biodiversity and nutritional adequacy. However, the use of different metrics and methodologies hampers direct comparison of outcomes between studies and inference of implications. Two studies assessing food biodiversity and health outcomes -in a large EU cohort- showed a 10 to 20% reduced risk of total and cause-specific mortality and a 5% reduced risk of gastrointestinal cancers per 10-species DSR increment. Lastly, one study reported an inverse association between DSR and body fat percentage.

CONCLUSIONS
Although a limited number of studies was available, they consistently describe positive associations between food biodiversity and diet quality, and inverse associations with some health risks. Further research is needed to support and unravel the mechanism behind the association between food biodiversity and diet quality and health outcomes, and to explore how food biodiversity is associated with environmental impact.

CONFLICTS OF INTERESTS
Jinke Baan Hofman, Mariska Dotsch-Klerk and Anne Wanders are working for Unilever, a global FMCG company which produces and markets a variety of foods and beveragesThe other authors don't have a conflict of interest.

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EPO2_102

ESTIMATING THE SUPPLY OF NUTRIENTS FROM AGRICULTURAL COMMODITIES IN CLIMATE CHANGE SCENARIOS

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BACKGROUND AND OBJECTIVES
Governmental commitments to Net Zero will increase the demand for land from multiple sectors and is already taking land out of food production. Choices about where and what foods are produced is important for nutrition security, but has rippling consequences for land use, rural populations and the food system. The objective was to estimate the realised and potential nutritional value of land though the commodities produced considering future climate changes. We use Scotland as a case-study of a bioclimatically constrained high-income setting.

METHODS
Annual Scottish agricultural census data were used to identify commodities produced for human consumption, which were matched to the minimally processed foods items (e.g. flour from cereals), not necessarily what is eaten. The energy, macro- and micronutrient composition of these food items were taken from the UK Composition of Foods Integrated Dataset and mapped onto land based on the Land Capability for Agriculture classification of agricultural potential. Under climate change scenarios, the yield and area of each commodity was estimated to forecast nutrient supplies.

RESULTS
Cereals in Scotland are mostly used for purposes other than human consumption, such as alcohol and ruminant feed so their contribution to nutrient supply is attenuated despite their yields in Scotland likely increasing given climate change. A small range of vegetables with high yields are an important source of nutrients despite relatively little hectarage. However, ruminant meat production, which uses a significant proportion of agricultural land (including fodder crops, animal feed and grazing) has a disproportionately small contribution to nutrient supply. The supply of energy (71% of population needs), fibre (64.1%), iron (68.5%), selenium (59.7%), niacin (90.5%) and vitamins D (21.1%) and E (55.8%) are all less than that population needs from Scottish land alone.

CONCLUSIONS
Around half of the food consumed in Scotland is domestically produced. Understanding the potential and realised nutrient supply from domestic agricultural production helps to develop greater nutrition security of a country and opportunities to reimagine food production and land use.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_104

IMPACT OF THE 'RAISING THE PULSE CAMPAIGN' ON PULSE-RICH DISH SELECTION AND FOOD WASTE IN UNIVERSITY HALLS OF RESIDENCE AND CATERING OUTLETS

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BACKGROUND AND OBJECTIVES
Studies have reported higher intakes of pulses are associated with an optimum diet quality, higher micronutrient status and a more sustainable diet (Willet et al, 2019). However, nutrient dense foods such as vegetables contribute the largest portion of waste annually which could have a negative impact on the environment (Torode et al, 2023). The aim of this study was to assess the impact of the Raising the Pulse intervention (a pulse-enriched menu and educational campaign) on the selection of pulse-based meals and total food waste in University of Reading catering outlets.

METHODS
In collaboration with Menus of Change, a living lab consisting of 3x3 week interventions was designed. Weeks 1-3 acted as the control to assess meals purchased and waste produced. In weeks 4-9, a high pulse-enriched menu was introduced in two catered student halls of residence and a campus restaurant, first without informing the consumers (week 4-6); followed by our 'Raising the Pulse campaign' informing students of the pulse-enriched menu and the health and environmental benefits of consuming pulses using emails, posters, information sessions and table talkers (week 7-9). Food waste was calculated by multiplying remaining portions by grams per portion at the end of each mealtime. Number of meals was estimated using automated meal swipes to enter canteens. Linear regression compared the impact of the intervention across the three phases with amount of food produced included as a covariate in the model.

RESULTS
A total of 44,220 meals were purchased over the 9 weeks. The mean±SD daily meal purchases were 203±26, 297±57 and 364±6 for breakfast, lunch and dinner respectively. The mean quantity (kg) of foods selected per meal was 1287±1160, 4202±3812 and 3128±1847; and wasted was 99±129, 191±370 and 193±178 for breakfast, lunch and dinner respectively. The mean pulse enriched meals selected (kg/person/day) in weeks 4-6 was 2.9±1.0 which increased to 3.9±2.3 in weeks 7-9, $p<0.001$. Subsequently, pulse enriched meal waste reduced from 0.7±0.3 to 0.5±0.4 in weeks 4-6 and 7-9 respectively, $p<0.001$.

CONCLUSIONS
In this study, the Raising the Pulse intervention encouraged higher consumption of pulse enriched food and lowered food waste. Educational programs encouraging higher consumption of healthful and sustainable diets could mitigate food waste in university catering outlets.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_105

FOOD IRRADIATION: FOR FOOD PRESERVATION TOWARDS A REDUCTION OF POST-HARVEST LOSSES IN NIGERIA

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BACKGROUND AND OBJECTIVES
Postharvest losses were found to cause a loss of about 13 million metric tons of agricultural crops in Nigeria, especially tomato of which about 0.7 million metric tons were found lost annually. Resulting in annual loss of about 3.7 trillion and 72 billion Nigeria Naira, of agricultural produce and especially of tomato. Food irradiation offers a better method of food preservation compare to the commonly used conventional and primitive techniques, which though does not serve their replacement. This paper is a contributory information dissemination on the commercial usage of food irradiation for food preservation that may help to reduce postharvest losses of agricultural produce in Nigeria.

METHODS
Narrative literature review was carried out using relevant review and original articles, books, and documents obtained from searches in Google Scholar, PubMed, and Bibliographies of articles.

RESULTS
Food irradiation was used to preserved yam, water yam, onions, sesame seeds and other crops without reported toxic effect and changing of nutritional values. The only one irradiation facility available in Nigeria is Gamma Irradiation Facility operated on Co-60 radioactive source, and currently under laboratory use.

CONCLUSIONS
Putting the facility under commercial usage can help reducing postharvest losses of agricultural crops, thus strengthening food security for achieving sustainable development goal 2 (SDG 2) in Nigeria. Following the economic innovation through the technology in such countries as United states of America, Brazil, China, Japan, Malaysia and others, it may also stimulate, when aptly applied, agricultural productivity for gross domestic product (GDP), export and currency growth in Nigeria. It is therefore recommended, for quick commercial operation of food irradiation, that positively adequate education about the technique is disseminated among relevant stakeholders, and that government should establish more irradiation facilities at strategic areas in Nigeria for easy access by both farmers and marketers of perishable food crops, and interested individuals.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_106

OPPORTUNITIES AND NUTRITIONAL POTENTIAL OF SEAWEEDS IN PLANT-BASED MEAT ALTERNATIVES

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BACKGROUND AND OBJECTIVES
With the growing demand for sustainable food systems, seaweeds are emerging as functional food ingredients. Seaweeds are high in protein, polyunsaturated fatty acids, vitamins, iodine, dietary fiber, antioxidants, polysaccharides, minerals, and bioactive compounds. While they have been consumed worldwide, particularly in Asian countries, their potential as novel food ingredients is now being explored. This review examines the nutrient profile of seaweeds, factors affecting bioavailability, applications in alternative meat products, and associated challenges.

METHODS
A comprehensive review of scientific literature was conducted using databases such as PubMed, Scopus, and Google Scholar. Studies were included that evaluated the nutritional composition of seaweeds, their bioavailability, and their use in alternative meat products. Challenges and future prospects for use were also included.

RESULTS
Seaweeds demonstrate significant potential to enhance the technological, organoleptic, and nutritional properties of food products. Protein-rich seaweeds have been successfully incorporated into plant-based burgers, frankfurters, pâtés, sausages, etc showcasing their versatility as novel food ingredients. Seaweeds also function as salt substitutes in meat products, contributing to flavour and reduced sodium content. However, the bioavailability of key nutrients is influenced by factors such as polysaccharide structure and mineral-binding properties, requiring further investigation.

CONCLUSIONS
Seaweeds have great potential as sustainable, nutrient-dense ingredients for plant-based meat alternatives. While their incorporation can address both nutritional and functional goals, future research is essential to overcome challenges related to nutrient bioavailability to optimize their applications. Future research should focus on novel uses of seaweed ingredients to develop safe and environmentally friendly meat alternatives.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_107

THE EFFECTS OF SPIRULINA DOSAGE ON GLUCOSE METABOLISM, BLOOD PRESSURE, AND LIPID PROFILE: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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BACKGROUND AND OBJECTIVES
Spirulina, a microalga with a promising nutritional profile, has attracted significant interest from the scientific community, with numerous studies investigating its functional characteristics and potential impact on human health. Despite this, the effect of different doses of spirulina remains unclear. The objective of this systematic review and meta-analysis was to study the effects of the dosage of spirulina on glycemic control, blood pressure, and lipid profile.

METHODS
Randomized controlled trials (RCTs) were identified using PubMed, SCOPUS, and Google Scholar, and the search took place until September of 2023.

RESULTS
20 RCTs met the inclusion criteria and were included in this systematic review, of which 11 were included in the meta-analysis.

CONCLUSIONS
This meta-analysis uniquely evaluated the impact of spirulina supplementation on various biomarkers, in addition to examining the influence of different dosages. While our meta-analysis found a significant effect of spirulina on these biomarkers, the dosage meta-analysis did not show significant effects for any particular dose. This discrepancy can be attributed to several factors and highlights the need for further studies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_108

EPIDEMIC PREVENTION NUTRITION: STARTING WITH MY PLATE TO PROMOTE EMPLOYEE HEALTH THROUGH VIDEO LIVE STREAMING

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BACKGROUND AND OBJECTIVES
In response to the COVID-19 pandemic, nutrition care and meal services were adapted to support epidemic prevention and promote employee health. By leveraging public policy and digital tools, this initiative aimed to create a supportive nutritional environment and enhance remote health promotion. The project focused on adjusting employee meal boxes to be nutritious and health-promoting.

METHODS
1. **Digital Education**: Online videos and live streaming reduced group gathering risks while delivering health education.
2. **Interactive Learning**: A web-based quiz game was used to engage employees in an enjoyable way to acquire health knowledge.
3. **Educational Videos**: "My Healthy Plate" videos were integrated into employee meal boxes, helping staff understand portion control and balanced food choices.
4. **Surveys**: Online surveys via QR codes and Google Forms collected feedback from employees, which was then analyzed.

RESULTS
754 employees participated in the program. Survey RESULTS showed that 92% were satisfied with the course content and teaching methods, 91% had a clear understanding of the material, and 91% felt the course benefited their work. Employees also suggested adjusting the timing for quiz participation to enhance engagement.

CONCLUSIONS
This initiative, by digitizing nutrition education and promoting health via meal boxes, improved employee physical health, emotional well-being, and stress management, ultimately enhancing healthcare service quality and promoting long-term wellness.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_109

THE IMPACT OF AGRICULTURAL PRACTICES ON THE BIOCHEMICAL COMPOSITION OF INDIGENOUS GHANAIAN FOOD CROPS

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BACKGROUND AND OBJECTIVES

In Ghana, several farming practices – slash and burn, monoculture, traditional subsistence farming and mono-culture with heavy chemical inputs are employed to cultivate food consumed nationwide. However, these practices are drivers of biodiversity loss and have largely unexplored impacts on the biochemical composition of crops. These factors are vital to crop quality, influencing both their nutritional value and potential effects on consumer health. This study explores how these agricultural practices affect the composition of crops.

METHODS

Three indigenous Ghanaian food crops were sampled from multiple farms in the agrarian Techiman and Kintampo municipalities and analysed for their proximate, ionomic, metabolomic, and fatty acid profiles. Metadata on agricultural practices from each farm were also collected to contextualize the compositional data, to correlate farming practices to compositional data.

RESULTS

Full dataset not ready yet, but will be ready and presented at the congress.
Expected outcomes: That the relationship between dominant agricultural practices and crop composition be substantiated. Also, that practices associated with improved composition be identified. Conversely, practices that degrade soil health or compromise crop quality can be mitigated or avoided, ensuring the long-term sustainability and resilience of agricultural systems in Ghana.

CONCLUSIONS

N/A

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_110

ATTITUDES AND SUSTAINABILITY PERCEPTIONS OF DUTCH CONSUMERS TOWARDS MEAT ALTERNATIVES

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BACKGROUND AND OBJECTIVES
Over recent decades, meat has shifted from a status symbol of wealth to a daily staple, significantly impacting the environment, health, and animal welfare. This has prompted a growing move toward plant-based diets, with many adopting a flexitarian approach, focusing on reducing meat consumption. In response, the food industry has developed alternatives for animal-based proteins to meet this demand. The aim of this study was to examine consumer attitudes toward meat and plant-based alternatives, focusing on willingness to buy, sustainability, and naturalness, to identify factors influencing acceptance and market potential of meat alternatives.

METHODS
An online questionnaire was designed to explore the attitudes of Dutch consumers toward meat and meat alternatives. The survey consisted of four parts: in the first part participants answered questions about their grocery shopping behaviour and their health status. The second part included an online experiment in which participants evaluated their perceptions of eight products.: chicken, minced meat, burgers, sausages, and their plant-based counterparts. In the third part, participants were asked several questions about meat and meat alternatives to indicate their opinion on several statements about sustainability. In the final section, participants provided their demographic information. A total of 120 participants, recruited through Prolific, completed the questionnaire.

RESULTS
Participants showed a generally higher willingness to buy traditional meat products (e.g., chicken, minced meat, burgers, sausages) compared to their plant-based alternatives. However, for burgers, the willingness to buy is nearly identical for meat and meat alternatives, suggesting plant-based burgers may be more competitive and suggesting potential for greater acceptance. Plant-based alternatives were consistently rated as more sustainable than meat products across all categories, but meat products were generally rated as more natural than their plant-based counterparts.

CONCLUSIONS
While plant-based alternatives are viewed positively in terms of sustainability, they face challenges in terms of willingness to buy and perceived naturalness, where traditional meat still holds an advantage.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_111

FOOD SYSTEMS INNOVATION TO NURTURE EQUITY AND RESILIENCE: EXAMPLES FROM THE WORK OF THE CANADA RESEARCH CHAIRS ON NUTRITION AND HEALTH INEQUALITIES

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BACKGROUND AND OBJECTIVES
The concept of resilient food systems has gained increasing attention as a transformative framework aimed at addressing the vulnerabilities within the current food system. Resilience in food systems requires diversified strategies that ensure redundancy and stopgaps, allowing systems to adapt quickly to disruptions and prevent negative consequences to planetary and human health. Furthermore, for food systems to be resilient, they must also be equitable. The Canada Research Chair in Nutrition and Health Inequalities (CIENS) has been involved in several initiatives that investigate the link between traditional and alternative food systems and the health of humans, animals and the environment.

METHODS
Based on data from the First Nations Food, Nutrition and Environment Study in Canada, Ekomer-Redes in Ecuador and Utz K'aslemal in Guatemala, we explore the interactions between various disruptions to food systems and discuss potential responses to build resilience in the face of biodiversity collapse, climate change and political and security disruptions.

RESULTS
Food systems operate on a spectrum from local to global, and resilience is best achieved by linking and integrating these scales rather than treating them in isolation. Moreover, transformative food systems must go beyond individual actions in production and distribution to include a holistic view of the entire system, incorporating principles such as fairness, participation, and co-creation of knowledge, particularly through the lens of agroecology and the preservatiopn of traditional food resources for Indigenous people who traditionally relied and continue to favour hunting, fishing and gathering as a food source, such as for Indigenous Peoples in Canada. The importance of integrated approaches to human, animal, and environmental health reflects the interconnectedness of all elements within the food system for the adoption of integrated approaches to health and well-being (e.g., One Health, Planetary Health).

CONCLUSIONS
Achieving resilience requires collaboration across scales, sectors, and paradigms, with particular attention to equity and fairness. Agroecology and traditional land-based food systems offer valuable guiding principles for transforming dominant food systems, while integrated health frameworks provide a useful lens for understanding the broader implications of food system changes to face multiple crises globally.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_112

ACCEPTANCE OF INSECTS AS FOOD: CAN THEY CRAWL ONTO POLISH PLATES?

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BACKGROUND AND OBJECTIVES
Edible insects are a sustainable alternative to conventional animal protein, offering significant environmental benefits. Compared to beef, insect farming has a lower water footprint, requires less land, and has a production cycle spanning only weeks. Furthermore, insects convert up to 88% of dietary protein into edible body mass and provide a nutritional density comparable to meat. Despite these advantages, public acceptance of edible insects remains a major challenge.

METHODS
This cross-sectional online study surveyed adult Poles (n=1553) to assess their familiarity with edible insects, their willingness to purchase them, and factors influencing these attitudes.

RESULTS
The vast majority of respondents (98%) were familiar with entomophagy; however, only 28% expressed a willingness to buy insects as food. The primary barriers were disgust (60%) and concerns over sensory properties (34%). Those willing to try insects were motivated mainly by curiosity (76%) and the perceived lower environmental impacts (61%). Ground insects (73%) and insect-based food products (77%) were preferred, while only 27% were open to consuming whole insects. Multiple logistic regression analysis revealed that the likelihood of rejecting edible insects was significantly higher among females (OR: 2.42; 95%: 1.61-3.65) and individuals with low openness to novel experience (1.57; 1.13-2.18). In contrast, respondents who acknowledged the adverse environmental effects of animal farming, such as impacts on air quality (OR: 0.42; 95% CI: 0.19–0.95) and water resources (OR: 0.30; 95% CI: 0.13–0.70), were less likely to reject edible insects.

CONCLUSIONS
Acceptance of edible insects as food in Poland is low but could improve with targeted information campaigns emphasizing their environmental benefits. To reduce disgust-related barriers, edible insects should be offered in ground form and incorporated into food products rather than presented whole.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_113

MONITORING THE PROTEIN INTAKE IN A BELGIAN CITY

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BACKGROUND AND OBJECTIVES

Policy measures are implemented to promote a shift away from animal-source foods in favor of plant-based foods. In Belgium the proportion of animal-to-plant protein in the diet was 61% to 39% in 2014. The protein shift encourages a modification towards 60% from plant and 40% from animal. An efficient and accurate measurement of the protein consumption is important to monitor progress and guide policies.

METHODS

A Food Frequency Questionnaire (FFQ), developed by the Belgian public health institute, was used to measure the consumption of both animal- and plant-based protein sources in the population of a city with a long-standing urban food policy and protein strategy. The FFQ was developed so that at least 90% of the protein intake would be measured. Novel food categories that could contribute to the protein supply, e.g. plant-based meat and dairy alternatives or pulse-based foods (e.g. pasta) were added to the FFQ.

RESULTS

In total, 500 adults completed the online questionnaire in the period of May – June 2024. The sample was stratified by gender and age to ensure it was representative of the city's population. Upon removal of extreme responses, 456 respondents remained. The sample consisted of 61.5% omnivores, 36.8% flexitarians (i.e. people who don’t consume meat or fish at least one day a week, as derived by FFQ responses), 1.5% vegetarians (n=7) and 0.2% vegans (n=1). Overall, on average 51.4% of the protein intake was supplied by animal sources and 48.6% by plant sources. In flexitarians, the proportion of plant-to-animal source proteins were 56% and 44% respectively, while in omnivores this was 42% and 58%. Most important food groups in terms of protein intake were meat and meat products (26.7%), grains and grain products (26.7%), milk and dairy products (16.3%), fish and seafood (5.8%), while plant-based alternatives to meat and dairy supplied <5% of protein in the total population.

CONCLUSIONS

A shift in the frequency of consumption of animal products, such as meat, fish, eggs and dairy, as compared to the Belgian population, was clearly visible in this city. Flexitarians are an important driver for the protein transition here. Further analyses will assess whether this dietary profile is associated with the urbanised context or with the specific policy situation of this city.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_114

ASSESSMENT OF THE ESTIMATED INTAKE OF PESTICIDE RESIDUES IN FOODS OFFERED IN INSTITUTIONAL MENUS

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BACKGROUND AND OBJECTIVES
This study aimed to evaluate the estimated intake of pesticides through food provided in institutional food services in Brazil, which is based on the use of minimally processed and in *natura* foods, with few ultra-processed. The conventional agricultural production model in Brazil uses large amounts of pesticides, which can pose chronic toxicity risks, thus harming public health.

METHODS
The methodology for estimating pesticide intake through food, as outlined by the World Health Organization (WHO), was employed using the calculation of the Theoretical Maximum Daily Intake (TMDI), considering the Brazilian Maximum Residue Limits (MRL) for foods and the quantities consumed in institutional restaurant menus. The per capita food quantities offered in the menus were obtained from the preparation technical sheets. The percentage contribution of the Acceptable Daily Intake (ADI) was assessed by considering the estimated intake and a body weight of 60kg. A comparative analysis between the intake levels and the ADI of the respective active ingredient enabled the assessment of exposure risk. The study considered breakfast, lunch, and dinner meals, with MRL data for plant-based foods collected from the National Health Surveillance Agency, and for animal-based foods from the Codex Alimentarius database. Fourteen pesticide active ingredients were evaluated, including glyphosate, 2,4-D, abamectin, mancozeb, chlorpyrifos, acephate, methomyl, cypermethrin, bifenthrin, novaluron, lambda-cyhalothrin, tebuconazole, paraquat, and chlorothalonil. The foods analyzed included coffee, corn, banana, carrot, potato, tomato, rice, beans, grapes, eggs, milk, beef, and poultry.

RESULTS
The daily estimated intake of pesticide residues, considering breakfast, lunch, and dinner, revealed that TMDI >100% of the ADI for novaluron and mancozeb, assessing unacceptable risk. The active ingredients bifenthrin and chlorothalonil reached 95% and 76% of the acceptable daily intake, respectively, indicating health risks. It is noteworthy that only during lunch was an unacceptable exposure risk identified for the pesticides novaluron and mancozeb, with estimated daily intake surpassing the ADI (>100%).

CONCLUSIONS
The RESULTS showed that conventionally produced foods in Brazil are exposed to a range of pesticide active ingredients throughout their production chain. The study underscores the chronic risks of pesticide exposure and highlights the importance of quality food in promoting health and upholding the human right to adequate nutrition.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_116

NUTRITIONAL TRANSITION AND ENVIRONMENTAL SUSTAINABILITY: THE DIVERGENCE BETWEEN NORTHERN AND SOUTHERN MEXICO

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BACKGROUND AND OBJECTIVES
Mexico is currently grappling with a severe environmental crisis, marked by a water scarcity that affects 85% of the territory and frequent droughts. This crisis is intricately linked to the nutritional transition, a shift from the traditional Mexican diet, rich in local products like corn and beans, to a Western diet. This transition has propelled Mexico to the top of the global charts for overweight and obesity and has also contributed to the country's substantial water and carbon footprints, averaging over 8,000 (l p–1 d–1) and 3.9 kg of CO2 per person per day. The nutritional transition has unevenly impacted the different regions of Mexico. In the northern states, greater progress is observed in this transition, while in the south, a diet more attached to the milpa tradition persists. A comparative study was conducted between Chihuahua, representing the north, and Oaxaca, representing the south, focusing on the impact of diets on the water footprint (WF) and carbon footprint (CF).

METHODS
A study of 84 adults (42 from Chihuahua and 42 from Oaxaca) assessed dietary patterns and environmental impacts using validated tools. Carbon and water footprints were calculated with LCA and WFA methods adapted to Mexico. Adjustments for food preparation were included, and statistical analyses used Stata 12.0.

RESULTS
The RESULTS showed similar dietary patterns in both states, with key differences. In Chihuahua, higher consumption of meat (136.1 g/d) and ultra-processed foods (165.6 g/d) was observed, while in Oaxaca, the consumption of traditional Mexican dishes (302.4 g/d) and low consumption of meat (19.3 g/d) predominated. In terms of environmental impact, the water footprint was 7,318.4 l p–1 d–1 in Chihuahua and 6,127.5 l p–1 d–1 in Oaxaca, with meat and Mexican dishes being the main contributors, respectively. Carbon footprints were 8.67 kg CO2 p–1 d–1 in Chihuahua and 6.64 kg CO2 p–1 d–1 in Oaxaca, with no significant differences between states.

CONCLUSIONS
Although the study did not find statistically significant differences between the states, the RESULTS underscore the significant impact of the nutritional transition. An increased consumption of meat and ultra-processed foods in North Mexico has a considerable environmental impact. In contrast, Oaxaca's diet, rooted in traditional products, is more sustainable. This stark contrast in environmental impact should serve as a wake-up call to the gravity of the situation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_117

NUTRITIONAL VALUE OF EUROPEAN FLAT OYSTER (OSTREA EDULIS)

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BACKGROUND AND OBJECTIVES
Among shellfish, the European flat oyster has long been known as a delicacy, and currently is the only oyster species native to Europe. Due to the spread of disease in the past century, native *Ostrea edulis* has largely been replaced by Pacific oyster. However, in the last years, renewed efforts have been made to reintroduce *O. edulis* along the European coast. With growing interest in its importance, this review aims to gather current knowledge on the nutritional properties of the European flat oyster.

METHODS
The comprehensive literature review was performed using Scopus database. The following keywords were used in the search: "European oyster", "Ostrea edulis", "nutritional", "biochemical", "composition", "fatty acid", "vitamin", and "mineral". In total, 150 studies were obtained. After screening and filtering, 16 scientific papers were reviewed, which involved studies from countries across Europe.

RESULTS
The literature review revealed significant differences in biochemical composition due to changes in environmental conditions, reproductive cycle, food quality or rearing conditions. Proteins were shown to be the main components of *O. edulis* (35.0 – 68.0 % dry weight, or 6.9 – 11.0 g/100 g), followed by carbohydrates (16.8 – 46.9 % dry weight, or 1.5 – 9.2 g/100 g) and fats (3.3 – 10.9 % dry weight, or 1.2 – 5.5 g/100 g). Studies on the fatty acid composition have produced mixed RESULTS with some reporting the highest proportion of saturated fatty acids (SFA) and others reporting the highest proportion of polyunsaturated fatty acids (PUFA). However, palmitic acid is considered the most abundant SFA, while EPA and DHA are the most present PUFAs. The lipid nutritional quality indices indicate that *O. edulis* may have a positive impact on consumer health. None of the studies investigated vitamins, and only a couple investigated mineral content.

CONCLUSIONS
The findings from this comprehensive review suggest that European flat oyster could be considered as a highly nutritious food contributing to healthy diet, with a high content of protein, omega-3 fatty acids and minerals, and a low content of total fat. It is worth to be more investigated in the future since the European Union recognizes bivalve aquaculture as part of sustainable food systems due to its low environmental impact.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_118

SUBSTITUTING CERTAIN ANIMAL-SOURCED FOODS WITH NOVEL PLANT-BASED ALTERNATIVES MAINTAIN NUTRITIONAL OUTCOMES AND LOWER ENVIRONMENTAL IMPACTS IN DIETS

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BACKGROUND AND OBJECTIVES
Growing literature suggests dietary shifts from animal-sourced to plant-based foods. While the United Kingdom's (UK) meat and dairy consumption has decreased, further efforts are required to meet national environmental and health targets. Although novel plant-based foods (NPBFs) offer easy meat and dairy replacement without sacrificing sensory experience, their impact on health, the environment and cost remains uncertain. This study aimed to identify the potential trade-offs and co-benefits of substituting specific animal-sourced foods with comparable NPBFs in a UK healthy and affordable "basic basket" (baseline) for men and women.

METHODS
Nine new baskets were created to assess the nutritional, environmental and cost outcomes by substituting processed meat, milk or yogurt with the most consumed, healthiest, and affordable NPBFs. Food products from the basic basket were matched with the UK food composition table. NPBFs nutritional data were collected from UK supermarkets in 2023, using the Open Food Facts app. All foods were matched with dietary environmental footprints (greenhouse gas emissions, water and land use) from Clark et al. 2022, and prices were manually collected from UK supermarkets in 2023.

RESULTS
Dietary environmental footprints decreased by -0.39 to -6.94% in all new baskets. While nutritional outcomes varied between the basic and new baskets, most substitutions aligned with recommended daily allowance. When carefully selected, minimal nutrient changes were found—especially with the "healthiest" NPBFs—though important micronutrient reductions occurred when replacing milk with the most affordable alternative. Nearly all dairy alternatives substitutions lowered food basket costs, while the most consumed plant-based drink and all plant-based meats were more expensive.

CONCLUSIONS
If carefully selected, NPBFs present a powerful opportunity for health and environmental benefits, especially as replacements of processed meats. However, without policies to make NPBFs more affordable, this would represent a missed opportunity to drive progress towards net zero and health targets.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_122

PROMOTING HEALTH AND SUSTAINABILITY IN FOOD SERVICES: A BRAZILIAN PERSPECTIVE ON NUTRITIONISTS' PRACTICES

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BACKGROUND AND OBJECTIVES
The study examined how nutritionists in food services adopt sustainable practices to contribute to Sustainable Development Goal (SDG3) on health and well-being. Two significant challenges in food service are: 1) Inadequately planned menus that fail to provide nutritionally balanced meals, hindering the prevention of chronic diseases; and 2) the neglect of worker health and safety, a critical oversight that compromises the well-being of a vital workforce.

METHODS
A validated questionnaire was used for the investigation, addressing the following factors: a) knowledge about sustainability (using a dichotomous scale) b) food quality, c) the health and well-being of foodservice workers, and d) health risk behaviors among these workers (using a Likert scale to measure the frequency of practice adoption - never, rarely, occasionally, frequently and very frequently). The study received ethical approval for research involving human subjects. A convenience sample (n=105) of nutritionists was recruited for this exploratory study. Participants were required to work or have worked in the foodservice sector to be included in the data analysis.

RESULTS
Key findings revealed that, regarding knowledge of sustainability, 52% of nutritionists reported promoting actions to achieve SDG 3. Regarding the dimension of health and food quality, the most nutritionists (85%) offer red meat in their menus, while 80% also reported diversifying sources of animal and plant-based protein. Additionally, 83% of nutritionists mentioned planning their menus considering seasonality, and only 17% referred to using ultra-processed food. The RESULTS showed that slightly more than half of the nutritionists (55%) control the use of critical nutrients (sugar, sodium, and oil). In terms of the health and well-being of workers in food services, only 36% of nutritionists assess the nutritional status of their workers; 74% provide personal protective equipment; 49% develop strategies to encourage teamwork; 69% promote effective communication within the team; and 45% manage environmental risks. In assessing health risk behaviors among foodservice workers, nutritionists identified factors such as low consumption of fruits and vegetables (39%), sedentary lifestyle (53%), stress (67%), hypertension (55%), and dyslipidemia (46%) as risks.

CONCLUSIONS
The RESULTS highlight the need for integrated efforts among nutritionists, health professionals, and occupational health experts to promote sustainable practices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_123

HARNESSING COMMUNITY-BASED SOCIAL AND BEHAVIOR CHANGE GROUPS TO ENHANCE FOOD AND NUTRITION SECURITY THROUGH INTEGRATED PROMOTION OF NUTRITION AND CLIMATE-SMART AGRICULTURE IN ZIMBABWE

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BACKGROUND AND OBJECTIVES
Takunda, a resilience and food security project in Zimbabwe, seeks to enhance nutrition status of women and children, increase incomes and build resilience against shocks through innovative community-based interventions.

METHODS
Takunda leverages use of Social and Behavior Change (SBC) groups, like Care Groups (CG), Farmer Field and Business Schools (FFBS) and Village Savings and Loan Associations (VSLAs) to deliver layered and integrated interventions. SBC activities delivered through these groups use various communication channels to promote dietary diversity using locally produced foods FFBS integrates nutrition promotion into agricultural training, influencing farmers' selection of crops to grow and production methodologies in view of changing climate. CGs use edutainment, storytelling and cooking demonstrations to promote dietary diversification. In addition, CG participants are encouraged to participate in VSLAs and Income Generating Activities (IGAs) to diversify their income sources.

RESULTS
As a result of these interventions, nutrition outcomes have improved. Households with acceptable dietary diversity rose from 50% in 2022 to 74% in 2024, demonstrating increased economic access to a variety of nutritious foods despite the El Niño-induced drought. Similarly, women in Care Groups had an increase in dietary diversity from 19% in 2022 to 56% in 2024. At the same time the dietary diversity of children aged 6-23 months rose, with the proportion consuming Minimum Dietary Diversity (MDD) increasing from 38% in 2022 to 55% in 2024. Income diversification through small livestock and entrepreneurial activities provided additional financial security. Over 570,198 poultry were produced and generated cumulative sales of USD 1.74 million. This contributed to an average household income of USD 210 from poultry sales, supporting dietary diversity and adaptive capacity. The program supported development of 93 nutrition gardens producing vegetables such as green leafy vegetables, butternut and carrots on 58.8 hectares, generating USD 229,211 in gross revenue while also improving community dietary diversity.

CONCLUSIONS
By leveraging SBC activities through community established groups like Care Groups, FFBS and VSLA the project enhanced dietary diversity, food security, and resilience in the target population.

CONFLICTS OF INTERESTS
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EPO2_124

SUSTAINABLE EATING MADE EASY? A COMPARATIVE ANALYSIS OF THE NUTRITIONAL AND ENVIRONMENTAL FOOTPRINT OF READY-MEALS AND HOME-COOKED MEALS

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BACKGROUND AND OBJECTIVES

Young women aged 18–24 years are a key demographic for studying plant-based dietary patterns due to their inclination toward plant-based convenience foods, risk of iron deficiency, and role as future influencers of household dietary habits. Ready meals are popular due to convenience, but their nutritional quality and alignment with sustainability goals remain unclear. This calls for a deeper understanding of whether plant-based ready meals offer better nutritional quality and environmental sustainability compared to meat-containing ready meals and home-cooked options. The objective of this study was (i) to assess greenhouse gas (GHG) emissions and nutritional profiles (ii) to examine ingredient quality (using price as a proxy) to guide young women toward informed, sustainable choices.

METHODS

The ten most frequently purchased plant-based ready meals among households including at least one woman aged 18–24 were identified from Kantar WorldPanel data (05/2017 to 04/2021) and categorised into low, medium, and high-cost alternatives. Ready meals were prepared using packaging instructions, analysed for multi-elemental content (ICP-MS), and macronutrients quantified from back-of-pack information. Equivalent home-cooked meals, using low- and high-cost ingredients, were similarly analysed using ICP-MS and Nutritics software. GHG emissions were calculated based on estimated ingredient quantities and cooking processes to assess whether switching to convenient plant-based ready meals can be a sustainable dietary option for young women.

RESULTS

The most purchased ready meals were margherita and vegetable pizzas, macaroni cheese, cheese and tomato pasta, vegetarian tikka masala with rice, vegetable chilli with rice, vegetarian lasagne, vegetable biryani, mushroom risotto, and cottage pie, accounting for ~19% of ready meal purchases among the study population. Findings are expected to highlight trade-offs between adequate nutrition, convenience, and sustainability with the analysis to be completed by May 2025.

CONCLUSIONS

This analysis will provide information on whether ready meals can serve as a sustainable and nutritious choice for young women seeking convenient foods. Our findings will be used to inform consumers and policymakers, including Food Standards Scotland (FSS), about the trade-offs between plant-based ready meals, meat-based ready meals and home cooking. Through an artist co-op, we will create visual outputs to communicate trade-offs, making findings accessible for guiding sustainable and nutritious dietary strategies.

CONFLICTS OF INTERESTS

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EPO2_126

UNIVERSITY BASED ROOFTOP URBAN AGRICULTURE FOR SUSTAINABLE LIVELIHOODS (SL) AND SUSTAINABLE FOOD SYSTEMS (SFS): A CASE STUDY FROM AN IMPLEMENTATION SCIENCE IN NUTRITION (ISN) PERSPECTIVE

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BACKGROUND AND OBJECTIVES
The role of urban agriculture in general, and rooftop urban agriculture in particular, has demonstrated potential to contribute to more socially, ecologically and economically SFS and SL outcomes, including food and nutrition security and a more sustainable use of the natural resource base. Anchor institutions such as Universities play a key role in their communities, including reducing opportunity costs associated with experimentation for less well resourced organizations, while simultaneously providing educational, research and employment opportunities. The history and activities of a university based Urban Farm Living Lab (UFLL), located in the downtown core of a capital city, will be explored from an ISN perspective.

METHODS
ISN aims to bridge the gap between knowledge and action by systematically considering five domains proven to impact implementation. Specifically, the intervention, implementing organization, enabling environment, communities of interest and strategies and decision making processes were considered. The case study conducted a systematic review of records, reports and documentation, in consultation with, and verified by, the UFLL team, key stakeholders and champions.

RESULTS
The intervention included two rooftop growing spaces, one retrofitted, and one purpose built for food growing. The UFLL facilitated experiential learning and research. On-campus food growing at the University (implementing organization) was initiated by students, provided with academic leadership from a University based research centre with additional human, physical and financial capital support from University administration and donors. Human and social capital of community engaged scholars facilitated engagement with community and governmental organizations (enabling environment), as did policy (Green Roof bylaw and Urban Agriculture Plan), and existing and emerging organizations (Black Food Sovereignty, Indigenous Education, Food Policy and Urban Growers). Communities of interest benefitted from food production, including pandemic related emergency food distribution, ecological services (stormwater and heat island effect mitigation) and social justice initiatives addressing historical AntiBlack and Indigenous racism. Strategies and decision making processes shifted as the initiative became embedded into university business services.

CONCLUSIONS
This case study demonstrates the potential of anchor institutions, supported by a range of sustainable livelihood assets and transforming structures, to contribute to SL and SFS.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_127

BIOINTENSIVE BACKYARD PRODUCTION, A STRATEGY TO ACHIEVE FOOD SOVEREIGNTY IN THE MAZAHUA REGION OF THE STATE OF MEXICO

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BACKGROUND AND OBJECTIVES
The current panorama of food security and the nutritional status of the Mexican population shows a reality of contrasts; the food supply is exceeded by demand, which limits access to nutritious food and creates a serious food security problem. The magnitude of this problem highlights the need to create biointensive production interventions to increase the availability and access to food. Our objective was to increase the availability of low-cost food in 30 Mazahua households in the State of Mexico that contribute to adequate food and nutrition.

METHODS
Participatory workshops on the biointensive production method and focus groups with 30 commissioners were facilitated. Production records were filled out to calculate the savings and family income produced.

RESULTS
A total of 5.4 tons of vegetables were produced in the 30 households. The main types produced were kale (33%), chard (31%), romaine lettuce (17%), and beetroot (6.3%). 33.5% of the production was for self-consumption and 46.5% for sale, generating an average monthly savings and income per household of 14.90 USD and 18.82 USD, respectively.

CONCLUSIONS
The RESULTS show that the biointensive method effectively contributes to food security and sovereignty by making available a greater variety of foods in quantity and quality. It may also be capable of generating additional family income that contributes to improving the quality of life of families.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_128

THE PROMOTION OF THE UTILIZATION OF INDIGENOUS FOODS' FRAMEWORK

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BACKGROUND AND OBJECTIVES
Indigenous plants grow naturally in the ecosystems and have been used by many generations as food and medicine in almost all societies. These foods and dietary diversity within an ecosystem are recognised as powerful sources of nutrients and are therefore more beneficial to health. This paper aims to present a validated framework for the promotion of the utilization of indigenous foods.

METHODS
Participatory action research was employed to engage participants when collaborating to understand social issues and identification of actions to bring about social change. The design logic model was informed by Theoretical Domain Framework delimiting to the four theoretical domains of knowledge, skills, environmental context and resources, and behavioural regulation). Key stakeholders, researchers, and experts were involved in consensus workshops which modelled the necessary activities and components as synthesized from the systematic review, quantitative and qualitative data, during designing of the Framework for the Promotion of the Utilization of Indigenous Foods. Modified Delphi Validation techniques included expert evaluation using evaluation questionnaires and focus group discussions with stakeholders. The framework is thought to be a practical and valuable artifact for the promotion of the utilisation of indigenous foods.

RESULTS
The validated framework suggests that major players—government officials, businesses, academic institutions, research institutes, communities, and the media—could cooperate to guarantee that indigenous foods are accessible and available to the communities. While the end users—communities, farmers, merchants, schoolchildren, patients, and prisoners— must promote the utilisation of these foods by consuming them. The framework also proposes that knowledge holders such as parents, elders, and women transmit indigenous food knowledge, harvesting, processing, preservation, and preparation skills to the younger generation.

CONCLUSIONS
The validated framework proposes that the promotion of the utilization of indigenous foods to improve health should include different stakeholders. The framework is targeted to those who have the power to implement it in their respective positions, with consequent goals of contributing to sustainable goals 1, 2, 3 and 12 of the United Nations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_129

EXPLORING THE LINKS BETWEEN ATTITUDES AND BEHAVIOURS CONCERNING FOOD USE AND WASTE WITHIN SCOTLAND – PERSPECTIVES ON RURALITY

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BACKGROUND AND OBJECTIVES
Food waste contributes 8-10% of global greenhouse gas emissions. In the UK, 61% of food waste is derived from households, costing ~£600 annually (1). Food habits, including waste, are influenced by identity, culture, and perceived norms (2). This study aimed to examine the role of rurality on food-related behaviours and intentions.

METHODS
We performed a secondary analysis of a cross-sectional survey of UK adults conducted in 2021, exploring food system understanding and diet in the context of both health and the environment. Food-related behaviours (n=9) and intentions (n=7) and the importance of sustainability when making food choices (n=1) were assessed using 7-point Likert scales. Cumulative scores for behaviours and intentions were calculated and transformed into percentages of the maximum possible score. Urban/rural classification was determined based on home postcode, using Office for National Statistics and Scottish Government classifications.

RESULTS
Respondents (n=297, 78% female) predominantly lived in urban areas (n=245, 82%) with a large median age difference between the rural group (64, IQR 29) and the urban group (36, IQR 30), $p<0.001$. Rural participants indicated buying seasonally (19% often/always for rural, 16% for urban $p=0.001$), local produce (58% often/always vs 31%, $p=0.027$) and eating leftovers (69% often/always vs 51% $p=0.008$) more frequently than urban participants. When making food choices, more rural participants agreed that sustainability was an important or very important consideration (46% for rural vs. 32% for urban, $p=0.001$). A greater proportion of rural participants reported already reducing consumption of animal products (38% vs 20%, $p=0.005$), acting to reduce food waste (65% vs 29%, $p<0.001$), limiting purchases in plastic packaging (35% vs 18%, $p=0.007$), buying locally (33% vs 15%, $p=0.002$) and seasonally (40% vs 16%, $p<0.001$), and purchasing animal products with higher production standards (37% vs 22%, $p=0.027$). Composite scores for pro-environmental behaviours and intentions were greater for the rural group (64% for behaviour, 78% for intentions) than the urban group (60% for behaviour, 67% for intentions). However, both groups had a significant intention-behaviour gap ($p<0.001$).

CONCLUSIONS
Rurality was associated with higher pro-environmental food-related behaviours and intentions, with an intention-behaviour gap highlighting opportunities to support both rural and urban residents in a place-specific fashion.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_131

IMPROVING FOOD SUSTAINABILITY AND NUTRITION THROUGH PROMOTION OF A SIMPLE SOLAR FOOD DRYER IN A COMMUNITY BASED INTEGRATED NUTRITION AND FOOD SECURITY PROGRAM IN BANGLADESH, KENYA, SOMALIA AND TANZANIA

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BACKGROUND AND OBJECTIVES

The Realizing Gender Equality, Attitudinal Change and Transformative Systems in Nutrition (REACTS-IN) program is a seven-year, multi-country program that aims to improve nutrition and gender equality for the most vulnerable women, adolescent girls, and children under 5 years of age. The project builds on previous impact achieved through ENRICH program in three countries, Bangladesh, Kenya, and Tanzania, and will aim to create impact in one new country, Somalia. The project is receiving $41 million from the Government of Canada, with World Vision Canada (WVC) contributing $3 million to the program.

METHODS

Solar food dryers offer a simple and cost-effective method of food preservation, preventing spoilage, fermentation, and contamination. The dehydration process also yields beneficial to reducing contamination by dust, insects, and other animals. They operate by harnessing passive solar heating, making them energy-efficient and environmentally friendly. The REACTS-IN program promoted a simple solar dryer made out of local materials such as card boxes, clear plastic sheet, and baskets made from split bamboo.

RESULTS

The technology was highly accepted by communities in the project target areas across the participating countries. The project identified early adopters to raise awareness about solar dryers and demonstrated how to construct them using locally available materials. These early adopters transferred their knowledge and skills to other community members, showcasing the cost-effectiveness and energy efficiency of the solar dryers, which help retain more nutrients in dried foods. The solar food dryers were found to be effective for drying fruits, vegetables, herbs, grains, and meat. However, in Somalia, adoption was slower as the project was implemented in Internally Displaced Persons (IDP) camps, where people primarily rely on food distribution rather than growing their own food. The dried foods were used as snacks for children, enhancing their nutrition and overall health. Women were also encouraged to sell the dried foods, contributing to increased household income and promoting economic empowerment and decision-making power.

CONCLUSIONS

Simple solar dryers contribute to global efforts in reducing food waste, mitigating climate change, and achieving the United Nations Sustainable Development Goals related to food security, sustainability, and climate action. Supportive policies and regulations are needed to increase adoption of solar food drying technologies.

CONFLICTS OF INTERESTS

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EPO2_132

UNDERSTANDING AND MITIGATING HOUSEHOLD FOOD WASTE: A MIXED-METHODS APPROACH TO BEHAVIORAL CHANGE

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BACKGROUND AND OBJECTIVES
Food waste poses a critical challenge to global food system sustainability, with profound implications for food security, environmental degradation, and economic stability. Although losses occur at all supply chain stages, households in high- and middle-income economies are a major contributor to post-production food waste, accounting for 40–60% of total discards (FAO, 2019; UNEP, 2021). This study investigated the determinants of household food waste generation and assessed the efficacy of an intervention developed from these insights.

METHODS
A mixed-methods approach was employed across three phases:Phase 1: Households (n = 382) completed structured questionnaires to assess food waste practices, sociodemographic characteristics (e.g., age, income, education), and behavioral determinants.Phase 2: A stratified subset (n = 13) exhibiting sociodemographic predictors of high food waste behavior (FWB) participated in semi-structured interviews and 7-day waste diaries (documented via diaries and photography).Intervention: Insights from Phase 2 informed the development of tailored educational materials addressing key drivers (e.g., meal planning, portion sizing, storage techniques). Participants received training using these materials, and behavioral outcomes were evaluated through post-intervention waste diaries.

RESULTS
Higher Food Waste Behavior (FWB) scores were significantly associated with younger age (19–29 years), male sex, higher education attainment, employment, single marital status, income levels of 6500–7499 Turkish Liras, and households with one female ($p<0.05$). Intentions to reduce food waste were positively influenced by personal and environmental attitudes, perceived behavioral control, guilt, and recycling practices, whereas food safety concerns exhibited a negative impact on these intentions ($p<0.05$). The primary contributors to food waste included excessive portion sizes, food spoilage, and prolonged storage, with vegetables, fruits, leftovers, and bread identified as the most frequently wasted items. Post-intervention, the frequency of food waste decreased by 26.5%, and the total quantity of wasted food declined by 40.7%.

CONCLUSIONS
Household food waste behavior is shaped by multidimensional determinants, necessitating context-specific interventions across regional and national scales. Integrated approaches targeting behavioral, knowledge-based, and systemic barriers can enable effective mitigation of food waste and advance food system sustainability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_133

DAIRY CONSUMERS' READINESS TO ADOPT MILK PRODUCTS WITH IMPROVED NUTRITIONAL QUALITIES AND SUSTAINABILITY

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BACKGROUND AND OBJECTIVES
Dairy intake offers nutritional benefits but also raises environmental and ethical concerns. Altering cows' diets is a potential strategy for improving animal health and productivity, thereby reducing the environmental burden whilst enhancing milk's nutritional qualities. This study examined consumer willingness to buy such improved milk products.

METHODS
Participants were recruited at community venues in Ayrshire and Glasgow. Habitual dairy purchasing and intake were assessed using a dairy-specific FFQ. Agreement with statements (n=5) related to sustainability and healthfulness of own diets, and the influence of diet on the environment were assessed using 5-point Likert scales (strong disagree to strong agree). We presented bottle packaging (n=4) providing different information about milk production and nutrition to participants, who ranked purchasing likelihood and factors (n=6) affecting their choices. Product A featured local production and omega-3 content, Product B featured "better for the planet" and "happy healthy cows" statements, natural enrichement with omega-3. Product C had no specific claims. Product D featured "happy healthy cows", enriched with omega-3, local production, fair trade standards, biodiversity protection, reduced methane emissions, and a novel quality assurance logo. A placebo taste test presented participants with four samples of the same milk, labelled to match the different packaging. Participants re-ranked the products from most to least likely to purchase, and were asked how much they would be willing to pay for each product compared to Product C.

RESULTS
Participants (n=26, 50% women, median age 54, IQR 25) had a median dairy intake of 3.7 portions per day (IQR 1.9-5.7), with 54% perceiving to consume a healthy diet, and 31% for sustainable diet. Although most participants (85%) agreed that food choices affect the environment, only 31% agreed that we should consume less dairy for the sake of the environment. Based on packaging, most ranked Product D first (77%) and Product C last (81%). After tasting, 42% selected product D first and 51% ranked Product C last (p=0.234, p=0.05 compared to pre-tasting), with participants willing to pay 15p (IQR 0-30p) more for Product D compared to C. Improved animal welfare was ranked most important (median 2, IQR 1-3), followed by fair trade standards (3 IQR 2-5), local production (3.5 IQR 2-5), environmental impact (4 IQR 3-5) nutrition (4 IQR 2-5) and quality assurance (5 IQR 3-6).

CONCLUSIONS
Participants would be willing to pay more for improved cows' milk, with statements about animal welfare being a critical factor.

CONFLICTS OF INTERESTS
H. Bracey: is the recipient of a studentship part funded by Valorex and ForFarmers UK Ltd.E. Combet: has received funding for research from the Alpro Foundation (plant-based diet), Valorex and ForFarmers UK Ltd (dairy), and has collaborated with Seaweed&Co and Napiers (iodine, seaweed research).S. Gray: has received funding for research from Aker Biomarine and Kappa Bioscience

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EPO2_134

EFFECTIVENESS OF "EPIDAURE MARKET": A GAME-BASED INTERVENTION TO TEACH NUTRITION IN MIDDLE SCHOOL

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BACKGROUND AND OBJECTIVES

Nutrition plays a crucial role in the overall health of populations. However, adolescents often adopt maladaptive dietary behaviors, which can shape their future eating habits. We developed a serious game intervention called **"Epidaure Market"**, a virtual supermarket designed to increase motivation for sustainable food choices (Lecêtre & al, 2024). The intervention consists of three school-based sessions, featuring interactive and engaging activities. This pilot study aims to evaluate the effectiveness of the intervention on adolescents' self-reported food choice motivations.

METHODS

A total of 583 middle school students (24 classes) from the Hérault region in France participated in the study. Twelve classes were assigned to the experimental group and twelve to the control group (which did not receive the intervention). Several factors were evaluated, including food choice motives, nutritional knowledge and skills, perceived social norms, outcome expectations, and self-efficacy. A cluster randomized controlled trial was conducted with three evaluation points: T0 (pre-intervention), T1 (1 month post-intervention), and T2 (4 to 6 months post-intervention).

RESULTS

Mixed-effects models were used, controlling for socio-demographic variables and class effects (clusters). The intervention was effective in improving adolescents' skills ($p < .001$), influencing their sustainable (i.e. including health, local and seasonal products, environmental impact, and ethics) motivations ($p < .05$), and increasing local and seasonal food motivation one month post-intervention ($p < .05$).

CONCLUSIONS

This intervention based on a serious game shows promising RESULTS in promoting sustainable motivations, particularly regarding local and seasonal aspects. However, limitations were observed concerning health-related outcomes, which will be discussed to refine and improve the intervention. A transferability study with the Academy of Dijon (France), a more rural area, is currently underway (Curnier et al., 2024). The preliminary RESULTS can be discussed in light of those already obtained.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_135

THE INFLUENCE OF GENETIC AND BIOCHEMICAL DIVERSITY OF FOOD CROPS ON CLIMATE RESILIENCE, SUSTAINABILITY, AND NUTRITION

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BACKGROUND AND OBJECTIVES
Climate change significantly threatens global food security, underscoring the need for resilient, nutrient-dense crops within sustainable agriculture. Food crops, which are well-adapted to challenging environmental conditions, hold considerable promise for enhancing food security. Maintaining food security in low and middle-income countries like Ghana is very crucial because they are likely to suffer the most from exposure to climate shocks, to unsustainable food systems. It is essential to identify indigenous crops that are climate-resilient and have good nutritional quality to enhance food quality, sustainability and human health. This study aims to explore the genetic and biochemical diversity of selected indigenous crops, identifying traits that promote sustainability.

METHODS
This study focuses on three key food crops in Ghana: cassava, tomato, and Bambara groundnut. Samples were collected from local farms to analyze their genetic and biochemical diversity. Utilizing molecular markers and whole genome sequencing, the genetic profiles of these crops were, emphasizing traits related to yield, morphology, and environmental resilience. Moreover, biochemical profiling—including metabolomics, ionomics, and lipidomics—assessed their nutrient composition and bioactive compounds.

RESULTS
The outcomes will inform breeding programs aimed at enhancing crop resilience and nutritional quality, thereby advancing sustainable agriculture and food security.

CONCLUSIONS
In conclusion, leveraging the genetic and biochemical strengths of indigenous crops represents a promising approach to addressing the challenges posed by climate change and nutritional deficiencies, fostering a sustainable agricultural future.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_136

ALMOND SOLIDS FROM ROASTED IN-SHELL ALMONDS AND PLANT-BASED DRINKS FROM ROASTED IN-SHELL ALMONDS AS A NOVEL FOOD AND POTENTIAL FUNCTIONAL FOOD

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BACKGROUND AND OBJECTIVES

Almond kernels have a long history of human consumption either raw, cooked, or dry roasted, sliced or whole, blanched or unblanched. Whereas the almond kernel has been the product of interest, the shell has been always removed and often also the skin. As such, the almond industry generates a large amount of by-products. The new RE-NUT® method processes the nuts «in-shell». This doubles the yield of nut flour, paste and milks. Moreover, this leaves in all the nutshells' valuable fiber and antioxidants. This patent-protected technology is now ready to be licensed by nut processors and food companies. Such food ingredients fall under the EU Novel Food Regulation (EU) 2015/2283. EFSA is currently evaluating the novel food dossier no. NF-2024-22731.

METHODS

Physical, chemical and microbiological specifications were established for almond solids from roasted in-shell almonds and plant-based drinks from roasted in-shell almonds. In addition, information and data obtained from the public domain on the components of almond shells (genotoxicity and human clinical studies) were collected.

RESULTS

Almond skin has been identified as a source of phenolic compounds. The shells are rich in fibers such as cellulose, hemicellulose, and lignin. As almond kernel and skin have a history of consumption, no toxicity tests were deemed necessary to further confirm their safety. Same applies to the plant-based drink from roasted in-shell almonds. The analytical data confirm that almond solids from roasted in-shell almonds and plant-based drink from roasted in-shell almonds are relatively low or below the level of detection of microbiological contaminants, heavy metals, and environmental contaminants such as pesticides, aflatoxins. Almond solids from roasted in-shell almonds and plant-based drink from roasted in-shell almonds contain only trace levels of polyphenols, and cyanogenic glycosides are below the level of detection. The potential allergenicity of almond solids from roasted in-shell almonds and plant-based drink from roasted in-shell almonds is considered to be not indifferent from allergy to almonds.

CONCLUSIONS

As per Regulation (EU) 2015/2283, the proposed novel food does not pose a safety risk to human health and does not mislead the consumer. On the contrary, it poses an alternative that can coexist with the current almond ingredients (in solid or liquid form) for different applications. Moreover, the bioactive constituents may provide for a possible unique and pleasant functional food.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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3. https://open.efsa.europa.eu/dossier/NF-2024-22731

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EPO2_137

ASSESSING THE AFFORDABILITY OF SUSTAINABLE DIETS: A COMPARATIVE ANALYSIS OF THE COST OF DIETS IN THE URBAN FOOD ENVIRONMENT IN AUSTRIA

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BACKGROUND AND OBJECTIVES

Inequalities within the agri-food system affect small-scale producers, workers throughout the value chain, and consumers (1). Recent reports on food poverty in Austria highlighted issues related to the affordability of sustainable and healthy diets (2). Consuming a healthy and sustainable diet is crucial to reduce diet-related diseases, addressing planetary health and issues of equity and fairness in the food systems (3, 4).

METHODS

This study investigated the minimum costs of adopting a healthy and sustainable diet (in line with the Austrian food-based dietary guidelines (FBDG)) (5) compared to a reference diet based on the Austrian nutrition report (6). We analysed the affordability of organic versus conventional food products for omnivore and vegetarian dietary patterns. Food price data from eight different supermarkets (ranging from discount to high end markets) and four alternative food networks were collected for 361 food items categorized into the food groups of the Austrian FBDG. For each food group the least expensive item was selected and the amounts (in calories and grams) of each group were calculated to meet the standard Austrian adult dietary energy intake target of 2029kcal/d (5, 7). Our analysis considered the economic implications for consumers, relating the food costs to income and overall food expenditure.

RESULTS

Our RESULTS will show the difference between organic and conventional food choices selected for recommended healthy and sustainable omnivore and vegetarian diets. Differences between different types of food outlets (discount, high-end as well as alternative. Our study will further show how affordable these diets are to different levels of income. The variety and geographic origin of food items will also be presented for selected food outlets.

CONCLUSIONS

Healthy and sustainable diets are associated with affordability issues. Important aspects of acceptability, preferences, and opportunity costs for meal preparation are important factors which should be considered in future studies. Furthermore, social aspects of sustainability including access to basic needs, justice, social inclusion and participation and right to food need to be part of discussions on food affordability.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_138

TRANSCULTURAL ADAPTATION OF QUESTIONNAIRES ON KNOWLEDGE AND ATTITUDES OF HIGHER EDUCATION STUDENTS REGARDING FOOD SYSTEMS

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BACKGROUND AND OBJECTIVES
The growing discussion about the impacts of current hegemonic food systems on human and environmental health, such as the occupational risks faced by workers in the global agri-food system, the spread of unhealthy dietary patterns, environmental contamination, and the presence of contaminated, unsafe, and adulterated food, highlights the central role of global agendas that intersect discussions on Food Systems, Sustainability, and Food and Nutrition Security. This underscores the need to incorporate the topic into higher education, particularly in courses related to food, understanding that higher education should enhance the understanding of the human being and their surrounding environment and promote awareness of contemporary global challenges. Thus, the objective of this study is to carry out the transcultural adaptation of two international questionnaires, one on knowledge and the other on attitudes of undergraduate students regarding food systems and analyze their validity and reliability.

METHODS
This quantitative study follows a methodological approach consisting of transcultural adaptation and validity analysis of the U.S. "Food Systems Knowledge and Attitudes Survey for College Students," developed at the University of Tennessee. Two questionnaires, each composed of 11 items, are used: the first with dichotomous responses and the second using a Likert type scale. The transcultural adaptation will follow the guidelines of Beaton (2000) and PROMIS (2013), incorporating the following steps: a. Preconditions, b. Translation, c. Synthesis of translations, d. Back-translation, e. Review of back-translation, f. Expert committee, g. Pre-finalization, h. Finalization, i. Harmonization, j. Final review, k. Pilot test, and l. Submission of documentation. Additionally, psychometric tests will be employed, including validity analysis (content validity, response process, internal structure, relationship with other variables, and testing consequences, utilizing classical test theory and exploratory and confirmatory factor analysis) and reliability (using composite reliability tests).

RESULTS
This research will present the validated questionnaires for the Brazilian context, and so far, the translation and back-translation of the instrument have been completed. It is expected that by the time of the conference, the validated Brazilian version of the instrument will be presented.

CONCLUSIONS
These RESULTS will open opportunities for future research, with implications for public policies, changes in curriculum guidelines, and the epistemological foundations of higher education.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_139

PERCEPTIONS AND CONSUMPTION OF PULSES, AND UNDERSTANDING AUSTRALIAN ADOLESCENTS' PERCEPTIONS OF HEALTHY AND SUSTAINABLE DIETS

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BACKGROUND AND OBJECTIVES
IBACKGROUND AND OBJECTIVES: Increased consumption of pulses (the edible grains of legumes such as lentils and chickpeas) is recommended to promote healthy and sustainable dietary patterns. Dietary behaviours are influenced by consumers' perceptions of foods, and their capability, opportunity and motivation to make specific dietary choices. Adolescence is a period in which perceptions and behaviours develop that can impact lifelong dietary behaviours. This project aimed to understand how Australian adolescents perceive healthy, sustainable diets, and perceive and consume pulses.

METHODS
Highschool students (11-17 years old, n=33) in Brisbane, Australia participated in face-to-face focus groups to discuss their perceptions of, and barriers and enablers of healthy and sustainable diets, and pulses. Participants completed an online survey regarding their consumption patterns of pulses.

RESULTS
Adolescents' perceptions of healthy and sustainable dietary behaviours largely focused on the health aspects of food, and consideration of food waste behaviours. The main factors influencing the health and sustainability of their diet were a lack of perceived responsibility for the impact of their meal choices, and lack of knowledge of what constitutes a healthy and sustainable diet. Most adolescents were unfamiliar with the term 'pulses' and lacked a desire to consume pulses more often. Consumption of pulses was lower than recommended in national and international dietary guidelines. The main factors influencing pulse consumption related to adolescents' lack of skills and knowledge to prepare pulses, and the reduced accessibility and availability of appealing pulse-based foods.

CONCLUSIONS
Education and cooking classes, and increased availability of tasty pulse foods are recommended to increase adolescents' pulse consumption as part of a healthy and sustainable diet.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_140

NUTRITIONAL LIFE CYCLE ASSESSMENT (LCA) OF SHIFTING TO PULSES FROM ANIMAL SOURCED FOODS: AN AUSTRALIAN CASE STUDY OF HUMMUS VS HAM SANDWICH

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BACKGROUND AND OBJECTIVES
Increased consumption of foods with pulses (eg. lentils or chickpeas), which are a source of protein, is suggested due to their lower environmental impact than animal-sourced foods. However, Australian data for the environmental and nutritional trade-offs for such a dietary shift has been lacking. We therefore assessed the environmental and nutritional impact of consuming hummus or ham on a sandwich using Australian data.

METHODS
The environmental impact of two scenarios of ham (produced in Australia or imported from Europe) and three scenarios of hummus (produced commercially, or homemade with canned or dried chickpeas), within the meal context of a sandwich were evaluated using LCA. Impacts considered were climate change, water scarcity and eutrophication potential. Life cycle inventory data were adapted for the Australian context, from cradle to plate. The nutritional value of ham or hummus sandwiches were evaluated using the Nutrient Rich Foods Index (NRF9.3-including nine beneficial nutrients and three nutrients to limit).

RESULTS
Initial RESULTS indicate that the environmental impact of a hummus sandwich was lower than a ham sandwich across all environmental indicators, regardless of the production methods of ham or hummus. Quantitative environmental impact indicators for each of the ham and hummus scenarios will be presented at the conference. A sandwich with homemade hummus had the greatest positive nutritional value (NRF9=0.23 for boys (aged 14-18yo); NRF9=0.28 for girls (aged 14-18yo)), with less nutritional value from the commercial hummus (NRF9=0.17 for boys; NRF9=0.28 for girls), and from ham (NRF9=0.09 for boys; NRF9=0.11 for girls). The score for nutrients to limit was largest for a sandwich with ham (NRF3=-0.12 for boys; NRF3=-0.12 for boys) than homemade hummus (NRF3=-0.08 for boys; NRF3=-0.08 for girls) or commercial hummus (NRF3=-0.08 for boys; -0.02 for girls).

CONCLUSIONS
Using Australian data, this case study demonstrated that hummus, in comparison to ham, in a sandwich, has lower environmental impact, and healthier nutritional profile. Localised data should be used in LCA studies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_142

AGRICULTURE, FOOD AND NUTRITION SECURITY IN NIGER STATE, NIGERIA

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BACKGROUND AND OBJECTIVES

Agriculture remains a major driver of Nigeria's economy, yet malnutrition persists. This study was designed to evaluate agricultural diversification, food security and nutrition situation to inform policy reform and agricultural programme interventions in Niger state.

METHODS

The mixed-method study involved a two-stage cluster sampling of 451 households across 13 Local Government Areas. An interviewer-administered questionnaire was used to collect data including socio-demographic characteristics, dietary intake (Minimum Dietary Diversity classified as low (*<5*) and high (*≥5)*, *Household food insecurity access*, and agricultural output diversification (Herfindahl Index HHI lassified as low (<0.01), medium *(0.01 < HHI ≤ 0.18)* and high *(HHI > 0.18).* In-depth interviews were conducted with agriculture stakeholders, and focus group discussions with women's groups *to explore understanding of healthy diet, utilization of indigenous food crops and household food consumption practices*. Data analysis included descriptive statistics, and thematic analysis of qualitative data.

RESULTS

Households were largely male-headed (92.9%), medium-sized (4-6 members) (61.0%), and earned income below N500,000 (US$350) *annually (65.2%). Sugar/salt/spices (99.15%), fish/meat/egg/poultry group (97.44%), fruits and vegetable (92.02%), cereals and grain group (80.06%) were the most purchased food groups. About half (51.9%) of the households combined crop production and livestock, 65% had access to extension services, and only 33% practiced dry season farming. Majority (68%) had low, 12% had medium and 20% had high output diversification. About 65% were food insecure including mild/moderate (38.8%), and severe (26.5%). Coping strategies were reduction in consumption expenditures (64.7%) and reducing meals (63.2%).* Mean dietary diversity was 3.63 ± 1.08 and only 21.7% met MDDW. Women expressed fair understanding of the concept of healthy diet, however, food preparation is largely influenced by household food availability and the preference of the household head.

CONCLUSIONS

Food insecurity and poor diet quality characterise farming households in Niger state, and context-relevant food system interventions are required.

CONFLICTS OF INTERESTS

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EPO2_143

EXPLORING RAW VEGETABLE WASTE AND RESOURCE RECOVERY IN A INDONESIA NATIONAL NUTRITION PROGRAM

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BACKGROUND AND OBJECTIVES

In January 2025, the newly established National Nutrition Agency embarked on a transformative initiative to combat malnutrition and promote health among vulnerable populations. Over the span of five years, the agency aims to deliver one nutritious school meal per day to students in both public and private schools, every two days for children under the age of five, pregnant and lactating women, with a total of 83 million individuals. With budget of USD 4.4 million for the first year, each meal is valued at USD 0.62 and is designed to meet 20 to 35% of daily nutritional requirements, providing around 328 to 818 kilocalories. By the end of January 2025, the program seeks to establish 937 Nutrition Service Units (NSUs), each serving between 3,000 to 4,000 individuals. We would like to explore the potentials of raw vegetable waste resulted by this initiative.

METHODS

Our approach involved literature search and analysis. The search encompassed a review of the agency's site, news, and regulation of the program. The analysis included calculations of the potential value of vegetable waste into compost and other usage.

RESULTS

Assuming each person is served with 50 gram of green-leafy vegetables and 27% waste rate, each person contributes 18 g of raw vegetable waste per day. Each Nutrition Service Unit (NSU) that serves 3,500 people is estimated to generate around 65 kg of raw vegetable waste per day or 19 kg of compost. The compost will be able to enrich 9 green-leafy vegetable plants, assuming each plant needs about 2 kg of compost for its growth. Per month, there will be 380 kg of compost produced, with the ability to enrich all plants needed for one NSU for one month (159 plants or 476 kg of raw vegetables). The leftover compost can be sold for potential income of USD 17.00 per month that can be used to purchase the seeds and other necessitie

CONCLUSIONS

There is a potential self-sufficiency of the NSU in providing its monthly green-leafy vegetable need by managing its vegetable waste. These RESULTS highlight the potential for significant resource recovery and environmental benefits through effective waste management practices.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_146

NUTRITIONAL IMPACT OF FOOD LOSS AND WASTE IN THE PROCESSING, DISTRIBUTION AND RETAIL OPERATIONS OF MICRO, SMALL AND MEDIUM-SIZED FOOD-PROCESSING ENTERPRISES IN THAILAND: A COUNTRYWIDE SURVEY ON FIVE FOOD CATEGORIES

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BACKGROUND AND OBJECTIVES
Reducing food loss and waste (FLW) in a sustainable manner offers considerable potential for improving food security and nutrition and generating economic and environmental benefits. Nevertheless, significant quantities of FLW are generated in micro, small and medium-sized food processing enterprises (MSMEs). Reducing FLW is not, however, a high priority for many MSMEs, and they often do not quantify FLW and consider its impact in their operations. Information on FLW in MSMEs is thus currently scarce. This study aimed to measure and reduce FLW and to determine nutritional impact in the operations of MSMEs in Thailand.

METHODS
FLW measurements were conducted following the Food Loss and Waste Protocol's Guidance on FLW Quantification Methods in 25 MSMEs in Thailand across 5 food categories, namely meat products, fish products, processed fruits, rice, and dairy products. Five representative MSMEs countrywide were purposively selected for each food category. Data was collected for 5 operation days at each enterprise in June-November 2022. The amount of FLW in processing, distribution and retail operations was quantified. Nutrient content was estimated using INMUCAL-Nutrients V.4.0 software.

RESULTS
The median (range) percentage of avoidable FLW in MSMEs was 11.10 (6.22-15.17) for meat products, 8.75 (4.18-36.75) for fish products, 7.60 (4.35-19.83) for processed fruits, 22.57 (6.21-41.65) for rice, and 2.61 (0.54-16.04) for dairy products. For each kg of raw material input (RM), the highest caloric loss due to FLW was found in rice processing enterprises (811.88 kcal/kg RM), while that of milk processors was the lowest (16.18 kcal/kg RM). Comparing with the recommended daily amounts of meat, fish, fruits, rice, and milk for healthy Thai adults, FLW generated from each 100 kg RM would be sufficient for 62, 65, 55, 38, and 13 persons, respectively.

CONCLUSIONS
This is the first study providing evidence-based information on FLW in food processing MSMEs in Thailand. The quantity of FLW and its associated nutrients varied among different food categories and enterprises. FLW not only negatively affects the profitability of MSMEs but also has an adverse impact on the availability of food to fulfill nutritional requirements of the population, which consequently threatens food security and sustainability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_147

THE ASSOCIATION BETWEEN SUSTAINABLE AND HEALTHY EATING BEHAVIORS AND DEPRESSION, STRESS, AND ANXIETY IN ADULTS

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BACKGROUND AND OBJECTIVES
The aim of this study is to determine the relationship between sustainable and healthy eating behaviors and depression, stress, and anxiety in adults.

METHODS
A questionnaire form including sociodemographic information, the Sustainable and Healthy Eating Behaviors Scale, and the Depression, Anxiety, and Stress Scale-21 was administered to the participants. The Kruskal-Wallis test was employed to determine differences among the groups.

RESULTS
The study included a total of 375 participants aged between 19 and 64 years. Among the participants, 25,3% were male, and 74,7% were female. The median age was 25 (19-62) years. In terms of education level, 53,9% of the participants graduated from high school, and 35,5% from university. When participants were grouped based on their depression scores, significant differences were observed in the scores of the sub-dimensions *Quality Labels*, *Seasonal Food* and *Avoiding Food Waste*, *Animal Welfare*, *Healthy* and *Balanced Diet*, *Local Food*, and *Low Fat* ($p < 0.05$). Similarly, grouping by anxiety scores revealed significant variations in the sub-dimensions of avoiding *Food Waste* and *Healthy And Balanced Diet* ($p < 0.005$). Conversely, no statistically significant differences were found between groups when categorized by stress scores ($p > 0.05$).

CONCLUSIONS
The RESULTS of this study suggest that depression scores are significantly associated with sustainable and healthy eating behaviours. These findings emphasise the importance of nutritional strategies that simultaneously improve mental health and promote environmental sustainability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_148

THE EFFECT OF ECO-LABELS AND PRICE DISCOUNTS TO PROMOTE SUSTAINABLE FOOD PURCHASES ON THE NUTRITIONAL CONTENT OF ONLINE GROCERY PURCHASES IN THE UK: A RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
Effective interventions are needed to promote both sustainable and healthier food choices. However, interventions aimed at promoting sustainable food purchasing could also support better nutritional outcomes or have unintended negative side effects. Using an online grocery shop, which offers a way to study and evaluate these interventions on a large scale, we assessed the effect of eco-labels and price discounts on the nutritional content of shopping baskets in a real online supermarket in the UK.

METHODS
Participants were recruited from the UK Prolific panel and randomly assigned to one of six groups in a 2x3 factorial design. The interventions included: (i) eco-labels, which displayed the environmental impact of products on a scale from A (lowest impact, most sustainable) to G (highest impact, least sustainable), and (ii) price discounts (£1, £0.50, or no discount) offered on more sustainable alternative products that were in the same or a better category for fat (including saturated fat), sugar, and salt content on the traffic-light label for $\leq$3 items in their basket. Nutritional outcomes measured included energy (KJ/100g), fat, sugar, salt, and saturated fat (all in g/100g). Regression analysis was used to assess the effect of the interventions on these nutritional outcomes.

RESULTS
A total of 1,426 participants who shopped at least once were included in the analysis. The eco-labels had a very small, non-statistically significant effect on the nutritional content of baskets, with increases in sugar (b = 0.183, p = 0.39), fat (b = 0.053, p = 0.79), saturated fat (b = 0.107, p = 0.32), and energy (b = 10.461, p = 0.30), and small, non-significant decreases in salt (b = -0.017, p = 0.72). Similarly, the £0.50 discount showed small, non-significant effects on sugar (b = -0.263, p = 0.30), salt (b = -0.035, p = 0.49), saturated fat (b = -0.114, p = 0.34), energy (b = -10.594, p = 0.24), and fat (b = -0.054, p = 0.79). The £1 discount also did not appear to affect the nutritional content of purchases [sugar (b = 0.091, p = 0.73), salt (b = 0.025, p = 0.70), and fat (b = 0.023, p = 0.92)], except that energy purchased may have been slightly lower (b = -7.280) but this difference was also not statistically significant (p=0.07).

CONCLUSIONS
Eco-labels and price discounts did not lead to statistically significant changes in nutritional outcomes. These findings suggest that further research is needed to explore the potential effectiveness of such interventions in promoting healthier food choices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_149

EFFECTS OF A CRICKET-BASED DIET ON GROWTH, BODY COMPOSITION AND BONE PARAMETERS IN PROTEIN-DEFICIENT MALE AND FEMALE JUVENILE SPRAGUE-DAWLEY RATS

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BACKGROUND AND OBJECTIVES
Protein-energy malnutrition is a major global health problem and contributes to stunted growth and impaired musculoskeletal development, particularly in children in low- to middle-income countries. Cricket (Order: Orthoptera) has a protein content comparable to that of meat while being environmentally friendly. This study aimed to investigate the effects of a cricket-based diet (CBD) on growth, body composition and bone parameters in protein-deficient juvenile Sprague-Dawley rats of both sexes.

METHODS
Three-week old male and female rats were first fed either a low-protein diet (LPD, 6% protein; n=24/group/sex) or a normal-protein diet (NPD, 18% protein from casein; n=8/group/sex) for 3-week to induce malnutrition in the LPD group. The LPD group was then divided into three subgroups for a 7-week intervention: LPD (maintaining LPD), treated protein diet (TPD; switching to NPD) and CBD (feeding CBD; 18% protein diet from cricket). The NPD group remained on the NPD.

RESULTS
Both the male and female LPD groups had significantly ($p<0.05$) lower body weight, body length, tail length and abdominal circumference than the male and female NPD groups after the 10-week feeding period. Both the male and female LPD groups also had significantly ($p<0.05$) lower femur and tibia weight, bone mineral density, bone mineral content, lean mass and fat mass than the NPD rats. However, no significant difference in these parameters was found between the male LPD, TPD and CBD groups. Similarly, no significant difference in these parameters was also found between the female LPD, TPD and CBD groups, except that female CBD group had lower body mineral content and fat mass than the female TPD and NPD groups. There were no significant differences between all groups in bone biomechanical strength, bone calcium content and serum IGF-1 levels in either sex.

CONCLUSIONS
Low protein diet exerts adverse effects on growth, body composition and bone parameters in both male and female rats. These adverse effects cannot be reversed by re-supplementation with casein or protein from cricket. Further studies should explore the long-term effects of consuming cricket as a sustainable protein on growth, body composition and bone parameters to combat malnutrition.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_150

INDIGENOUS KNOWLEDGE AND SPIRITUALITY ATTACHMENTS TO THE GROWING, PROCESSING AND CONSUMPTION OF SELECTED GHANAIAN FOOD CROPS ACROSS THE VALUE CHAIN

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BACKGROUND AND OBJECTIVES
Indigenous knowledge and spirituality fundamentally shape how communities interact with their environment, particularly regarding food systems. This research explores these connections in the context of Ghanaian food crops, examining how indigenous knowledge and spiritual beliefs influence growing, processing, and consumption practices.. The study aims to document indigenous knowledge systems in Kintampo and Techiman, Ghana, analyse the social significance of food practices, and investigate how spiritual attachments or beliefs impact food cultivation, processing, and consumption.

METHODS
Using a mixed-method approach with a Convergent Parallel Design, the study targets 384 respondents for quantitative data, while the qualitative sample size will be determined through saturation.

RESULTS
A preliminary analysis of 348 quantitative responses has been conducted to understand the relationships between spiritual beliefs, agricultural practices, and productivity outcomes. Initial findings indicate that demographic factors including age, sex, and religion have minimal influence on agricultural practices. However, specific spiritual beliefs, particularly trust in ancestral spirits guiding agricultural practices, significantly impact crop yields

CONCLUSIONS
The preliminary findings emphasise the cultural significance of spirituality in agricultural productivity and highlights the complex relationship between traditional beliefs and farming success in these communities.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_151

FERMENTED TENEBRIO MOLITOR LARVAE EXTRACT MITIGATES OSTEOSARCOPENIA BY REGULATING THE CROSSTALK BETWEEN SKELETAL MUSCLE AND BONE THROUGH THE RANKL-NFKB/MAPK SIGNALING PATHWAY

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BACKGROUND AND OBJECTIVES
Tenebrio molitor Larvae (mealworms) are recognized as a representative alternative protein source among edible insect for the future. When fermenting mealworms with yeast (FME), the amino acid content, particularly the branched-chain amino acid contents, increased approximately two-fold. Recently, osteosarcopenia (OS) has been found to increase the risk of mortality in older people. Our previous study demonstrated that FME simultaneously alleviates both osteoporosis and sarcopenia in ovariectomized mice. Therefore, the present study aimed to identify a baseline for improving OS by determining the effect of FME on the interaction between muscle and bone tissues.

METHODS
OS was induced through ovariectomy, and the mice were divided into five groups: sham, ovariectomy (OVX), OVX with two doses of FME (200 and 500 mg/kg, orally), and OVX with alendronate (positive control, 500 μg/kg, orally) for 15 weeks. Markers of crosstalk between skeletal muscle and bone were measured using western blot, RT-qPCR, and ELISA.

RESULTS
OVX decreased serum estradiol level, while increased the levels of RANKL, IL-6, and CTX-1. In contrast, the FME500 group was able to restore these levels. In both muscle and bone tissues, OVX upregulated the cytokines RANKL, IL-6, and TNF-α, while downregulated IGF-1, indicating that OVX promotes both muscle atrophy and bone resorption, simultaneously. However, the FME500 group significantly improved the levels of these cytokines. FME suppressed the phosphorylation of AMPK and increased phosphorylation of Akt in muscle tissue, thereby activating mTOR (which promotes protein synthesis) and inactivating FoxO3α (which is involved in protein degradation). Additionally, FME inactivated the RANKL-NFκB/MAPK pathway, leading to an increase in muscle protein synthesis markers (MyoD and MHC) and a decrease in muscle degradation markers (atrogin-1 and MuRF-1) compared to the OVX group. In bone tissue, FME inhibited osteoclast differentiation through the phosphorylation of Akt and inactivation of the RANKL-NFκB-cFos-NFATc1 and MAPK signaling pathways. This resulted in suppressed osteoclast activation (as indicated by cathepsin K) and reduced bone resorption (as indicated by TRAP) in OVX mice.

CONCLUSIONS
These RESULTS demonstrated that sustainable alternative protein FME has ameliorative effects in OS, simultaneously modulating the RANKL-NFκB/MAPK and Akt signaling pathways in both bone and muscle.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_153

EXPLORING THE INTERCONNECTION BETWEEN DIET AND PLANET: VALIDATING A HEALTHY MEAL INDEX FROM ASSESSING MEAL PHOTOS THROUGH ENVIRONMENTAL IMPACT INDICATORS

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BACKGROUND AND OBJECTIVES
Food production has caused significant negative impacts on the environment, especially on natural resources such as soil, water and atmosphere. In this context, a balanced diet should benefit people's health and the planet. Dietary sustainability can be assessed by environmental indicators such as land use, greenhouse gas (GHG) emissions, eutrophication and freshwater use. Thus, the objective of this study was to validate the sustainability of the Meal Quality Index based on the evaluation of meal photos (MQI-photo) and to compare the quantification of land use, GHG emissions, eutrophication and freshwater use of meals with the final MQI-photo score.

METHODS
Secondary data from the “ClicPrato” project was used, which assesses meal quality through photographic records of lunch and/or dinner, based on nine components developed based on national and international recommendations. Ninety participants sent photos of their meals, recording food and respective quantities. Environmental indicators (land use, GHG emissions, eutrophication and freshwater use) were calculated using World Wide Fund for Nature (WWF) data. Statistical analyses were performed using STATA® software (version 14.0; College Station, Texas, USA), with a significance level of 5%, using Spearman correlation, Bland-Altman analysis and Kappa statistics to assess the agreement between the IQR-photo tertiles and the environmental indicators.

RESULTS
According to the final IQR-photo score categorized into tertiles, that is, the higher the tertile, the better the quality of the meal; it was possible to observe that the individuals who were in the first tertile presented the highest values referring to the environmental indicators when compared to the third tertile. There was no correlation between the IQR-photo score and the quantification of the environmental impact indicators ($p > 0.05$). The agreement between the tertiles of the IQR-photo score and the environmental impact indicators was also carried out. It was observed that the exact agreement between the tertiles ranged from 27.8% to 35.6%; however, it was not significant ($p > 0.05$).

CONCLUSIONS
Although no significant associations were identified, the literature suggests possible positive relationships between meal quality and sustainability. These RESULTS reinforce the need to improve the index and for new studies to explore these relationships in greater depth.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_154

CLIMATE CHANGE-RELATED METABOLOMICS STUDY OF RAW MILK FROM THAI CATTLE FARMS

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BACKGROUND AND OBJECTIVES

Dairy products are one of the conventional foods that are a crucial source of nutrients to promote the people's health at all ages. Meanwhile, climate change is a crucial issue worldwide that impacts planetary health, including dairy production. Previous research focused on heat-induced changes in cows' behavior and milk yield. However, few studies have addressed the global changes in metabolic pathways in milk, particularly in Thailand. To expand this matter, this project aims to explore the metabolomics profile in milk related to climate change.

METHODS

The study is conducting on a dairy farm in Thailand in which a sampling plan in different seasons. The biggest differences in temperature and humidity along the year were considered the main factors to collect the milk samples. The area of sampling was selected, which represents the biggest dairy cooperative center, the Dairy Farming Promotion Organization of Thailand (DPO). The milk samples in this study are from DPO production and cooperative cattle farms. The analysis was done with proximate composition and SB-Aq metabolomics using LC-qTOF/MS.

RESULTS

The preliminary data of the milk sample from the first batch showed that the nutrient composition of the samples were similar. And also the preliminary metabolomics profile was similar but different in some sources, as shown statistically by PCA analysis. Qualitative analysis of metabolites found that 405 compounds were discriminating up-down regulated in each group of samples. For further RESULTS, milk from different seasons was compared.

CONCLUSIONS

These research findings can support more in-depth research to explicate the milk-based changes in nutrient and metabolic pathways in dairy cows.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

1. Metabolomic analysis based on the standard method of Periodic Table of Food Initiative (PTFI)
2. Proximate Analysis based on AOAC 2023 (990.19, 991.20, 989.05, 945.46, 963.22, 969.33)

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EPO2_155

ADOLESCENTS' PERCEPTION OF "VEGETARIAN DAY" AND ITS ASSOCIATION WITH NUTRITIONAL STATUS IN SOUTH KOREA

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BACKGROUND AND OBJECTIVES
In South Korea, schools have been implementing a regular “Vegetarian Day” in school meals to promote adolescent health and encourage sustainable dietary practices. However, research on adolescents’ perceptions of Vegetarian Day and its association with their nutritional status remains limited. This study aims to assess perception of sustainable eating habits and Vegetarian Day, as well as the overall quality of their diet, and to investigate their association in Korean adolescents.

METHODS
A survey was conducted in July 2023 among 372 middle and high school students (230 males and 142 females) in Daejeon, South Korea. The survey questionnaire was structured into four categories: general characteristics, Nutrition Quotient for Adolescents (NQ-A), sustainable eating education, and perception of Vegetarian Day.

RESULTS
Among the participants, 56.2% had received education on sustainable eating. The most relevant topics for sustainable eating education were ranked as follows: environmental impact (36.8%), health effects (33.3%), and animal welfare and ethical issues (12.7%). Perception of Vegetarian Day was assessed using a 5-point Likert scale, with an overall score of 3.21. The statement “I think Vegetarian Day will help students' health” received the highest score (3.67), while “I think the meat alternative food used in school is delicious” received the lowest score (2.80). Correlation analysis showed a significant positive association between perception of Vegetarian Day and the total NQ-A score ($r=0.166$, $P<0.01$) as well as the moderation NQ-A score ($r=0.203$, $P<0.001$). Furthermore, regression analysis indicated that perception of Vegetarian Day had a significant impact on the total NQ-A score ($P<0.01$), the balance NQ-A score ($P<0.05$), and the moderation NQ-A score ($P<0.001$), with explanatory power (R^2) values of 0.027, 0.012, and 0.038, respectively.

CONCLUSIONS
These findings highlight the importance of sustainable eating education for adolescents and provide foundational evidence for exploring the relationship between sustainable dietary practices and nutritional status.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_157

BARRIERS THAT MEDIATE THE ASSOCIATIONS BETWEEN AN INDIVIDUAL'S VALUES AND CONSUMING LEGUMES SELDOM

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BACKGROUND AND OBJECTIVES

To promote health and sustainability, the New Nordic Nutrition Recommendations encourage increase in legume consumption. An individual's values are life guiding principles that are known to be associated also with consumption of plant-based protein sources. We examined what factors explain the associations between valuing power, achievement, hedonism, and tradition, and seldomly consuming legumes.

METHODS

18–75-year-old Finns (n=1000) completed an online survey in autumn 2020. Values were assessed with a Short Schwartz's Value Survey, barriers with thirteen questions, and legume consumption with a short Food Frequency Questionnaire. We examined the associations using mediation analyses (lavaan package, R), adjusting for gender, age, and education.

RESULTS

Individuals valuing power and tradition reported the most barriers to consuming legumes (Table 1). The most common mediator was considering legumes tedious to prepare, followed by not liking the mouthfeel of legumes and believing that their family would not eat them.

Table 1. Mediators of the associations of an individual's values and consuming legumes seldom (< once a month) (p<.05).

Barriers for legume consumption:	Power	Achievement	Hedonism	Tradition
Are not familiar				+
Don't like the taste	+		+	
Unpleasent mouthfeel	+		+	+
Don't know how to prepare		+		+
Preparing is tedious	+	+	+	+
Family doesn't want to eat	+	+		+
Cause stomach problems	+			
Don't satiete				+
Are not healthy	+			+
Are not sustainable	+			+

CONCLUSIONS

Individuals valuing power, achievement, hedonism, and tradition might benefit from diverse emphasis in the communication and interventions promoting legume consumption. Still, providing legumes that are ready-to-use and familiarizing individuals with the mouthfeel may help increase legume consumption among individuals with diverse values.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_158

OILSEED CAKES AS SUSTAINABLE SOURCES OF AMINO ACIDS AND MINERALS

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BACKGROUND AND OBJECTIVES
Oilseed cakes, the by-products of oil extraction processes, are traditionally used as compost, fertilizers, or animal feed due to their high protein, fiber, vitamin, mineral, and antioxidant content. With the increasing global demand for sustainable protein sources and environmental challenges, these nutrient-rich by-products are gaining attention for their potential in human nutrition. This aligns with the principles of the circular economy, promoting resource efficiency and waste reduction. The objective of this study was to characterize the amino acid and mineral profiles of pumpkin and sunflower oilseed cake flours, assessing their nutritional value and suitability for incorporation into innovative food products.

METHODS
To evaluate the nutritional composition of pumpkin and sunflower oilseed cake flours, amino acid profiling was conducted using ion chromatography with electrochemical detection. Mineral content analysis was performed using inductively coupled plasma mass spectrometry (ICP-MS).

RESULTS
The RESULTS revealed that, as expected, oilseed cake proteins lacked sulfur amino acids. In pumpkin oilseed cake flour L-glutamate was the most abundant (11.68%), followed by L-arginine (8.02%) and L-aspartate (5.11%). L-glutamate was the main amino acid in sunflower oilseed cake flour as well, but the percentage of it was lower (7.26%). When it comes to minerals, potassium was found in high concentrations in both oilseed cake flours (1915 mg/100 g and 1410 mg/100 g for pumpkin and sunflower, respectively). Also, sunflower oilseed cake flour was characterized by high amounts of calcium (1937 mg/100 g).

CONCLUSIONS
Based on these findings, it can be concluded that oilseed cakes represent rich sources of minerals and valuable amino acids. Their broader utilization for human consumption would contribute to the sustainable development of the food industry and open more opportunities for the development of innovative food products.
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EPO2_159

THE RELATIONSHIP BETWEEN SUSTAINABLE AND HEALTHY EATING BEHAVIORS AND THE TREND OF ORGANIC FOOD CONSUMPTION WITH THE ADHERENCE TO THE MEDITERRANEAN DIET IN EMERGING ADULTS

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BACKGROUND AND OBJECTIVES
The Mediterranean diet is promising as a sustainable dietary model with its health and environmental benefits and encouragement of organic food consumption. The aim of this study was to identify emerging adults' sustainable and healthy eating behaviors and organic food consumption, and to evaluate their relationship with adherence to the Mediterranean diet.

METHODS
A questionnaire prepared by the researchers was administered to the participants through face-to-face interviews. The participants' sociodemographic characteristics and eating habits were questioned with the questionnaire form, the "Sustainable and Healthy Eating Behavior Scale" was used to evaluate sustainable and healthy eating behaviors, the "Organic Food Consumption Scale" was used to determine organic food consumption, and the "Mediterranean Diet Adherence Scale (MEDAS)" was used to evaluate adherence to the Mediterranean diet.

RESULTS
A total of 500 adults participated in the study, including 214 men and 286 women, with an average age of 21.7 ± 1.76 years. When the individuals' adherence levels to the Mediterranean diet were evaluated, it was determined that 61.4% had low adherence, 29.2% had moderate adherence, and 9.4% had high adherence. A weak, yet significant positive relationship was found between the individuals' MEDAS scores and the total score and all sub-dimensions of the Sustainable and Healthy Eating Scale. Similarly, there was a weak, yet significant positive relationship between the other sub-dimensions of the organic food consumption scale other than norms and health awareness and the MEDAS scores ($p<0.05$).

CONCLUSIONS
The RESULTS of the study emphasize the importance of promoting sustainable healthy eating behaviors and organic food consumption in emerging adults, as their adherence to the Mediterranean diet, considered a sustainable eating model, was found to be quite low.

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EPO2_160

SOLIDARITY KITCHEN AS A STRATEGY TO STRENGTHEN LOCAL SUSTAINABLE FOOD SYSTEMS - THE CASE OF DIRINEIA PINHEIRO KITCHEN IN THE AMAZON

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BACKGROUND AND OBJECTIVES

The current scenario of global syndemic implies negative consequences for both human and planetary health, and poses challenges for the transformation of the global production processes, towards the creation of sustainable food systems. Solidarity Kitchens - CSol are a social technology that has spread throughout Brazil in the political and health context of the COVID-19 pandemic, and are a result of historical experiences of urban and rural social movements. The objective of this work was to identify the potential of CSol Dirineia Pinheiro, in order to characterize it as a resource to enable a local sustainable food system.

METHODS

This is a case study of a CSol in the Brazilian Amazon region, which employed Participant Observation as a research method. Data from field diary records and photoelicitation interviews were coded, recorded and transcribed, respectively. Descriptive and comprehensive analyses in dialogue with the literature enabled the identification of CSol's potential, as well as the challenges to establish it as a structuring equipment for local sustainable food systems.

RESULTS

The main potentialities identified were the possibilities from socio biodiversity ingredients, training in agroecology, the appreciation of food sovereignty and the healthy meals offered at CSol. The main challenges are the lack of regular and permanent access to public services and policies, such as garbage collection, public transportation in rural areas, maintenance of traffic conditions on access roads and unstable internet connections. Another challenge is the precarious working conditions of cooks.

CONCLUSIONS

It was possible to characterize CSol Dirineia Pinheiro as a structuring facility for sustainable local food systems, considering the potential identified in the territory and its historical and social constitution. Even so, there are challenges to be overcome, which require the strengthening of public policies in the country and the rapid implementation of the National Program of Solidarity Kitchens.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_162

INNOVATIVE ENRICHMENT: ASSESSING MORINGA AND SPIRULINA AS ALTERNATIVES TO INDUSTRIAL, COMMERCIAL PREMIXES USED IN NUTRITION PROGRAMS IN AFRICA

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BACKGROUND AND OBJECTIVES

Complementary foods, particularly cereal-based, fall short of meeting infants' nutritional needs in many low-income African countries. Effective approaches, rooted in local food systems, are necessary to improve nutritional contents of complementary foods for children aged 6–23 months. This study explored the potential of using locally produced nutrient-rich foods, moringa leaves and spirulina, to achieve this goal. Findings will contribute to enhance the nutritional quality of complementary foods, and document the economic feasibility of using these alternatives to replace imported premixes.

METHODS

A scoping review was conducted to examine the nutritional composition of moringa and spirulina, assess the acceptability of foods enriched with these ingredients, and evaluate their effects on children's health and nutrition. Additionally, the nutrient contributions of moringa leaves and spirulina were estimated in relation to meeting the dietary requirements of children aged 6–23 months based on the World Health Organization's recommended micronutrient intakes. The economic analysis focused on Chad as a case study and estimated the incremental cost of fortification under two scenarios: using industrial premix and using a natural premix consisting of a 50/50 blend of moringa and spirulina. A standard infant flour recipe was used, with ingredient prices based on data collected in Chad in 2024.

RESULTS

Moringa leaves (5 g/day) provide high vitamin A and C but limited vitamin B2, iron, and zinc. Spirulina (10 g/day) is rich in protein and iron but covers only 3% of zinc requirements and up to 32.2% of folate requirements in infants and young children 6-23 months of age. Acceptability studies demonstrated a high acceptability and compliance of moringa, with less studies reporting on the acceptability of spirulina-enriched foods. A scoping review identified seven studies reporting on the nutritional effects of moringa- and spirulina-enriched foods. Findings showed moringa and spirulina enrichment resulted in inconsistent effects on haemoglobin status, ferritin concentrations and physical growth. Fortifying with industrial premix was more cost-effective, raising costs by less than 1% versus 8–10% with natural premix, due to high costs from Chad's underdeveloped moringa and spirulina value chains.

CONCLUSIONS

Both moringa and spirulina contribute to partially address nutrient gaps. Industrial premixes remain more cost-effective but moringa and spirulina show promises for enriching complementary foods while supporting local economies, sustainability, and resilience in Chad and similar contexts in sub-Saharan Africa.

CONFLICTS OF INTERESTS

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EPO2_166

TAX REFORM IN BRAZIL: A CASE STUDY ON THE IMPACT ON FOOD

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BACKGROUND AND OBJECTIVES
The tax reform on consumption in Brazil has emerged as a highly relevant topic, especially when considering its impact on food. Studying food taxes is crucial to understanding the cost and consequently, the access to healthier options, as the consumption of ultra-processed foods is associated with around 57,000 annual deaths in the country (NILSON,2023). Furthermore, the obesity epidemic is a growing global issue that not only affects public health but is also part of the global syndemic where diseases intertwine with environmental issues, including climate change (SWINBURN,2019). Therefore, this study aimed to analyze how the recently enacted tax reform in the country addressed the issue of food by comparing it with the previous tax system.

METHODS
This study employed a documentary and legislative analysis of the Brazilian tax system before and after the reform enacted in January 2025. The new system's food regulations, unified under a single complementary law to the constitutional amendment, were evaluated. For the previous system, a sample composed of one state from each of the five regions of the country, along with a list of food items based on the NOVA classification of processing (MONTEIRO, 2010), was used, for which federal and state regulations were analyzed.

RESULTS
The RESULTS reveal that the current tax system reduced complexity by adopting only four tax rate levels for food, in contrast to the previous system, which varied significantly between states and products. This standardization helped mitigate discrepancies and increase transparency, particularly regarding benefits granted to the food industries. The taxation levels now reflect the Brazilian Dietary Guidelines (BRASIL,2014) according to the NOVA classification, highlighting the creation of a basic food basket that consolidated the essential and healthy items most consumed by low-income populations. Nevertheless, only soft drinks were included in the highest and most burdensome tax level.

CONCLUSIONS
The tax reform represents a significant advancement by considering healthiness, sustainability, and social justice aspects, thereby aligning economic policy with the Brazilian Dietary Guidelines. However, it remains modest concerning the implementation of a more robust selective tax that could discourage the consumption of products detrimental to health and the environment, particularly ultra-processed products, indicating the need for improvement in the tax policy to effectively induce the necessary changes in the Brazilian food system.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_168

ESTIMATING THE ENVIRONMENTAL COST OF THE DIETARY INTAKE OF ADULT SOUTH AFRICANS

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BACKGROUND AND OBJECTIVES
Agriculture, the food system and human nutritional health are all linked, each having an extensive impact on one another. The objective of this project was to identify suitable metrics to quantify how much the South African adult diet impacts the environment.

METHODS
A quantitative multimethod design was used. Firstly, a scoping review was done to identify appropriate environmental impact factors of foods. Secondly, dietary intake data was extracted from a nationally representative dietary intake survey of adults aged 18-59 years.
Lastly, the dietary intake data was matched with the database on environmental impact factors in order to estimate the environmental cost of foods consumed by South Africans.

RESULTS
The adult South African daily intake is requiring an allocation of land and water daily, while releasing a considerable amount of carbon dioxide. Food retail data suggest an increase in per capita consumption of foods with a high carbon footprint.

CONCLUSIONS
The majority of research that explores the intersection between agriculture and human diets have been conducted in first world countries, thus there is an absence of literature on LMICs. South Africa will benefit from ensuring support is provided to the Agricultural sector to promote sustainable practices, which should be coupled with promotion of sustainable dietary practices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_170

FOOD MATRIX AFFECTS THE DIGESTION KINETICS AND POSTPRANDIAL METABOLISM OF PLANT-BASED PROTEINS: COMPARISON OF IN VITRO AND CLINICAL IN VIVO DATA

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BACKGROUND AND OBJECTIVES
To promote environmental sustainability, biodiversity conservation, and improve public health, it is crucial to reduce meat consumption and replace the intake of animal protein with plant protein. However, the interactions and structures, also known as the food matrix, of novel extracted plant proteins and fibers remain unexplored. Therefore, it is essential to study the impact of high protein plant1based foods and the effect of the food matrix on human health. Thus, this study aims to investigate the impact of fiber-protein interactions on plant protein digestion and metabolization.

METHODS
Seventeen participants with high risk for metabolic syndrome were recruited to eat three study products: Product A) Granola containing plant-based protein (10 g) with intrinsic fiber (17 g), meaning naturally occurring fiber within the undisrupted plant cell wall, Product B) porridge containing plant-based protein (10 g) with extrinsic fiber (17 g), meaning added fiber extracted from a plant cell wall, and Product C) cereal control product with minimal protein (2 g) and fiber (0.8 g). Plasma insulin, glucose, free fatty acids and triglycerides were measured at timepoints 0, 30, 60, 90, 180, and 240 minutes after ingesting the meal. The in vitro digestion of the products was done according to the INFOGEST protocol with minor modifications. In vitro degree of protein hydrolysis was calculated based on released amino groups in o-phthalaldehyde (OPA) measurement.

RESULTS
Plasma glucose and insulin levels were lower after ingestion of product B (6.66 ± 0.24 and 53.25 ± 8.24) compared to A (7.64 ± 0.43 and 81.79 ± 11.67) ($p = 0.0091$ and <0.001, respectively). These RESULTS suggest that the availability of protein and fiber varies depending on the food matrix, where the intrinsic fiber reduced the absorption of glucose that was shown as lower plasma concentrations. The in vitro analysis showed that Product B had a higher amount of free amino groups both before and after digestion. However, during digestion, Product A released free amino groups more quickly, though its total amount of free amino groups remained lower overall. This suggests that Product A undergoes faster initial protein breakdown, while Product B demonstrates a slower but overall, more efficient digestion process.

CONCLUSIONS
These differences in protein breakdown kinetics and fiber-protein interactions may be contributing to the lower glycemic response caused by plant-based protein with extrinsic fiber.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_171

YOUTH ON THE PATH TO SUSTAINABLE EATING: UNVEILING BARRIERS AND FACILITATORS THROUGH FOCUS GROUP INSIGHTS

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BACKGROUND AND OBJECTIVES
The current food system plays a significant role in driving climate change, highlighting the urgent need for populations to adopt more sustainable food behaviours. Engaging young people in this shift is crucial, as dietary habits formed during adolescence often persist into adulthood, influencing the long-term transition to sustainable eating. To examine the factors that hinder or support the development of sustainable food behaviours among youth, we conducted focus group discussions guided by the Capability-Opportunity-Motivation-Behaviour (COM-B) model.

METHODS
Eleven focus group discussions were conducted with participants aged 12 to 16, recruited through football clubs in the Utrecht region, the Netherlands. Each group consisted of five to twelve participants and explored three key sustainable food behaviors: adopting a plant-forward diet, increasing the consumption of locally sourced and seasonal foods, and reducing food waste.

RESULTS
Adopting a plant-forward diet emerged as the most challenging behavior, while minimizing food waste was already seen as a common practice. Participants demonstrated a general awareness of sustainability and sustainable food, but misconceptions were common. The majority believed that meat is essential for health and that sustainable foods are more expensive. The taste of meat was cited as a key barrier to embracing plant-forward diets. Social influences played a substantial role, with family practices shaping eating habits and participants having limited autonomy over food choices. While most participants expressed a belief in the collective impact of sustainable eating and acknowledged its importance, they struggled to see its relevance on an individual level.

CONCLUSIONS
While reducing food waste is already normalized among youth, shifting towards a plant-forward diet presents significant challenges but also holds the greatest potential for meaningful change. Addressing misconceptions, promoting tasty alternatives, and empowering youth to feel personally connected to sustainable eating could pave the way for a broader transition.

CONFLICTS OF INTERESTS
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EPO2_173

INVESTIGATING THE DIFFERENCE BETWEEN MORE SUSTAINABLE PLANT-BASED PROTEINS AND ANIMAL-BASED PROTEINS ON INTESTINAL BARRIER FUNCTION USING IN VITRO MODELS

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BACKGROUND AND OBJECTIVES
A more sustainable future requires a transition towards a plant-based diet due to the exhaustive effects animal-based proteins have on the environment. However, plant-based proteins generally have a lower variety in essential amino acid composition. Additionally, their structure RESULTS in proteins that are more difficult to digest and subsequently tend to end up lower in the digestive tract, making them prone to fermentation by the microbiome. This proteolytic fermentation can cause production of metabolites associated with negative health effects and additionally resulting in shortages in protein uptake. Proteolytic fermentation can potentially be steered towards more saccharolytic fermentation through the addition of non-digestible carbohydrates in the diet. Knowledge on this combination of plant-based proteins and non-digestible carbohydrates on colonic- and general health is limited. Current data suggest that a transition towards a more plant-based protein diet should be accompanied with a consumption of increased quantities and more complex structures of carbohydrates. This can reduce or prevent proteolytic fermentation which might consequently improve human health.

METHODS
We investigated the effect of combining plant-based proteins from fava bean, potato and pea and egg as an animal-based control and non-digestible carbohydrates inulin and pectin on IL-8 secretion and *TFF3*, *MUC2*, *GUSB*, *CHST5*, *GAL3ST2* and *MUC13* expression in intestinal mucus producing goblet cells. In addition, we treated these cells with different stressors (Tunicamycin, IL-13 and TNF- α) and IL-8 production in the supernatant was measured. Additional experiments are ongoing on the effect of these samples on Trans-Epithelial Electrical Resistance (TEER) and accompanying influence on gene expression.

RESULTS
Preliminary RESULTS show that cells treated with the animal-based control (egg) fermentation samples shows different RNA expression profiles as compared to the plant-based protein (fava bean) fermentation samples. TEER experiments will yield more information regarding barrier integrity and gene expression.

CONCLUSIONS
Supplementing plant-based proteins with non-digestible carbohydrates might help reducing the proteolytic fermentation that is generally associated with a more plant-based diet. Reducing the amount of proteolytic fermentation will help in the transition towards a more sustainable (plant-based) diet that is still nutritionally complete.

CONFLICTS OF INTERESTS
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EPO2_175

SUSTAINABILITY INDICATOR FRAMEWORK FOR COMMUNICATING RESPONSIBLE AQUAFOOD CONSUMPTION

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BACKGROUND AND OBJECTIVES
VeriFish (project no. 101156426) has developed a comprehensive indicator framework for the aquafood sector, addressing environmental, stock management, and nutritional dimensions. This initiative aims to simplify and standardise communication, fostering informed consumer choices and enhancing transparency. By integrating verifiable data into actors' communication strategies, the framework seeks to promote responsible consumption patterns, ensure the sustainability of aquafood systems, and support good communication practices tailored to diverse stakeholder needs.

METHODS
The indicators were identified through systematic review, focusing on core dimensions such as stock status, ecosystem impacts, climate footprint, governance, and nutritional attributes. The framework employs a tiered data approach: Tier 1 uses publicly available data ensuring broad availability, while Tier 2 incorporates value-chain-specific data to provide detailed, granular insights. This dual approach ensures flexibility and relevance across diverse operational contexts, facilitating adoption and integration by both small-scale and large-scale actors in the value-chain.

RESULTS
The framework provides measurable indicators for capture fisheries, aquaculture, and nutrition, enabling assessment of key sustainability metrics such as biodiversity conservation, carbon emissions, resource efficiency, and public health. These indicators form the basis of a prototype web application that will facilitate communication of sustainability by actors and enable consumers to make more informed decisions based on their priorities, such as environmental impact, nutritional quality, or responsible production.

CONCLUSIONS
By standardising sustainability reporting and enhancing value-chain communication, the VeriFish framework enables aquafood actors to align with global environmental and health objectives. Potentially, it can foster consumer trust and empowerment, promote responsible 'advertising' practices, and pave the way for diverse, sustainable consumption. This framework represents a step toward a more transparent, equitable, and environmentally responsible aquafood sector, benefiting producers, consumers, and the environment alike.

CONFLICTS OF INTERESTS
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EPO2_176

MAPPING STAKEHOLDERS INFLUENCING NEGLECTED UNDER-UTILIZED SPECIES (NUS) INCORPORATION INTO GHANA'S SCHOOL FEEDING PROGRAM

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BACKGROUND AND OBJECTIVES

Neglected Under-Utilized Species (NUS), indigenous climate-smart crops of Ghana, offer potential benefits for local agriculture, dietary diversity, and sustainable food systems if integrated into the Ghana School Feeding Programme (GSFP). This study examines the influence of national stakeholders on this integration process, recognizing that understanding stakeholder dynamics is crucial for effective implementation.

METHODS

In-person Net-Map interview was conducted with 14 representatives (10 females; 4 males) from the GSFP ecosystem. The interview audio-recording was transcribed verbatim and used in data entry in addition to the maps drawn. Ethical clearance was obtained, and informed consent was sought from all participants. Data analysis used VisuaLyzer version 2.2.

RESULTS

Sixty-eight stakeholders from nine categories were identified, connected by 730 links; formal command, technical assistance, funding, advocacy, and evidence dissemination. The network had a degree centralization of 70%, with 15 core and 53 peripheral actors. The network's density was 0.32, with an average stakeholder distance of 1.88. Government, academia, and development partners were the most influential groups, each scoring the highest influence level.

CONCLUSIONS

This study reveals the central influence of government, research/academia, and development partners on NUS integration into the GSFP. The identified stakeholder network provides a practical tool for policymakers, highlighting key actors to engage for successful and sustainable NUS incorporation into school meals, ultimately contributing to food system transformation.

CONFLICTS OF INTERESTS

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EPO2_178

HOW EXTREME TEMPERATURES ARE ASSOCIATED WITH MEASURES OF BREASTFEEDING AND CHILD NUTRITION IN GHANA

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BACKGROUND AND OBJECTIVES

Progress on key breastfeeding and nutrition indicators are lagging across the world, with only 6 countries in Africa on course to meet childhood stunting targets (Global Nutrition Report). Climate change threatens progress made to date, as droughts and extreme temperatures lead to food insecurity and may shift infant feeding practices such as breastfeeding (IPCC 2023). Studies suggest that exposure to droughts may have adverse effects on feeding practices, for example reducing dietary diversity (Pinchoff et al, 2021), and also affecting anthropometric measures of nutritional status (Belesova et al, 2019). Our objectives are to integrate survey and satellite derived climate data to determine the association between heat, drought, and key nutritional outcomes among children in Ghana.

METHODS

Using the 2022 Ghana Demographic and Health Survey, we calculate indicators of child nutrition behaviors and nutritional outcomes (n=5,045 children under 5). Child health data is then integrated with remotely sensed data on maximum temperature and a measure of drought (normalized difference in vegetation index, NDVI). Child nutrition measures include exclusive breastfeeding among children under 6 months of age, stunting and wasting among children under 2 years, anemia, and measures of minimum dietary diversity, minimum meal frequency, and minimum acceptable diet for children ages 6-23 months. Our models adjust for key demographic factors such as income level, mother's educational attainment and household size. We also adjust for livelihood zone to reflect different household strategies for income and reliance on natural resources.

RESULTS

We have preliminary RESULTS, finding a strong association between extreme temperatures in the previous month with wasting and undernutrition (but not stunting). We also find that a higher proportion of hot days and heat waves days reduces the probability of meeting minimum dietary diversity guidelines, though an association with meal frequency was not found. With higher maximum temperatures and more hot days, we see a lower odds of currently breastfeeding, though the association with exclusive breastfeeding is less clear.

CONCLUSIONS

Our RESULTS suggest that extreme temperatures can affect measures of nutritional outcomes and child feeding behaviors, particularly short term nutritional indicators such as wasting. Our findings can inform nutrition policy to ensure consideration of climate risks, and improve targeting of programs to adjust for environmental changes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_179

REDUCED RANK REGRESSION DERIVED DIETARY PATTERNS EXPLAINING INDICATORS OF ENVIRONMENTAL SUSTAINABILITY IN ADOLESCENT DIETS: ANALYSIS IN THE GERMAN DONALD COHORT STUDY

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BACKGROUND AND OBJECTIVES
Shifting to dietary patterns that benefit human and planetary health is largely needed. We aimed to derive real-world dietary patterns that best explain variations in dietary greenhouse gas emissions (GHGE), land use (LU), and water use (WU) in adolescent diets, and their associations with nutrient adequacy.

METHODS
We analyzed dietary data of 415 adolescents (females: 9-15y, n=199; males: 10-16y, n=216) with at least two 3-day-weighed dietary records (n=2141; 2-7 per participant, median: 6) from the ongoing open DONALD (DOrtmund Nutritional and Anthropometric Longitudinally Designed) cohort study. A total of 23 food groups as well as GHGE, LU, and WU were assigned to all recorded foods. Reduced rank regression models with GHGE (kgCO2eq), LU (m² x year), and WU (L) per 1000kcal as response variables and consumption of food groups (g/1000kcal) as predictor variables were used to derive the dietary patterns. The Mean Adequacy Ratio (MAR = ∑(nutrient intake/recommended intake)/number of nutrients) was used to represent nutrient adequacy. Associations between the MAR and the dietary patterns were analyzed using multivariable linear regression models.

RESULTS
The first two dietary patterns (DP1, DP2) cumulatively explaining 10.1% variation in dietary intake and 68.5% joint variation in GHGE, LU, and WU were used. DP1 loaded positively for beef and lamb, pork, poultry, and ready-to-eat foods, and negatively for milk and grain products. DP2 loaded positively for vegetables, fruits, fruit and vegetable juices, and nuts and seeds, and negatively for milk, sweets and pastries, and ready-to-eat foods. DP1 was positively associated with GHGE, LU, and WU. DP2 was positively associated with WU and negatively with GHGE and LU. A higher MAR was associated with higher adherence to DP2 (ß=2.04, 95%CI: 1.42-2.67, p<0.0001). No significant association was found for MAR and DP1 (ß=0.2, 95%CI: -0.49-0.88, p=0.569).

CONCLUSIONS
Higher adherence to a more plant-based dietary pattern, which was characterized by lower GHGE and LU, but higher WU, was associated with higher nutrient adequacy. Adherence to a more animal-based dietary pattern showed no association with MAR.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_180

ADEQUACY TO THE PLANETARY HEALTH DIET OF CURRENT DIETARY HABITS IN ITALIAN ADULTS

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BACKGROUND AND OBJECTIVES
The Planetary Health Diet stands out as a dietary model suggested to merge both health benefits and environmental sustainability. However, only a limited number of studies have applied such a model to current dietary habits, while there is no univocal agreement on the most valid method to assess it. The aim of this study was to measure the adequacy to the Planetary Health Diet of current dietary habits in Italian adults.

METHODS
The dietary habits of 2000 individuals living in southern Italy were explored through a validated 110-item food frequency questionnaire. Adequacy to the Planetary Health Diet was assessed via application of five different scores already used in scientific literature. Validity for nutrient content was evaluated by estimating the macro- and micronutrient dietary composition. Also, the relation with level of food processing was investigated. Validity of environmental impacts was explored by estimating carbon and water footprint data. Energy-adjusted linear regression models were used to assess the associations between the scores, dietary content, and environmental impacts.

RESULTS
All scores predicted an adequate consumption of plant omega-3 polyunsaturated fatty acids (PUFA), total fiber, potassium, vitamin A, E, and C as well as lower intake of sodium and fats, including cholesterol and saturated fatty acids. However, protein, mono-unsaturated fatty acids (MUFA) and total PUFA intake resulted inversely associated with some but not all scores applied, revealing a different predictability of the tools used. When assessing the relation bewteen scores and the energy shares of ultra-processed foods (UPF), RESULTS showed an inverse association with all scores (mainly due to lower consumption of fast foods, biscuits/pastries/cakes and ice-cream). Concerning the relation with the environmental impacts, the increase in all scores was significantly associated with reduction of both environmental measures, with a difference by about 1.0 Kg CO2 eq./day and 100 L/day of greenhouse gas emission and water use between the extreme categories, respectively.

CONCLUSIONS
The application of a diet in line with the proposed Planetary Health Diet to the southern Italian population may reflect a lower environmental impact and a good nutritional quality diet. However, some concerns regarding an appropriate adequacy of protein intake as well as certain nutrients should be taken into account. Also, the tools used to assess the adequacy to the Planetary Health Diet may require an adaptation to improve their performance.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_182

SAFETY, TOLERABILITY, AND PRELIMINARY EFFECTS OF CRICKET CHITIN FOR IBS: A RANDOMIZED CROSSOVER TRIAL

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BACKGROUND AND OBJECTIVES

Background: Inflammatory bowel syndrome (IBS) is a gastrointestinal disorder affecting around 11% of the global population. Increased inflammatory mediators and altered gut microbiota are prevalent in IBS and may contribute to its' pathophysiology. Thus, sustainable dietary fiber sources accessble on a global scale are being investigated for their ability to improve functional gastrointestinal symptoms by remediating gut microbiota and reducing intestinal inflammation.

Objective: This study aims investigate the safety and tolerability of a unique and sustainable fiber source, cricket-derived chitin, in a sample of adults (n=18) diagnosed with IBS, as well as gather preliminary data regarding IBS management.

METHODS

Methods: In this randomized, double-blind, 2x2 crossover trial, participants consumed cacao patties containing either 4 grams of cricket-derived chitin (n= 10) or a maltodextrin comparator (n= 8) daily for 30 days, followed by a 14-day washout period and additional 30-day intervention period in the opposite treatment group. Assessments of the primary outcome of safety and tolerability (e.g., adverse events, metabolic biomarkers, quality of life) and secondary outcomes (e.g., inflammatory biomarkers, gastrointestinal symptoms, stool consistency, and gut microbiota) occurred before and after each intervention.

RESULTS

RESULTS: Saftey and tolerability outcomes were met; No serious adverse events, shifts in metabolic biomarkers outside normal range, or reduced quality of life were observed. While participants reported improved GI symptoms following both treatments ($p<0.05$), the relationship was more pronounced following the chitin intervention ($p<0.01$); The decrease in the inflammatory biomarker serum TNF-alpha was also significantly greater following the chitin intervention.

CONCLUSIONS

Conclusion: RESULTS suggest that while both chitin and cacao may be safe and tolerable in an IBS population and support symptom management, the chitin additive may provide an additional benefit for lowering inflammatory cytokines.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_184

SUSTAINABILITY IN DIETETICS: A DIETETIC SURVEY INVESTIGATING THE REUSE OF PLASTICS AND ANCILLARIES WITH TUBE-FED PATIENTS IN THE UK

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BACKGROUND AND OBJECTIVES

The UK National Health Service (NHS) has set a goal to reduce single-use plastics where clinically appropriate, as part of meeting their ambitious net zero emissions goal [1]. Recent data [2] indicates that tube feeding plastics can be safely used over a 24-hour period without risk of bacterial contamination if handled properly. However, current practice involves high volumes of single use plastics [3]. Therefore, this study aimed to investigate current practice of reusing enteral tube feeding plastics across different patient groups and understand what drives this.

METHODS

The online surveyof enteral tube feeding dietitians recorded patient demographics, and plastic reuse over 24-hours during gastric/jejunal feeding, with decanted/commercial feeds. Qualitative questions on barriers and enablers of plastic reuse were asked and analysed using a coded frame as described by SAGE [4]. SPSS was used for statistical analysis, with *chi*-squared used to compare the plastic reuse between different groups.

RESULTS

A total of 58 dietitians from community and hospital settings responded, working with adults (83%), children (12%) or both (5%). Plastic reuse was reported in 45% of adults and children, but only 22% in infants (<1 year) ($p<0.05$). Additionally, plastic reuse was 42% when using commercial feeds, but only 27% with decanted feeds ($p<0.05$). 95% of dietitians listed microbiological contamination as a top 3 consideration, followed closely by home environment hygiene (88%) and patient convenience (52%). Thematic RESULTS showed top barriers to reuse were policy/guidance, patient choice, historic use and lack of education. Top enablers for reuse were environmental concern, cost, hospital guidance, and manufacturer training. Dietitians reported that current guidance on plastic reuse was varied, with sources being: ‘Plastic Manufacturer’ (69%), ‘Local Infection control’ (51%), ‘Feed Manufacturer’ (51%), ‘PENG’ (31%) and ‘NICE guidance’ (31%).

CONCLUSIONS

To meet the NHS’s ambitious net zero goals, change is required, with only relatively low numbers of patients reusing tube feeding plastics, particularly due to microbiological concerns. Focus on educating staff and patients on safe methods for reusing plastics, while highlighting the environmental benefits could improve tube feeding plastic reuse within the NHS, having both cost and sustainability benefits.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_185

BRIDGING SILOS: A NEXUS FRAMEWORK FOR INTEGRATING NUTRITION, CLIMATE, AND GENDER TO BUILD RESILIENT FOOD SYSTEMS

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BACKGROUND AND OBJECTIVES
Background: Nutrition, climate, and gender are critical global challenges, particularly in the Global South, where they shape food security and sustainability. Despite extensive research, interventions remain siloed, failing to address their interconnectedness.
Research Gap & Objective: Existing approaches primarily link two dimensions at a time, overlooking key interdependencies. This study develops a three-dimensional "Nexus Framework" to integrate nutrition, climate, and gender, guiding holistic policy responses and cross-sector collaboration.

METHODS
Methodology: A structured three-round framework analyzed bidirectional relationships. The first round examined nutrition's influence on gender equity and climate resilience. The second assessed climate change's impact on food security and gender disparities. The third evaluated gender-responsive policies in nutrition and climate adaptation. Findings were synthesized to identify key linkages and policy insights.

RESULTS
RESULTS: Siloed approaches hinder systemic efficiency. Climate disruptions disproportionately affect women's nutrition, exacerbating gender inequalities. Resource-intensive diets increase emissions, while gender-sensitive agricultural strategies enhance resilience. Gender-responsive interventions strengthen food security, improve environmental sustainability, and mitigate climate risks. Integrated approaches lead to more effective adaptation strategies and long-term resilience-building across sectors.

CONCLUSIONS
CONCLUSIONS & Policy Implications: The Nexus Framework provides a transformative model for integrating nutrition, climate, and gender. Dual-dimensional strategies are insufficient. Policies must incorporate gender-equitable, nutrition-sensitive strategies in climate action plans. Empowering women strengthens resilience and food security, while sustainable diets lower emissions. This framework helps policymakers amplify co-benefits and build equitable, sustainable food systems.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_186

ENHANCING WHEAT TOLERANCE TO DROUGHT STRESS USING BACTERIAL EXOPOLYSACCHARIDES

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BACKGROUND AND OBJECTIVES
Drought stress is one of the main factors limiting plant growth and productivity, disrupting their metabolic and physiological processes. The use of exopolysaccharides (EPS) produced by rhizobacterial strains represents a promising strategy to enhance plant tolerance. This study aimed to evaluate the effectiveness of EPS from strains *Bradyrhizobium cytisi* (B21) and *Rhizobium sullae* (BG15) in mitigating the effects of drought stress on wheat germination.

METHODS
Wheat seeds were germinated in Petri dishes for 10 days under drought stress induced by PEG-6000 at concentrations of 10% and 15%. EPS were applied at two concentrations (0.5 mg/mL and 5 mg/mL) during the germination process. Morphological parameters, including fresh and dry weight, were measured. Biochemical analyses were conducted to evaluate protein content, proline content, soluble sugars, and α-amylase activity.

RESULTS
Drought stress significantly reduced morphological parameters, including fresh and dry weight, in wheat plants. However, the application of EPS mitigated these effects. At a concentration of 5 mg/mL, fresh and dry weights were restored to levels close to non-stressed controls, demonstrating the protective effect of EPS. Biochemical analyses revealed notable improvements in key stress markers: protein content increased to 1.2 mg/g FW, while proline content rose to 30 µg/g FW, indicating enhanced osmotic adjustment. Additionally, the stabilization of soluble sugar levels and α-amylase activity further highlighted the capacity of EPS to support metabolic stability under stress.

CONCLUSIONS
The RESULTS confirm the protective role of EPS from B21 and BG15 strains in mitigating the negative effects of drought stress. EPS significantly improve metabolic stability and promote better tolerance in wheat plants under water stress conditions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_189

DESIGN AND PRODUCTION OF A FUNCTIONAL AND SUSTAINABLE FOOD FOR THE NUTRITION OF MIGRANT COMMUNITIES: A PILOT STUDY

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BACKGROUND AND OBJECTIVES

Around of 9% of the total population in the world suffers hunger, and more than 582 million people are expected to suffer from chronic malnutrition by 2030. In Mexico and the world, a third of food is wasted (FAO 2023). In 2020, 3.6% of the world population were migrants, with Mexico being the 2nd country with the highest number of migrants (IOM 2020). The migrant population suffers from food insecurity, malnutrition and related diseases (FAO 2025). This pilot study aimed to design and produce a functional and sustainable food, low cost, custom-developed for an immigrant community to guarantee an adequate nutritional status during their journey to the final destination. Preliminary findings highlight the potential of this strategy to improve food security and well-being of populations in transit.

METHODS

A pilot study was carried out in which a clinical nutritional evaluation and an interview about eating habits and lifestyle were carried out with 16 migrants in transit. Based on the RESULTS obtained (nutritional needs and displacement conditions) the functional food (FF) was designed and produced. In a later phase, the FF will be produced on a large scale and distributed for free to migrants in transit; additionally we will teach the staff of a migrant shelter how to produce it, so that they teach the migrants and produce it continuously.

RESULTS

16 individuals who participated voluntarily, under informed consent, were evaluated. 62.5% were female and 37.5% male, aged between 18-70 years. According to the BMI, 7.1% were underweight, 50% normal weight, 7.1% overweight and 35.7% were obese. The main food source reported was rice or bread (25%), with limited availability of sources rich in protein. 50% reported weight loss since the beginning of their trip.

CONCLUSIONS

Food insecurity in the migrant population is linked to malnutrition. The migrant population faces limited access to rich sources of protein. The formulation of the FF developed in this study allows us to cover a significant part of the caloric and essential nutrient requirements of a day. The implementation and distribution of this FF has the potential to improve the health and well-being of migrants in transit, contributing to reducing the adverse effects of food insecurity in this vulnerable group, supporting SDGs 2, 3 and 12.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

1. International Organization for Migration, OIM 2023.
2. United Nations Organization, ONU 2023.
3. Food and Agriculture Organization, FAO 2023.

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EPO2_190

"NUTRIR +: A SUSTAINABLE MODEL FOR THE PRODUCTION OF PERSONALIZED FUNCTIONAL FOODS IN VULNERABLE COMMUNITIES"

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BACKGROUND AND OBJECTIVES
Globally, approximately 9% of the population suffers from hunger, and it is estimated that over 582 million people will experience chronic malnutrition by 2030 (FAO, 2023). Limited economic access to healthy diets remains a critical issue, affecting more than one-third of the global population (PAHO, 2023). Simultaneously, one-third of food produced in Mexico and worldwide is wasted (FAO, 2023). The aim of this study was to design and produce personalized functional foods (PFF) for vulnerable communities (VC), using ingredients sourced from food bank donations before being discarded.

METHODS
The "Nutrir +" project has been carried out annually since 2016, benefiting more than 700 people from VC in Mexico. The methodology consisting of the following phases: a)Nutritional assessment, b)Diagnosis: Nutritional deficiencies and key factors affecting food security, c)PFF design, d)Local food donations, e)Production, f)Distribution & training: The PFF is distributed, along with the RESULTS from a/b phases. Additionally, managers and kitchen staff training is conducted to enable the continuous production of the PFF, ensuring the project's long-term sustainability.

RESULTS
The "Nutrir +" methodology has been successfully replicated annually: 1) 2016, Functional soup for older adults; 2) 2017, Energy balls for migrants, 3) 2018 Functional candy for children, 4) 2019 Functional frozen popsicles for women with breast cancer, 5) 2020 Functional donuts for elderly, 6) 2023 Functional candy for children, 7) 2024 Energy bites for migrants in transit. Of the 7 VC involved, 3 continue to independently producing the PFF.

CONCLUSIONS
The methodology "Nutrir +" has been effective and replicable contributing to SDGs 2, 3, 12, and 13. The 43% of the VC have maintained autonomous production of PFF, highlighting the project's long-term sustainability. "Nutrir +" provides a scalable model to enhance food security and well-being in VC, with potential for expansion to other contexts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

1. Department of Economic and Social Affairs Sustainable Development, WHO 2024.
2. Pan American Health Organization, PAHO 2023.
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EPO2_191

INVESTIGATING LIVED EXPERIENCES OF FRUIT AND VEGETABLE ACQUISITION IN THE FOOD ENVIRONMENT OF ZIGUINCHOR, SENEGAL

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BACKGROUND AND OBJECTIVES

Climate change, high rates of urbanisation and price inflation have modified traditional dietary patterns, especially among vulnerable populations who already experience food insecurity and malnutrition. This study aimed to understand the lived experience of the food environment among consumers from low-socioeconomic neighbourhoods in Senegal, specifically in relation to fruit and vegetable (F&V) acquisition as essential components of sustainable and healthy diets.

METHODS

Adults >18 years from a low socioeconomic neighbourhood of Ziguinchor were recruited by convenience sampling. Focus group discussions (FGDs) (n=4), participatory mapping, and participatory photography activities were implemented to investigate drivers of F&V acquisition practices. Data collection took place during the rainy season of 2022. Coding and analysis of transcripts, maps and photographs was conducted in NVivo14 software, informed by the Turner et al., (2018) food environment framework to capture dimensions of the external and personal food environment that shape food acquisition and consumption practices. Additional *in-vivo* themes emerging from the data were also included in an iterative process.

RESULTS

FGD participants (n=42) included food vendors, including vendors of prepared meals (e.g. couscous) and small-scale F&V vendors – with the majority being female (76%). Key drivers of food acquisition practices included high food prices and limited seasonal availability during the rainy season. Infrastructural challenges restricting transportation and mobility and the limited affordability of vegetables were emphasised narratives in the participatory photography activity. Participants called for improved accessibility and affordability of vegetables used in traditional meals, which were often forgone to purchase staple food items like rice, oil and fish. Participants recommended investment in the built environment (e.g. roads and market infrastructure) in addition to food environment policies to regulate food prices and reduce intra-annual price variation.

CONCLUSIONS

This study contributes to growing evidence on urban food environments in Africa and how they shape F&V acquisition and consumption practices. Policies to improve the built environment are needed to increase the accessibility and affordability of sustainable and healthy diets among consumers in low-income neighbourhoods in Senegal, particularly during rainy seasons when food environment challenges are exacerbated.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO2_193

BRIDGING THE GAP: ASSESSING CHILD HUNGER AND MALNUTRITION IN NATIONAL CLIMATE STRATEGIES UNDER THE PARIS AGREEMENT

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BACKGROUND AND OBJECTIVES
The Paris Agreement mandates periodic updates to Nationally Determined Contributions (NDCs), which outline countries' climate action plans. However, children—who are disproportionately affected by climate change, mainly through hunger and malnutrition—are often overlooked in these strategies. This review, conducted with a sense of urgency, assesses the integration of child hunger and malnutrition into NDCs and National Adaptation Plans (NAPs), identifying key gaps, evaluating current commitments, and exploring advocacy opportunities. The objectives were to examine child-specific considerations, pinpoint policy deficiencies, and propose strategies to enhance child-sensitive climate action.

METHODS
Desk research was conducted on NDCs and NAPs from countries where World Vision operates. Proxy indicators, including stunting, wasting, and food security measures, were used to assess the integration of child hunger and malnutrition into climate strategies. The analysis categorized commitments and actions by specificity, budgets, and timelines while examining the extent of child participation in NDC development processes.

RESULTS
The review revealed substantial gaps in addressing child-specific issues within climate frameworks. While 85.9% of regions acknowledged hunger and malnutrition, only 65.9% included measures targeting child hunger and malnutrition. Child participation in NDC processes was notably low (31.8%), and no country explicitly identified child hunger as a critical issue.

Region	Action on Hunger (%)	Action on Child Hunger (%)	Child Participation (%)
East Asia	100	75	37.5
Latin America & Caribbean	100	93.3	46.7
Southern Africa	55.6	22.2	11.1

CONCLUSIONS
This study highlights gaps in addressing child hunger and malnutrition in climate plans. Proposed strategies could bring positive impacts. Advocacy should prioritize child-sensitive policies, budgets, and participation. These findings can be used to push for more substantial government commitments to address children’s needs in NDCs and NAPs

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_194

DETERMINANTS OF FOOD CHOICE MOTIVES AMONG ADULTS IN A UNIVERSITY SETTING: THE ROLE OF SOCIODEMOGRAPHIC AND ANTHROPOMETRIC FACTORS

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BACKGROUND AND OBJECTIVES
Food choices is complex and influenced by many motivating factors. Therefore, understanding factors behind food choices may be important in designing dietary interventions aimed at improving human health as well as environmental sustainability. The aim of this study to explore food choice motives and to identify whether sociodemographic and anthropometric factors influence them in adults at UAEU community.

METHODS
The English and Arabic-adapted versions of the Food Choice Questionnaire (FCQ) were used to measure FCMs. Mann-Whitney U and Kruskal Wallis tests were utilized to compare differences in FCMs among 894 adults with varying sociodemographic and anthropometric factors. Further analysis was conducted using multiple linear regression.

RESULTS
Sensory appeal emerged as the most important food choice motive, followed by price, convenience, and health motives, whereas familiarity and eco-ethics were ranked as the least important. Statistically significant differences in FCMs were observed among adults based on sociodemographic and anthropometric factors ($p < 0.05$). However, a small proportion of the variability in FCMs (3.7% - 12.6%) was explained by the sample characteristics included in the multivariate analysis. Gender was the most consistently associated factor with variations in FCMs. Specifically, females rated all FCMs, except for price, as significantly more important compared to males.

CONCLUSIONS
Food choices among adults are shaped by several factors, with sensory appeal being the most important motive. Future interventions targeting health and environmental sustainability should align with adults' sensory preferences. Although sociodemographic and anthropometric factors influenced FCMs in a limited extend, they should still be considered in tailored interventions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO2_195

SHIFTING FROM DAIRY MILK TO PLANT-BASED MILK ALTERNATIVES: IMPACT ON % DAILY VALUES ON MACRONUTRIENTS

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BACKGROUND AND OBJECTIVES
With the growing demand for plant-based milk alternatives (PBMiA), there is a need to assess the nutritional profile and its impact on the % daily values (%DV) of nutrients to maximize the potential benefits of shifting from dairy milk (DM) to PBMiA. This study measured the impact on the %DV per macronutrient per age group with the substitution of PBMiA (i.e., cereal-based = CEB; coconut-based = COB; legume-based = LEB; nut-based = NUB) to DM.

METHODS
Nutritional information from labels of PBMiAs and DM sold in Metro Manila, Philippines was collected. The %DV for each macronutrient was calculated per age group as categorized in the Philippine Dietary Reference Intakes (PDRI).

RESULTS
RESULTS showed the %DV for energy will significantly decrease ($p<0.05$) by 0.49-2.14% if adults shift to PBMiA, except when CEB is consumed by male adults. Similarly, energy %DV for children will significantly decrease ($p<0.05$) by 2.22-2.48% when DM is substituted by NUB. The %DV for protein and fat for all groups will significantly decrease ($p<0.05$) by 1.06 - 9.67% and 2.06 - 5.00%, except when LEB and COB are consumed by male children, respectively. Meanwhile, the %DV dietary fiber will increase significantly ($p<0.05$) by 1.78 - 5.23% for all groups except for COB and NUB consumption of male and female adults.

CONCLUSIONS
These shifts in %DV indicate potential health implications, including increased dietary fiber but reduced energy, fat, and protein intake, underscoring the need for nutritional balance when adopting sustainable, alternative diets through PBMiA consumption.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3 - Food science, gastronomy and life quality

EPO3_001

STUDIES ON THE ENRICHMENT OF Γ-AMINOBUTYRIC ACID IN AMAZAKE BY LACTIC ACID FERMENTATION

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BACKGROUND AND OBJECTIVES
It has been reported that continuous intake of foods rich in γ-aminobutyric acid (GABA) provides tranquilizer and hypotensive effects. For example, in the case of defatted rice germ enriched with GABA, intake of 9 g (GABA 26.4 mg)/day for 8 weeks was observed to improve sleeplessness and depression during the menopause or presenile period.1) Also, in a GABA-enriched fermented milk drink, hypotensive effects have been confirmed by intake of 100 ml (GABA 10 mg)/day for 4 weeks or more, and it is marketed as Food for Specified Health Uses(FOSHU) in Japan.2) In this study, we investigated lactic acid fermentation by *Lentilactobacillus buchneri* TS-25 strain in order to enrich GABA in *Amazake* (made by saccharifying rice with *rice-koji*), a traditional and popular beverage in Japan.

METHODS
Amazake was prepared according to the conventional method. Specifically, washed rice was watered and heat gelatinised (90°C, 30 min), then *rice-koji*(neutral protease activity: 33 units/g) was added at 55°C and followed by saccharification for 18 h (control). On the other hand, in the lactic acid fermentation, after adding *rice-koji*, the TS-25 strain was inoculated at 35°C, followed by saccharification and fermentation in parallel for 18-42 h(test). Some of them were picked over time (after 18, 24 and 42 h) and analysed quantitatively by HPLC (labelling with NBD-F) for free glutamic acid (L-Glu) generated by *rice-koji* and GABA converted by the TS-25 strain. The weight of the supernatant collected by centrifugation (12,070 x g, 15 min) of the *Amazake* was used as the liquefaction rate (%).

RESULTS
In the control, the saccharification at 55°C, 18 hours, yielded 62 mg/100 g of L-Glu, but only 6 mg/100 g of GABA. On the other hand, in the test, saccharification and lactic acid fermentation at 35°C, 42 hours yielded 83 mg/100 g of GABA, while L-Glu was reduced to 4 mg/100 g. The liquefaction rate (%) was similar in the control and test, 76.9% and 76.7%, respectively, and the liquid state was suitable for beverages.

CONCLUSIONS
As a result of applying lactic acid fermentation by *Lentilactobacillus buchneri* strain TS-25 to the manufacturing of *Amazake*, GABA increased more than 13-fold(6 mg → 83 mg/100g), while L-Glu, which has antagonistic effects, was reduced to less than 1/15 (62 mg → 4 mg/100g). The resulting lactic acid fermented *Amazake* provided 10 mg of GABA in just 13 g of drinking, thus contributing to a reduction in calorie intake. In addition, it had a sweetness and sourness close to that of sweetened yogurt (lactic acid content around 660 mg/100 g), making it suitable for daily enjoyment as an animal-free yogurt-like beverage.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_003

ALTERNATIVE USE OF GRAIN AND LEGUME FLOURS IN MUFFIN-MAKING: A SENSORY ANALYSIS FROM CONSUMER POINT OF VIEW

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BACKGROUND AND OBJECTIVES
Legumes, which are a sustainable alternative protein source with high energy and nutrient density, can be used in various ways beyond meal preparation. The aim of the study was to evaluate legume flours used in muffins as an alternative to grain flours.

METHODS
Muffin samples were prepared by eight fours; 3 grains (wheat, buckwheat, and whole wheat) and 5 legumes (lentil, chickpea, white sorghum, black gram, and bean) by standard recipe. The grain and legume muffins were evaluated in terms of physical property analysis (baking loss (%) and baking volume (mm)), sensory analysis and nutritional value (energy, carbohydrate, protein, fat, fiber, calcium, magnesium, iron, and zinc). Sensory analysis were evaluated according to taste, flavour/aroma, colour, internal texture and overall acceptability by the panellist (10 cm VAS scale and hedonic scale).

RESULTS
White sorghum muffins were reported as the most liked after wheat flour and whole wheat muffins according to all sensory analysis. Buckwheat (4.1±0.7) and Lentil (2.7±0.6) muffins have the lowest overall acceptability score of all the muffin samples. Wheat (19.2 mm) had most baking volume and then lentils' baking volume was 15.8 mm, baking volumes of grain and legume muffins were similar ($p=1.000$). Energy and nutrient ingredients of legumes muffins were higher than grain muffins except carbohydrate ($p>0.05$). Chickpea (22.2mg), lentils (19 mg) and black gram (18.0 mg) had higher iron than grain flour muffins ($p=0.025$).

CONCLUSIONS
Legumes are a source of plant-base sustainable protein that can be easily used not only in food preparation but also in the production of sweet-tasting bakery products. Whole wheat flour and white sorghum flour were found to be the closest to wheat flour as a result of sensory analysis. In terms of nutritional value, whole wheat flour is a much better alternative to purified wheat flour, while white sorghum flour is a better choice for individuals with gluten sensitivity such as celiac disease. In this study, the muffins were made with a single type of flour, but the flours can be used in different ratios with each other or in mixtures with wheat flour to increase the nutritional density of the product.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_005

STABILITY OF HONEY FROM THE BRAZILIAN STINGLESS BEE SCAPTOTRIGONA BIPUNCTATA AFTER TWO YEARS OF STORAGE

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BACKGROUND AND OBJECTIVES

Stingless bee honey (SBH) differs from conventional honey (*Apis mellifera*) in having higher moisture and acidity and lower sugar content, as well as better antimicrobial, antioxidant and anti-inflammatory properties [1]. Among the honey-producing species, *Scaptotrigona bipunctata* (known as Tubuna bee) stands out, native to Brazil and of great ecological and economic importance. However, the effects of prolonged storage on the quality of SBH are still poorly known, limiting its commercial and scientific potential [2]. Therefore, the aim of this study was to evaluate the physicochemical and microbiological parameters of fresh and thermic treatment of *Scaptotrigona bipunctata* honey after two years of storage.

METHODS

Three samples of Tubuna bee honey were collected in April 2022 in the Metropolitan Region of Curitiba, Paraná, Brazil. Each sample was subdivided into two parts: one was stored fresh (Fr), and the other underwent thermal treatment (TT) at 65ºC/3 min before storage. The analyses of free acidity, pH, hydroxymethylfurfural (HMF), molds and yeasts were performed in triplicate at the time of collection (April 2022) and after two years of storage at room temperature (19ºC ± 6.2ºC) in sealed bottles (April 2024).

RESULTS

After two years, the free acidity (mEq/Kg) increased in both Fr honey (from 41.2 ± 6.4 to 88.5 ± 12.5) and TT honey (from 40.4 ± 8.1 to 57.3 ± 2.0). The pH value decreased in all samples (from 3.7 ± 0.3 to 3.5 ± 0.3). The HMF content (mg/Kg) increased from 1.8 ± 0.9 to 4.1 ± 0.9 in Fr honey and from 1.0 ± 0.3 to 3.1 ± 2.7 in TT honey. The molds and yeasts count (CFU/mL) decreased in Fr honey (from 5.3 x 10^2 to 5.0 x 10^2) and TT honey (from 2.8 x 10^2 to 1.5 x 10^2).

CONCLUSIONS

Despite the changes observed, the thermally treated honey (65ºC/3min) remained within the quality limits established by the legislation of the State of Paraná for stingless bee honey [3], including free acidity (< 60 mEq/Kg), pH (< 4.7), HMF (< 40 mg/Kg) and molds and yeasts (< 1 x 10^4 CFU/mL). The RESULTS provide a scientific basis for international regulations on the quality of thermally treated SBH, which do not yet exist. In addition, SBH is a sustainable product that can improve Brazilian biodiversity, promote environmental conservation practices and drive the expansion of the market by helping to generate income for small producers and rural communities.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_006

KETONE BODY INTAKE DURING PREGNANCY IMPROVES GLUCOSE AND LIPID METABOLISM IN OFFSPRING IN MICE

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BACKGROUND AND OBJECTIVES

It has been reported that fetal malnutrition increases the risk of developing metabolic syndrome after birth. In our previous study using mice, we found that dietary restriction during pregnancy exacerbated obesity and abnormal glucose and lipid metabolism in the offspring, whereas restriction of only carbohydrate during pregnancy improved obesity and glucose metabolism in the offspring. We also found that transplantation of the intestinal microbiota at weaning from either fetal nutritional restricted mice into germ-free mice improved glucose and lipid metabolism. In this study, we focused on ketone bodies, which are produced in the liver when glucose is not readily available, as a mechanism that can induce similar changes in the intestinal microbiota during pregnancy and improve glucose and lipid metabolism in the next generation. We investigated the effects of administration of β-hydroxybutyrate (BHB), a ketone body, during late pregnancy in mice on high-fat diet-induced abnormal glucose and lipid metabolism in the offspring.

METHODS

Pregnant female C57BL/6J mice were divided into three groups and administered with water (control group), 150 (low-dose group), or 300 (high-dose group) mg/mouse/day of BHB from day 10.5 of gestation to the day before delivery. The pups were fed a 60 kcal% high-fat diet from 5 weeks of age, and subjected to an oral glucose tolerance test at 19 weeks of age and dissection at 20 weeks of age.

RESULTS

The high-dose group showed a significant decrease in liver and white adipose tissue weights, liver triglyceride content, and fasting plasma glucose level compared to the control group. The high-dose group also showed a significant decrease in HOMA-IR and increase in QUICKI compared to the control group. In addition, the mean adipocyte area in perirenal adipose tissue was significantly lower in the high-dose group compared to the control group.

CONCLUSIONS

Administration of ketone body during late pregnancy improved glucose and lipid metabolism in the offspring. Improvement of insulin resistance and the enhancement of insulin sensitivity by suppressing adipocyte hypertrophy in the pups were suggested as one of the mechanisms of improved glucose metabolism in the offspring.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_007

EFFECTS OF A TWO-WEEK INTERVENTION WITH PROBIOTICS GUMMIES ON GASTROINTESTINAL DYSFUNCTION IN WHITE-COLLAR EMPLOYEES: A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
Abnormalities in Gastrointestinal (GI) function, typically manifested as dyspepsia, abdominal pain, bloating, constipation, and diarrhea, are prevalent concerns among sedentary white-collar employees. GI dysfunction is often induced by gut microbiota disorder and probiotic supplements are known to be an effective intervention. Gummies are more popular with consumers than capsules, but the processing method is unsuitable for common probiotics. *Bacillus coagulans* BC30 (BC30) exhibits remarkable resistance to high temperature, and can be produced in the form of gummies, while its health benefits remain unexplored. Therefore, our study aims to evaluate the effects of gummies containing BC30 on improving defecation habits and digestive function.

METHODS
Sixty white-collar employees, reporting self-perceived GI dysfunction, were recruited and randomly assigned equally to the low-dose (LG, 1 billion CFU/day) and high-dose (HG, 2 billion CFU/day) groups for the clinical trial. Participants were further categorized into constipation and diarrhea subgroups based on self-reported stool characteristics. Stool characteristics were assessed using the Bristol Stool Form Scale (BSFS), and the severity of constipation was evaluated through the Constipation Scoring System (CSS). The frequency and severity of GI symptoms—including bloating, abdominal pain, early satiety, belching, poor appetite, heavy stomach, indigestion, nausea or vomiting, poor GI motility, and dissatisfaction with digestive function—were rated using a 5-point Likert-type scale.

RESULTS
After two weeks of BC30 gummies consumption, the prevalence of constipation among the participants decreased from baseline levels (LG: 36.7% vs 20.0%, HG: 43.4% vs 6.7%). The mean CSS for LG decreased by 27.5% compared to baseline ($p > 0.05$), whereas that for HG reduced by 47.5% ($p < 0.01$). Analysis of stool consistency between subgroups revealed that the BSFS scores increased from 3 to 4 in the constipation subgroup, and decreased from 6 to 4 and 5 in the diarrhea subgroup. Additionally, the GI symptom scores of LG decreased by 43.1% after two weeks ($p < 0.01$), while a significant reduction was observed in HG after only one week ($p < 0.05$), with further decline noted after two weeks ($p < 0.001$).

CONCLUSIONS
Overall, supplementation with the BC30 gummies may help to regulate bowel movement, enhance stool consistency, and alleviate various digestive discomforts among sedentary people experiencing GI dysfunction.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_008

EFFECTS OF COMBINED INTAKE OF FOOD COMPONENTS ACTIVATING THERMORECEPTORS ON ENERGY METABOLISM

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BACKGROUND AND OBJECTIVES
Menthol and capsaicin are compounds known to activate cold receptors (TRPM8) and heat receptors (TRPV1), respectively, and their intake has been reported to enhance lipid metabolism. However, the mechanisms of action differ between these compounds, and the potential synergistic effects of their combined administration remain unclear. This study aimed to evaluate the effects of combined menthol and capsaicin intake on energy metabolism and lipid accumulation, as well as to elucidate the underlying mechanisms.

METHODS
Six-week-old male C57BL/6J mice were divided into four groups and fed specific diets for four weeks: a normal diet group (N group), a 0.25% menthol-supplemented diet group (M group), a 0.03% capsaicin-supplemented diet group (C group), and a combined 0.25% menthol and 0.03% capsaicin-supplemented diet group (MC group). Due to reduced feed intake observed in the MC group, the diet concentrations were adjusted to 0.125% menthol and 0.015% capsaicin after six days.

RESULTS
Final body weight did not differ significantly between the N and M groups, while the C group showed a decreasing trend, and the MC group exhibited a significantly lower value. Epididymal fat weight was significantly reduced in the M, C, and MC groups compared to the N group. Hepatic triglyceride content was significantly higher in the M group and significantly lower in the C group relative to the N group, with no significant differences observed in the MC group.

CONCLUSIONS
The findings of this study suggest that menthol intake may disrupt lipid transport from the liver, whereas capsaicin intake enhances lipid metabolism in both hepatic and peripheral tissues. Moreover, the combined intake of menthol and capsaicin demonstrates a greater capacity to suppress peripheral lipid accumulation, likely due to their distinct yet complementary mechanisms of action. These RESULTS underscore the potential of combining menthol and capsaicin as a dietary strategy to improve energy metabolism and mitigate lipid accumulation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_009

ANTIOXIDANT EFFECTS OF THE ACIDIC ETHANOL EXTRACT OF PURPLE CAULIFLOWER (BRASSICA OLERACEA L. VAR. BOTRYTIS)

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BACKGROUND AND OBJECTIVES
Purple cauliflower (Brassica oleracea L. var. botrytis) is a vegetable rich in anthocyanins. Previous our studies have identified six anthocyanins and L-ascorbic acid as antioxidant compounds in purple cauliflower based on a 2,2-diphenyl-1 picrylhydrazyl (DPPH) radical scavenging activity. However, the antioxidant effect of purple cauliflower in vivo remains to be elucidated. The objective of this study is to examine the antioxidant effect of purple cauliflower extract using iron induced acute oxidative injury in an animal model.

METHODS
To prepare the test samples, purple and white cauliflowers were freeze-dried and milled to produce powders, which were extracted with acidic ethanol. DPPH radical scavenging activity of the purple and white cauliflower extracts (P-Ex and W-Ex) was evaluated. Six-Week-old male ICR mice were randomly assigned to five ferric nitrilotriacetate (Fe-NTA)-treated groups (n=4-6), which included a phosphate buffered saline group (PC) and four extract groups: low dose P-Ex, high-dose P-Ex and W-Ex, and L-ascorbic acid. In addition, three Fe-NTA-untreated groups administered with P-Ex, W-Ex, and phosphate-buffered saline were designed to investigate the potential adverse effects of extracts. The mice were fasted for 12 h and the extract was administered orally 15 min before the intraperitoneal injection of Fe-NTA. Subsequently, the mice were dissected 60 min following the administration of Fe-NTA, and blood and kidney were obtained. Thiobarbituric acid reactive substances (TBARS) in plasma and renal homogenate were quantified as an indicator of lipid peroxidation.

RESULTS
The antioxidant activities of the purple and white cauliflower extracts were 129 ± 2 μmol Trolox equivalent (TE)/g and 59 ± 1 μmol TE/g, respectively. The Fe-NTA-treated P-Ex group exhibited a markedly elevated plasma TBARS value (80.7 ± 38.7 nmol MDA/ml) in comparison to the untreated group (7.6 ± 1.9 nmol MDA/ml). In contrast, the Fe-NTA-treated P-Ex high-dose group exhibited significantly reduced plasma TBARS levels (23.4 ± 24.1 nmol MDA/ml) compared to the PC group. This suggests that oral administration of the extracts prior to Fe-NTA injection markedly suppressed TBARS production. A similar result was observed in renal homogenates. Furthermore, administration of P-Ex-H did not demonstrate any adverse effects in Fe-NTA-untreated mice.

CONCLUSIONS
These RESULTS indicate that the purple cauliflower extracts have greater antioxidant effects than the white cauliflower extract, both *in vitro* and *in vivo*. Purple cauliflower could therefore be beneficial as a food for the prevention of oxidative stress-related disorders.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_010

FORMULATION OF CHILDREN'S NUTRIENT-DENSE RECIPES FROM ADANSONIA DIGITATA PULP AND OCIMUM GRATISSIMUM LEAVES IN NORTH BENIN

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BACKGROUND AND OBJECTIVES
Neglected and underutilized species (NUS) can play an important role in nutrition and food security. This study aimed to promote the consumption of two NUS, *Ocimum gratissimum* and *Adansonia digitata*, by improving recipes that are traditionally consumed by children aged 6-23 months in the Atacora department.

METHODS
Two (02) improved recipes were formulated: baobab pulp-enriched porridge (BPP) and *egusi* sauce with african basil leaves and red palm oil (ESBR). Formulation was initially carried out using *MINITAB 19* mixing software. For each recipe, two factors (two main ingredients of the recipe) were considered for the formulation. The optimized recipes were then tested through a hedonic test with a sample of 66 children in three (03) communes. The nutritional densities of accepted recipes were then determined.

RESULTS
RESULTS showed that most of the children liked both recipes formulated. The energy densities of both recipes (1.24 ± 0.03 kcal and 1.89 ± 0.05 kcal/g respectively for BPP and ESBR) met the recommended standards. As for nutritional densities, only iron recommended density was achieved for BPP (4.86 ± 0.12 mg/100 kcal) while for ESBR, in addition to iron density, zinc and vitamin A densities were also achieved. The BPP recipe covered good levels of daily nutritional requirements for one single feed for iron (46.42 %) and energy (13.49%) considering the amount consumed by children, whereas the ESBR recipe covered levels of 26.61% for energy, 399.32% for vitamin A, 94.11% for iron and 17.44% for zinc.

CONCLUSIONS
A better valorization of these species through cooking demonstration sessions addressed to mothers is necessary to ensure the consumption of recipes formulated by communities in general and children in particular.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_011

A NOVEL STRATEGY FOR ALLERGY PREVENTION AND TREATMENT: SYNERGISTIC MODULATION OF GUT MICROBIOME BY COMBINED FRUCTAN INTAKE

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BACKGROUND AND OBJECTIVES

The gut microbiome plays a key role in food allergies. This study investigated the combined effects of short-chain fructan (1-Kestose [Kes]) and long-chain fructan (Inulin [Inu]) on preventing or improving food allergies in an ovalbumin (OVA)-induced allergy mouse model, with a focus on gut microbiome composition.

METHODS

In the pre-sensitization trial (prevention study) and post-sensitization trial (treatment study), the groups were divided as follows: the control group (Ctrl group) was fed AIN-93G without OVA allergy induction, while the OVA allergy-induced groups received AIN-93G (OVA group), Kes 5% (Kes group), Inu 5% (Inu group), or Kes 2.5% + Inu 2.5% (Kes+Inu group).In the prevention study, diets were introduced 2 weeks prior to OVA sensitization and continued until autopsy, while in the treatment study, diets were administered for 4 weeks after allergy induction. Measurements included allergy symptoms, rectal temperature, serum OVA-specific IgE levels, gut microbiome composition, and cecal metabolite levels. Enzyme assays were also performed in the prevention study using *E. coli* expressing fructan-degrading GH32 enzymes.

RESULTS

In the prevention study, the Kes+Inu group significantly reduced allergy indicators. Gut microbiome analysis revealed increased abundances of *Parabacteroides distasonis* and *P. goldsteinii*, while metabolic analysis showed elevated levels of acetate and lactate in cecal contents. Enzyme assays further confirmed that GH32 enzymes from these bacteria actively degraded Kes and Inu in vitro.

In the treatment study, the Kes+Inu group demonstrated the greatest improvement in allergy symptoms. Gut microbiome analysis revealed an increased abundance of *UBA7173* within the *Muribaculaceae* family, and metabolic analysis showed elevated acetate levels in cecal contents.

CONCLUSIONS

The combined intake of Kes and Inu exhibited strong allergy-suppressive effects in both prevention and treatment trials. In the prevention study, the increased abundance of *P. distasonis* and *P. goldsteinii*, attributed to fructan degradation, was thought to contribute to allergy alleviation through elevated acetate and lactate production. In the treatment study, *UBA7173* and its presumed acetate production played key roles in improving allergy symptoms. These findings highlight the potential of Kes and Inu as functional food components for allergy prevention and treatment, with promising clinical applications.

CONFLICTS OF INTERESTS

Hideaki Takahashi, Tadashi Fujii, Takumi Tochio and Yoshiki Hirooka are members of BIOSIS Lab. Co., Ltd.Hideaki Takahashi, Tadashi Fujii, Yoshiki Hirooka and Takumi Tochio are members of BIOSIS Lab. Co., Ltd.Tadashi Fujii, Yoshiki Hirooka, and Takumi Tochio are affiliated with a joint research program between WELLNEO SUGAR Co., Ltd. and MINORI Inc.

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1. Combined oral intake of short and long fructans alters the gut microbiota in food allergy model mice and contributes to food allergy prevention

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EPO3_012

THE TRANSCRIPTIONAL CO-ACTIVATOR PGC1A IN SKELETAL MUSCLE MEDIATES THE ANTI-OBESITY EFFECTS OF SOY ISOFLAVONES

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BACKGROUND AND OBJECTIVES

Obesity, a factor increasing the risk of metabolic diseases such as type 2 diabetes, dyslipidemia, and hypertension, can be reduced by the intake of soy isoflavones. Peroxisome proliferator-activated receptor γ coactivator 1α (PGC1α) is a transcriptional coactivator whose expression increases in skeletal muscle during exercise and co-activates a variety of transcription factors. In this study, we investigated whether skeletal muscle PGC1α is involved in the anti-obesity effects of soy isoflavones using skeletal muscle-specific PGC1α knockout mice.

METHODS

- Skeletal muscle-specific PGC1α-deficient (PGC1α-KO) mice were used for voluntary exercise in a rotating cage. In addition, they were fed a high-fat diet containing soy isoflavones for 4 weeks.
- Gene expression analysis was performed by qRT-PCR in skeletal muscle, white adipose tissue and liver.
- Gene expression analysis was performed by qRT-PCR in C2C12 myoblasts overexpressing PGC1α and supplemented with soy isoflavones.

RESULTS

In PGC1α-f/f mice, a decrease in white adipose tissue weight was observed after a combination of exercise and soy isoflavone intake. In contrast, no significant changes were observed in PGC1α-MKO mice. Gene expression analysis of skeletal muscle revealed that gene expression of energy metabolism-related genes such as mitochondrial function, lipolysis, and fatty acid oxidation, which are increased by soy isoflavone intake, were not observed in PGC1α-MKO mice. In white adipose tissue, beige adipose tissue markers including *Ucp1* gene expression appeared to be increased by the combination of soy isoflavones and exercise in both PGC1α-flox/flox and PGC1α-MKO mice, but not significantly. In addition, gene expression related to lipolysis was similar. In C2C12 myoblasts overexpressing PGC1α, soy isoflavone treatment increased genes related to energy metabolism.

CONCLUSIONS

PGC1α in skeletal muscle may be involved in some of the anti-obesity effects of soy isoflavones.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_013

SLOW-DIGESTIBLE GLUCANS ENHANCE GLP-2 SECRETION AND PROMOTE ILEAL VILLI ELONGATION IN RATS

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BACKGROUND AND OBJECTIVES
Due to limited nutrient supply, the ileal villi are shorter than those in the jejunum, resulting in reduced barrier function. Villi elongation, mediated by glucagon-like peptide-2 (GLP-2), is crucial for maintaining intestinal integrity. GLP-2 is secreted by nutrient-stimulated L cells, which are predominantly located in the distal small intestine. Slow-digestible nutrients have the potential to increase nutrient delivery to the ileum, thereby stimulating GLP-2 secretion. This study aimed to investigate whether glucose delivery to the ileum via slow-digestible glucans (SDGs) could enhance GLP-2 secretion and promote ileal villi elongation.

METHODS
Expt. 1: Rats were fed either a control diet (C) or a 10% SDGs diet for 10 days. Isomaltodextrin (IMD) and resistant maltodextrin (RMD) were used as SDGs sources. **Expt. 2**: To induce atrophy of small intestinal villi, rats were administered 5-fluorouracil (5-FU, 20 mg/kg). The rats were simultaneously fed the same diets as in Expt. 1 for 10 days. **Expt. 3**: Following villus atrophy induced by 5-FU, rats were subsequently fed the same diets as in Expt. 1 for either 3 or 6 days.

RESULTS
Expt. 1: Rats fed the RMD diet exhibited significantly higher portal GLP-2 levels and longer ileal villi compared to the control group. These findings suggest that RMD facilitates glucose delivery to the ileum, thereby enhancing GLP-2 secretion and promoting villi elongation. In contrast, IMD, presumed to be more rapidly digestible compared to RMD, resulted in weaker GLP-2 secretion and villi elongation. **Expt. 2**: Under conditions of inhibited cell proliferation induced by 5-FU, no significant changes in GLP-2 secretion or villi length were observed in rats fed SDGs. **Expt. 3**: After 5-FU-induced atrophy of ileal villi, rats fed SDGs showed significantly enhanced GLP-2 secretion and significant recovery of villi length after both 3 and 6 days of feeding.

CONCLUSIONS
This study demonstrates that SDGs, such as RMD, enhance glucose delivery to the ileum, stimulate GLP-2 secretion, and promote ileal villi elongation. These findings highlight the potential of SDGs as dietary interventions for improving intestinal health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_014

CHARACTERIZATION OF SUMASHI-JIRU (JAPANESE CLEAR SOUPS) WITH VARIOUS INGREDIENTS USING COOKING METABOLOMICS

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BACKGROUND AND OBJECTIVES

Low-sodium foods (LSF) are widely recognized for their ability to reduce the risk of lifestyle-related diseases. However, some LSF are often perceived as lacking “salty”, which can leave a negative impression. To address this challenge, it is essential to scientifically evaluate and enhance “taste” particularly in prerared dishes. Cooking metabolomics, a novel approach to profiling food components, offers significant potential for optimizing “taste” of cooked foods. In this study, we applied cooking metabolomics to perform a metabolic profiling of *sumashi-jiru*, a traditional Japanese clear soup, with various ingredients. We also assessed whether metabolic profiles can effectively capture and characterize the unique features of each soup.

METHODS

Sumashi-jiru was prepared by seasoning dashi (bonito stock) with soy sauce and adjusting the salt concentration to 0.7%. Vegetable soup was made by thoroughly cooking vegetables in the prepared *sumashi-jiru*. Fried-tofu soup was created by adding fried-tofu to the vegetable soup, and chicken soup was prepared by thoroughly cooking chicken in the vegetable soup. Metabolic profiles of each soup (n=5) were analyzed using a novel metabolomics platform, PiTMaP (Anal. Chem., 2020). Multivariate analyses, including PLS-DA, were performed using R software.

RESULTS

Aproximately 60 metabolites were detected in each soup. In the PLS-DA score plots, the chicken soup group was distinctly separated from the others along the first principal component axis, while the *sumashi-jiru* group was separated along the second principal component axis. In contrast, the vegetable soup and the fried-tofu soup groups showed no clear separation. Key metabolites contributing to group separation included 10 amino acids, 4 sugar phosphates, 3 organic acids, 2 fatty acids, 2 nitrogen-containing compounds, 2 nucleotide derivatives, and 1 sugar. These findings suggest that components eluted from chicken had a strong impact on the metabolic profiles of the *sumashi-jiru*-based soups, whereas the contributions of heated vegetables and fried-tofu were comparatively limited.

CONCLUSIONS

Cooking metabolomics successfully identified the metabolic profiles of *sumashi-jiru*-based soups. These findings highlight the potential of cooking metabolomics as an analytical approach for evaluating the taste of prepared dishes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_015

FORMULATION AND CHARACTERIZATION OF FUNCTIONAL BISCUITS OBTAINED BY INCORPORATING PAPAYA (CARICA PAPAYA), PINEAPPLE (ANANAS COMOSUS) AND BEETROOT (BETA VULGARIS) POWDER

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BACKGROUND AND OBJECTIVES

Beetroot (*Beta vulgaris*), pineapple (*Ananas comosus*) and papaya (*Carica papaya L*) are important natural fruits and legumes in producing functional foods due to the presence of bioactive (vitamin C, β-carotène) and antioxidant compounds. This study was undertaken to formulate and evaluate the physicochemical composition and antioxidant properties of biscuits incorporated with papaya, pineapple and beetroot powder at the rates of 10%, 15%, 20% and 25% (w/w).

METHODS

The hardness, pH, water absorption, proximate composition, mineral analysis and in vitro antioxidant profile (DPPH, FRAP) were analyzed using standard methods. Sensory analysis was conducted by applying a hedonic scale test using the technique of a 9-point.

RESULTS

The RESULTS showed that the hardness varied from 92.02 ± 4.29 N for biscuits with 25% of fruit powder to 104.66 ± 2.98 N for biscuits with 10% of fruit powder. The pH values decreased for all the enriched samples compared to the control (5.90-7.4), but this was more relevant for the samples enriched with 20 and 25% fruit powder. The use of beetroot, pineapple and papaya flour resulted in a slight increase in water absorption (33.32-160.53%). Moisture, fat, protein, fibre, ash, and available carbohydrate content ranged from 4.79-9.92%, 17.02-21.65g/100g, 7.94-9.89g/100g, 2.46-14.86g/100g, 2.39-3.55g/100g, 42.14-56.85g/100g respectively. Soluble sugars varied from 3.16-13.82g/100g. The micro minerals (Fe, Zn and Mg) ranged from 4.28-8.39%, 4.82-5.74% and 20.41-62.31% respectively. The total polyphenols flavonoids, and antioxidant activity increased with fruit powder content incorporated. Antioxidant properties such as total carotenoids and total phenolic contents were improved with the addition of fruit powder to the biscuits. Among the treatments, the biscuits prepared with 10% of papaya, pineapple and beetroot powder had the highest nutritional and sensory quality, having an overall acceptability score of 6.71 on a 9-point hedonic scale.

CONCLUSIONS

This study highlights the potential of utilizing papaya, pineapple and beetroot in functional biscuits, hence it can serve as relief for malnutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_016

EFFECTS OF GUAR GUM ON FATTY LIVER AND BRAIN INFLAMMATION IN MICE FED A HIGH-FAT DIET

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BACKGROUND AND OBJECTIVES
Neuroinflammation is an activation of the immune response in the brain and spinal cord caused by neurotoxins. Neuroinflammation activates the immune cells, microglia, which secrete inflammatory cytokines. In chronic neuroinflammation, abnormal production of inflammatory cytokines causes neurotoxicity and contributes to the progression of neurodegenerative diseases. Guar gum is a soluble dietary fiber obtained from the endosperm of guar beans. Epidemiological studies have reported that dietary fiber intake affects brain function through changes in the intestinal microbiota. In this study, we examined the effects of guar gum on fatty liver and brain inflammation in mice fed a high-fat diet.

METHODS
C57BL/6J mice were obtained and bred. The mice were divided into three groups: S (Standard : S) group, H (High Fat Diet : H) group, and Guar Gum (High Fat Diet + Guar Gum : HG) group. The animals were divided into three groups. The final body weight was measured on the day before dissection, and tissue weight, liver triglycerides, and gene expression levels in several tissues were measured after dissection.

RESULTS
Body weight and liver triglyceride levels were significantly lower in the HG group than in the H group. White fat weight showed a tendency that guar gum administration suppressed the increase caused by the high-fat diet. Cecum weight was significantly increased in the HG group compared to the H group. In the hippocampus, the expression levels of inflammatory cytokines TNF-α, IL-6, and indoleamine-2,3-dioxygenase (IDO), a key enzyme in tryptophan metabolism, were lower in the HG group than in the H group. In addition, the expression level of PPAR-α, which promotes β-oxidation in the liver, was significantly increased in the HG group compared to the H group. The lipid content of feces was also significantly increased in the guar gum treatment.

CONCLUSIONS
Guar gum suppressed obesity and fatty liver caused by high-fat diet intake. IDO is known to be activated by inflammation and to affect the production of quinolinic acid (QUIN), which has neurotoxic effects. Inflammatory cytokines and IDO were decreased by guar gum treatment, suggesting that guar gum suppresses brain inflammation induced by obesity. As a possible mechanism of action, suppression of fatty liver and changes in the intestinal environment improvement may suppress the expression of inflammation-related factors in the brain.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_017

IMPROVING KOUGLOF, A SWEET BREAD, USING GRAPE SEED OIL AND LACTIC ACID BACTERIA: A QUALITY EVALUATION FOR USE AS FOOD IN NURSING CARE

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BACKGROUND AND OBJECTIVES

Kouglof, a traditional fermented confectionery resembling brioches and containing raisins, originates from the Alsace region of France. Although kouglof includes a high amount of butter, the process of making it is similar to that of making ordinary bread. Its rich nutrient content makes it a suitable staple food for older people who eat less. However, high consumption of saturated fats in butter increases the risk of cardiovascular diseases. In addition, its slightly stiff texture may make swallowing difficult in older people with decreased salivation. To address these issues, we investigated the improved preparation of kouglof using high-quality grape seed oil (GO) as a butter substitute and lactic acid bacteria (LAB) to soften the texture and evaluated its quality.

METHODS

We investigated the quality of kouglof using GO and some LAB. Furthermore, we carried out the color analysis, the 3/2D image analysis, and the physical properties tests of kouglofs.

RESULTS

Quality analysis of kouglof prepared using GO instead of butter showed that the height and specific loaf volume of kouglof made with GO (GO kouglof) were higher than those of ordinary kouglof made with butter. Textural analysis RESULTS showed that the hardness of the GO kouglof was lower than that of ordinary kouglof. The 3/2D image analysis showed that the bubble volume ratio was higher than the ordinary ratio, and the bubble-structure model index value was nearly oval. The linoleic acid content of the GO kouglof did not decrease after baking. Subsequently, we added different amounts of LAB to check if it affected dough softness when kneading the GO kouglof. The moisture content in the kouglof increased with the addition of LAB, with the highest moisture content observed in kouglof containing 32% LAB. In physical properties tests, the softness was in the following order: 16% LAB, 32% LAB, and no LAB.

CONCLUSIONS

The GO kouglof is softer and more elastic than ordinary kouglof, and the addition of LAB further improves its softness. We successfully optimized the amount of LAB required to soften the dough, providing a solid foundation for developing nursing-care food for older adults with difficulty in chewing and swallowing.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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3. Quality evaluation of the fermented confectionery kouglof prepared with different oils and fats
4. An innovative brioche enriched in protein and energy improves the nutritional status of malnourished nursing home residents compared to oral nutritional supplement and usual breakfast: FARINE+project
5. Lactic acid bacteria synergistic fermentation affects the flavor and texture of bread
6. Grape Seed Oil Compounds: Biological and Chemical Action for Health
7. Sweet Bread Produced by the Lactic Acid Bacteria L.brevis and the yeast S.cerevisiae
8. Selection criteria of lactic acid bacteria to be used as starter for sweet and salty leavened baked products

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EPO3_018

IMPROVING DIET QUALITY OF 6-23 MONTH-OLD SENEGALESE CHILDREN THROUGH THE DEVELOPMENT OF INNOVATIVE COMPLEMENTARY FOODS BASED EXCLUSIVELY ON LOCAL HIGH NUTRITIONAL VALUE PRODUCTS

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BACKGROUND AND OBJECTIVES
Most of the complementary foods available in Senegal, particularly in rural areas, are essentially cereal-based and are therefore undiversified. They are poor in the essential nutrients required to prevent malnutrition in 6–23-month-old children. The aim of this work was to propose formulations of blended flour made from local nutritionally key foods well adapted to the local population's tastes and eating habits.

METHODS
Raw materials selected included millet biofortified with iron and zinc, orange-fleshed sweet potato rich in provitamin A carotenoids, cowpea flour or powdered dried fish muscle as a source of proteins, and groundnut flour or paste for their essential fatty acid. Flours were characterized according to their macro (proteins, lipids, ashes and total carbohydrates) and micronutrient (iron, zinc, Ca, Mg, etc.) contents to select the optimum combinations, through laboratory analyses or using data from food composition tables. Formulations were calculated in line with the Senegalese standards for infant flours based on 2 meals served per day to meet energy requirements, as well as iron and zinc levels of more than 5 mg/100 kcal and 2 mg/100 kcal respectively.

RESULTS
Iron and zinc contents in biofortified millet flour was 7.38 ± 0.35 mg/100 g DM and 6.12 ± 0.22 mg/100 g DM respectively. Thiamine levels were 5 times higher in groundnut flour (5.75 ± 0.14 µg/ g DM) than in groundnut paste (0.19 ± 0.01 µg/ g DM). Fishmeal-based formulas provided an average of 408.8 kcal/100 g DM, whereas cowpea-based formulas provided 394.14 kcal/100 g DM. Distribution of energy percent by macronutrients was in line with WHO recommendations for healthy diet. All formulations contained between 3.35 and 3.51 g of digestible protein per 100 kcal. They provided all the essential amino acids at adequate levels (more than 100% of estimated values). However, iron and zinc levels were around 30% and above 60% of the targeted values respectively.

CONCLUSIONS
The proposed formulations will considerably increase macro and micronutrients intake.Their consumption could contribute to a significant increase in infant’s diet diversity, through the introduction of four new food groups in addition to the cereals, and the breastmilk. Sensory and acceptability tests on porridges based on these formulations are ongoing.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_019

EVALUATION OF THE DPP-IV INHIBITORY AND ANTIOXIDANT ACTIVITY OF MILKFISH FRAME (CHANOS CHANOS) HYDROLYSATES

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BACKGROUND AND OBJECTIVES
Diabetes has become one of the most critical public health issues in the world in the 21st century. Fish by-products particularly from milkfish are known to produce bioactive peptides which helps regulate blood sugar and possesses antioxidant capacities. Hence, the study utilized milkfish frame which is a by-product of the milkfish industry to assess its dipeptidyl peptidase IV [DPP-IV] inhibitory and antioxidant activity.

METHODS
The study employed milkfish frames hydrolyzed by pepsin, papain, and bromelain at different enzyme-substrate ratios for 8 hours to produce peptides with high DPP-IV inhibitory activity. Antixodant assay using DPPH free radical scavenging activity, ABTS antioxidant capacity and ferric reducing antioxidant power [FRAP] was also employed.

RESULTS
RESULTS revealed that two percent (2%) pepsin has the highest peptide content (283.64 mg/g) and has the highest DPP-IV inhibitory rate (68.47%) to produce the milkfish frame hydrolysates. RESULTS also showed that the DPPH free radical scavenging activity, ABTS antioxidant capacity and FRAP has improved after enzymatic hydrolysis, with papain hydrolysate exhibiting the highest activity with values of 23.04%, 33.90% and 43.72 μg/mL, respectively. Furthermore, RESULTS of the study showed that DPPH free radical scavenging activity, ABTS antioxidant capacity and FRAP improved during further ultrafiltration and in vitro simulated gastrointestinal digestion.

CONCLUSIONS
From these RESULTS, it shows the potential of the milkfish frame to be used as a multifunctional food ingredient given it DPP-IV inhibitory and antioxidant ability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_020

PREVALENCE OF ANEMIA AMONG THE ELDERLY AGED 60 AND ABOVE IN CHINA IN 2015

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BACKGROUND AND OBJECTIVES
Elderly age is associated with a higher incidence of anemia. As China faces a demographic shift towards an aging population, which indicates that anemia among the elderly is a common health concern for us. The aim of this study was to analysis the prevalence of anemia and provide a scientific basis for reducing anemia rate in the elderly.

METHODS
The data were obtained from the 2015 China Adults Chronic Diseases and Nutrition Surveillance (2015 CACDNS), a multi-stage stratified cluster random sampling method was adopted. In order to improve the representativeness of the sample, the data were adjusted using post-stratification weighting.

RESULTS
A total of 48,955 elderly individuals were included in the study, with the prevalence of anemia was 9.2% in males and 9.1% in females. And the prevalence of anemia increased with age, with the rate in the 85 and older age group being twice that of the 60-64 age group. Females had a high prevalence of anemia due to pregnancy or menstrual bleeding, which had received widespread attention. However, our study found that the prevalence of anemia in the males aged 60 and above was higher than that in females.

CONCLUSIONS
The increased anemia risk in males can be partly attributed to dietary habits, lifestyle factors, sociodemographic conditions, hormonal changes, and a higher susceptibility to chronic diseases such as chronic kidney disease. Therefore, while paying attention to anemia in females, the issue of anemia in elderly males was also a cause for concern, especially the very elderly.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_021

EFFECT OF FOOD ADDITIVES ON THE INVERTEBRATE ALLERGENS

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BACKGROUND AND OBJECTIVES

Crustaceans, mollusks, and edible insects are categorized as invertebrates. In the European Union and many other countries, crustaceans and mollusks are recognized as statutory food allergens. Recently, edible insects have been introduced to the global market as novel and sustainable food. However, the studies indicate that edible insects may trigger allergic reactions in individuals with crustacean allergy. Food additives, including pH-adjusting agents and enzymes, may affect the activity and stability of proteins. Therefore, the objective of this study is to investigate the effects of food additives on the common allergenic proteins among invertebrates.

METHODS

The selected crustaceans (shrimp), mollusks (squid), and edible insects (cricket) were processed with various alkaline or acidic pH-adjusting agents and enzymes. The proteins of processed samples were extracted. Gel electrophoresis and western blot were used to analyze the immunoreactivity of allergenic proteins.

RESULTS

The immunoreactivity of tropomyosin, a major allergenic protein in invertebrates, was either unaffected or showed a slight increase in alkali-treated samples. In contrast, enzymatic and acidic treatments demonstrated varying degrees of reduction in the immunoreactivity of tropomyosin, with the degree of reduction varying by species.

CONCLUSIONS

Common food additives may either increase or decrease the immunoreactivity of invertebrate allergenic proteins, with the extent of reduction being species-dependent. This study provides further insight into the effects of food additives on food allergens.

CONFLICTS OF INTERESTS

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EPO3_022

IN VITRO PROTEIN DIGESTIBILITY OF RUBISCO-ENRICHED WHEAT DOUGHS

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BACKGROUND AND OBJECTIVES
As the demand for sustainable, plant-based protein sources continues to grow, there is increasing interest in identifying new ingredients for food enrichment. This research explores the nutritional and digestive impacts of adding RuBisCO to wheat dough, comparing to pea protein or gluten addition.

METHODS
Wheat doughs were fortified with 10% external proteins and thermally treated to mimic bread food. Amino acid composition, COST standardized static in vitro digestion, degree of hydrolysis, and nitrogen/protein solubility, were conducted to assess the quality and digestibility of these enriched doughs.

RESULTS
RuBisCO and pea proteins enhanced the chemical score and the in vitro PDCAAS (IV-PDCAAS) score of the wheat dough compared to the gluten control. Digestibility assessments indicated that RuBisCO modified the kinetics of protein hydrolysis: nitrogen release was lower during gastric digestion but higher during intestinal digestion than in other samples. Size-exclusion chromatography of the digesta's soluble and insoluble parts showed that the protein network in RuBisCO-enriched dough was more resistant to gastric hydrolysis than in other doughs. These findings are analyzed considering the sites of enzymatic cleavage, the presence of enzyme inhibitors, the state of protein aggregation, and the secondary structures within the protein network of each dough type.

CONCLUSIONS
RuBisCO appears as a promising protein to enhance the protein nutritional quality ofwheat-based products. Its aggregation properties, beneficial for viscoelastic dough properties,modifies its protein digestion kinetic and the peptide profile after digestion remains to be cahracterized.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_023

STRAWBERRY LEAVES AND THE POLYPHENOLIC COMPONENTS PREVENT AND IMPROVE ATOPIC DERMATITIS INDUCED IN HR-1 MICE

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BACKGROUND AND OBJECTIVES
Strawberry fruit has been reported to have physiological functions such as antioxidant, anti-inflammatory and anti-allergic effects. However, there are no reports on functional actions specific to strawberry leaves. In this study, the effects of strawberry leaf extract and its polyphenolic components on atopy were investigated.

METHODS
Strawberry leaf extract (SLE) and its polyphenol components (SLP) used in the experiment were extracted and prepared using 50% (v/v) ethanol. Four-week-old female HR-1 mice were pre-fed for one week and then fed each test diet for seven weeks. The atopy-induced group was fed an atopy-induced diet (HR-AD), the SLE group was fed HR-AD with 1% and 5% SLE, and the SLP group was fed HR-AD with 0.2% and 1% SLP. The atopy-uninduced group was fed a standard diet (Lab M R stock diet). Body weight, keratin water content and transdermal water transpiration of the mice were measured every week from the start of feeding. Seven weeks after the start of the study, blood samples were taken under isoflurane aspiration anaesthesia and serum IgE, IgA, IgG, IgM and histamine levels were measured by enzyme-antibody methods. Antibody and cytokine mRNA expression levels in the spleen were also analyzed by RT-qPCR.

RESULTS
Compared to the HR-AD mice, the skin keratin water content increased in HR-1 mice treated with SLE. In addition, the allergic markers serum IgE and histamine levels were significantly reduced in the SLE and SLP-treated groups. On the other hand, no changes were observed in serum IgA, IgG and IgM concentrations. RT-qPCR analysis of splenocytes showed a significant decrease in IgE mRNA expression in the SLE- and SLP-treated groups compared to the atopy-induced control group. On the other hand, there were no differences in IgA, IgG and IgM mRNA expression levels in the groups. Compared to the atopy-induced control group, the SLE- and SLP-treated groups resulted in a significant reduction in IL-4 mRNA expression, which is involved in the enhanced production of Ig E.

CONCLUSIONS
The present study suggests that strawberry leaf extract and its polyphenol components have preventive and ameliorative effects on atopic symptoms and type I allergic reactions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_024

EVALUATION OF THE EFFECT OF NACRE EXTRACT ON DIABETIC ENCEPHALOPATHY USING KK-AY MICE

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BACKGROUND AND OBJECTIVES
Pearls are widely used as natural remedies in traditional medicine and in cosmetics and functional food. Previously, nacre extract derived from pearl shells significantly improved the memory in cognitive impairment model mice. In this study, we aimed to assess the effects of orally administered nacre extract on cognitive dysfunction, specifically diabetic encephalopathy, in genetically diabetic KK-Ay mice.

METHODS
ICR and KK-Ay were fed a AIN93G basal diet without or with 125,250 mg/kg nacre extract for 3 months. Blood glucose level and insulin resistance were evaluated by OGTT and ITT. Diabetic encephalopathy was evaluated by behavior tests. Real-time PCR was used to evaluate the mRNA expression levels ofsirtuin-1(Sirt1),glucose transporter-4(GLUT4), and brain-derived neurotrophic factor(BDNF) in mouse brains.

RESULTS
Various behavioral tests, including the Y-maze, novel object recognition, open field, and elevated plus maze tests, revealed that the nacre extract effectively alleviated the memory deficits and anxiety-like behaviors in diabetic mice. Moreover, the extract improved glucose tolerance by enhancing insulin sensitivity. It also exhibited cognitive and metabolic benefits by upregulating the Sirt1,GLUT4, and BDNF expression levels in the brain.

CONCLUSIONS
This study suggests that the nacre extract ameliorates diabetic encephalopathy by enhancing glucose metabolism and protecting neuronal cells in the brain.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_025

EFFECT OF PROTEASE TYPE ON THE ANTIOXIDANT AND ENZYME INHIBITORY PROPERTIES OF CHICKPEA PROTEIN HYDROLYSATES

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BACKGROUND AND OBJECTIVES
Protein-derived peptides have gained attention for their potential health benefits such as antioxidant (AO) & enzyme inhibition (EI) properties. The objective of this study was to compare AO & EI activity of protein hydrolysates obtained from enzymatic hydrolysis of chickpea protein concentrate.

METHODS
The chickpea protein concentrate was isolated using alkaline solubilization coupled with isoelectric pH precipitation. The protein concentrate was digested using each of the following enzymes: alcalase, flavourzyme, pepsin + pancreatin, trypsin, and chymotrypsin. Obtained hydrolysates were then characterised for AO and EI properties.

RESULTS
Comparatively the hydrolysates obtained from chymotrypsin showed significantly ($p<0.05$) highest protein content (65.46 ± 0.56%). The reducing power of DPPH scavenging, hydroxyl inhibition, ferric-reducing & metal-chelating activities exhibited significant ($p<0.05$) variations across different proteases. Flavourzyme hydrolysates demonstrated the highest ($p<0.05$) reducing power of 59.4 ± 2.03% for DPPH scavenging. Highest hydroxyl radical scavenging activity ($p<0.05$) was also observed in flavourzyme hydrolysates, with an inhibition rate of 40.71 ± 0.00%. Alcalase hydrolysates recorded significantly ($p<0.05$) higher ferric-reducing activity rate of 0.13 ± 0.0%. And, trypsin hydrolysates exhibited the highest metal-chelation activity ($p<0.05$) at 18.77 ± 0.75%. Enzyme inhibition activities of hydrolysates were found to be dose-dependent, with varying levels of inhibition observed at different concentrations. Hydrolysates from trypsin & flavourzyme exhibited significantly ($p<0.05$) higher enzyme inhibition against chymotrypsin, with inhibition rates of 60.92 ± 1.6% and 58.75 ± 4.2%, respectively. In comparison, flavourzyme & pepsin + pancreatin hydrolysates demonstrated the highest ($p<0.05$) inhibition of trypsin, with inhibition rates of 60.79 ± 1.04% & 58.93 ± 1.4%, respectively. All protease-derived hydrolysates showed strong 92% inhibition of α-amylase activity while up to 99% activity of α-glucosidase was inhibited. Pepsin + pancreatin & chymotrypsin hydrolysates recorded significantly ($p<0.05$) highest inhibition rates of 69.26 ± 0.7% & 68.81 ± 1.47% against pancreatic lipase.

CONCLUSIONS
Based on these RESULTS, we conclude that flavourzyme hydrolysis most effectively enhanced AO & EI properties of chickpea protein hydrolysates compared to other proteases. However, some of these hydrolysates hold the potential for use as ingredients to formulate functional foods & nutraceuticals suitable for managing diseases related to oxidative stress & diabetes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_028

LIFESTYLE, DENTAL PLAQUE MICROBIOTA, AND PERIODONTITIS: A COMMUNITY-BASED STUDY

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BACKGROUND AND OBJECTIVES

Periodontitis is a serious oral disease, which is the main cause of tooth loss. Understanding the influence of lifestyle on periodontitis and the role of dental plaque microbiota in them is a key to prevent and control periodontitis.

METHODS

This study included 2,184 Chinese adults from Lanxi Cohort. Lifestyle score specifically included waist circumference, drinking status, smoking status, diet and physical activity, which later divided participants into healthy and unhealthy lifestyle groups. Periodontitis was defined according to the diagnostic criteria of the American Academy of Periodontology (AAP). 16S rRNA sequencing was performed on dental plaque samples from 1,747 participants. Multivariable linear regression and logistic regression models were used in all analyses.

RESULTS

The prevalence of periodontitis decreased with the increase of healthy lifestyle score. Compared toparticipants with unhealthy lifestyle, those with healthy lifestyle had a lower prevalence of periodontitis (OR = 0.76, 95%CI = 0.62-0.94, p = 0.013), and this phenomenon was more pronounced in men. Dental plaque microbial analyses showed that participants with healthy lifestyle exhibited enriched α-diversity and altered β-diversity. Nineteen genera were found to be linked to lifestyle and nine of them significantly increased the risk of periodontitis. Dental plaque microbiota played a mediating role of 18.61% in the influence of lifestyle on periodontitis (p < 0.001).

CONCLUSIONS

Healthy lifestyle is associated with a lower prevalence of periodontitis, and dental plaque microbiota may play a mediating role in them. Furthermore, this study may provide a viable combination of healthy lifestyle for preventing periodontitis.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_029

INFLUENCES ON SWALLOWING BY BOLUS VOLUME, BOLUS VISCOSITY, SEX, AND AGE: ANALYSES BY A NOVEL METHOD FOR SWALLOWING FUNCTION MEASUREMENT BY SWALLOWING SOUNDS

Yuka Konoike[1, 2]; Kei Naramura[3]; Takahiro Hasegawa[3]; Izumi Tsukayama[1]; Saya Maruoka[1]; Takayo Kawakami[1]; Kayoko Ishii[2]; Tomoya Yoshida[3]; Masaki Hokari[3]; Toshiko Suzuki-Yamamoto[1]
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BACKGROUND AND OBJECTIVES
Acoustic analysis of pharyngeal sounds during swallowing may capture physiological functions, providing a noninvasive method for measuring swallowing capability. This approach could be valuable for early screening of swallowing declines and dysphagia, contributing to aspiration prevention. Quantifying the acoustic characteristics of swallowing through parameter analysis is essential for developing an objective measurement tool. Herein, we aimed to construct a noninvasive method for evaluating swallowing function using pharyngeal sounds during swallowing as indicators of performance.

METHODS
Healthy adults participated in the study, with no reported issues specific to chewing or swallowing functions. They were categorized into the younger group (aged 20–25 years) and older group (aged 50–65 years). We analyzed changes in swallowing function across variations in bolus volume, bolus viscosity, sex, and age using parameters such as swallowing duration, average voltage, and swallowing power derived from swallowing sounds.

RESULTS
Average voltage and swallowing power were significantly higher in men, both in younger and older groups, regardless of bolus volume and viscosity. These parameters generally decreased as bolus viscosity increased, with significant differences observed between men and women, except in older men. An age-related difference in swallowing function between men and women was noted in swallowing duration: older men took significantly longer to swallow a high-viscosity bolus compared to younger men, a pattern not observed in women. This finding suggests that men experience greater deterioration in swallowing with age than women.

CONCLUSIONS
This convenient and noninvasive method for swallowing function appears effective as an objective evaluation tool, indicating that swallowing varies by sex, aging, food physical property.

CONFLICTS OF INTERESTS
Mitsui Sumitomo Insurance Welfare FoundationSuzuken Memorial Foundation

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EPO3_030

TRENDS IN BMI AND OVERWEIGHT/OBESITY AMONG CHINESE ADULTS FROM 1982 TO 2015 AND PREDICTIONS FOR OVERWEIGHT AND OBESITY

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BACKGROUND AND OBJECTIVES
Over the past few decades, the prevalence of overweight and obesity among Chinese adults has increased dramatically. Data indicates that the overweight rate has surpassed 50%**.** This study analyzes the trends in Body Mass Index (BMI), overweight rates, and obesity rates among Chinese adults from 1982 to 2015. And based on linear regression models, presents estimates of the overweight and obesity rates among adults in China for 2025 and 2030.

METHODS
Data on height and weight of adults from five China Nutrition Surveys/Monitoring conducted between 1982 and 2015 were analyzed to assess the current status and trends of BMI among Chinese adults. Obesity and overweight were defined according to the criteria of China. Linear regression model was used to predict the overweight rate and obesity rate among adults in China for the years 2025 and 2030.

RESULTS
In 1982, the average BMI for adult males and females in China was 21.06 and 21.32, respectively. By 2015, the average BMI for adult males and females had risen to 24.25 and 23.89, respectively. The increase in BMI was greater for males than for females, particularly among young and middle-aged males. For females, the increase in BMI was more pronounced with age, especially in women over 60. Before 2000, adult men had a lower BMI than women, but this trend began to change after 2000, and by 2015, the average BMI of men aged 18-45 was higher than that of women. The overweight rate and obesity rate among adults in China increased from 11.0% and 1.9% in 1982 to 33.3% and 14.1% in 2015. Using a linear regression model to make predictions for 2025 and 2030, it is estimated that by 2025, the overweight rate and obesity rate among adults in China will be 39.1% and 16.8%, respectively, and by 2030, these rates will rise to 42.4% and 18.6%.

CONCLUSIONS
The BMI of males and females in China has been steadily increasing, with a greater rise observed in males than in females. Chinese adults are indeed facing a serious problem with overweight and obesity, with projections indicating that by 2025, over 55% of adults will be overweight or obese, and by 2030, this figure is expected to exceed 60%.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_031

FORMULATION AND CHARACTERIZATION OF A COMPOSITE INFANT FLOUR WITH LOCAL INGREDIENTS OF SOUTH KIVU: IRON AND ZINC ENRICHMENT STRATEGY

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BACKGROUND AND OBJECTIVES
Micronutrient deficiencies are a global nutritional problem. They are particularly prevalent among children living in areas where the diet is monotonous and based on cereals. Stunting and wasting affect 48% and 3% of children under five in South Kivu, in the eastern Democratic Republic of Congo. The infant formulas produced in the region do not always meet the standards recommended by the World Health Organisation (WHO). Our preliminary data show that children's first complementary food is porridge made from simple cereal flours (maize, soya, sorghum) or cereal flour/water mixtures. This study aimed to formulate iron and zinc enriched infant flours in line with international standards.

METHODS
The matrix formulation method was used to generate proportions of ingredients (maize, soybean, sorghum, fish powder) to be blended to achieve the required nutrient content. Three formulas, including a control formula (FC), formulas F1 (FE40) and F2 (FE20) enriched with 40% and 20% fish powder respectively, were prepared with fixed proportions of ingredients. The contents of macronutrients (proteins, lipids, carbohydrates, total sugars) and micronutrients (iron, zinc, calcium, magnesium) were measured using standard protocols. A 7-point hedonic scale was used to assess the overall acceptability (DOL) of the porridges prepared with the two formulas (FC and FE40) to mother-child pairs.

RESULTS
All formulas meet WHO standards for nutrient composition (carbohydrates, proteins, lipids and energy) with high levels of magnesium (129.2 - 202.2 mg/100g). The addition of fish powder in proportions of 40% and 20% contributed to the enrichment of zinc and iron, resulting in concentrations of 6.5 mg/100 g and 11.8 mg/100 g for FE40 and 4.52 mg/100 g and 10.13 mg/100 g for FE20. The concentration values reach 150% and 93% of the recommended zinc and iron intakes respectively for FE20. The fortified formulas have a high calcium content, with values ranging from 427.2 to 820.6 mg/100 g. Based on the overall average DOL values, both (FC and FE40) formulas were acceptable to most infants (over 75%), with an acceptability index greater than or equal to 70%.

CONCLUSIONS
This formulation strategy could be used locally to produce a high nutritional value infant formula. EF40 is well accepted by children and could be an appropriate local complementary food. Furthermore, timely introduction of food tastes and textures are the best predictors of child acceptance.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_033

STRUCTURAL CHANGES OF HUMAN MILK UNDER SIMULATED INFANT GASTRIC CONDITIONS AFFECT INTESTINAL NUTRIENT BIOACCESSIBILITY

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BACKGROUND AND OBJECTIVES
A series of extensive studies undertaken over the recent years by our research group has provided a comprehensive analysis of the influence of human milk (HM) composition on the structural changes observed during *in vitro* gastric infant digestion, affecting the bioaccessibility of proteins, fats and carbohydrates, and their further small intestinal hydrolysis. The studied variations in HM composition were due to the gestation length and the lactation period; and colostrum and mature HM samples were examined against cow's milk and selected commercially available milk formulas.

METHODS
The digestion progress and nutrient bioaccessibility were simulated using a miniaturised *in vitro* semi-dynamic digestion model and by applying conditions representative of the infant digestive system. Gastric emptying was imitated by collecting samples of gastric content at regular time intervals. Phase separation of the digesta was monitored by laser light scattering measurements at various stages of the digestion experiment.

RESULTS
The kinetics of digestion and the release of nutrients from HM were closely related to the structural changes the milk was undergoing under gastric conditions. Low pH has led to flocculation of fat droplets and coagulation of milk proteins, which resulted in fat creaming and/or sedimentation of coagulated proteins, while a progressive digestion of proteins and lipids was observed too. This phase separation affected the amounts of lipids, proteins and carbohydrates removed from the stomach at various stages of digestion, and their further degradation under small intestine conditions.

CONCLUSIONS
Our studies are crucial in revealing the complex structural changes that HM undergoes in the stomach. Experiments of this type remain a challenge, not only due to small volumes of some milk samples, particularly colostrum, that can be obtained for research purposes, but also because of the complexity of digestion processes they intend to replicate. Our findings highlight the critical importance of accurate nutritional strategies for the new-borns, especially when HM substitutes are required.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_038

IMPACT OF MALTING AND GERMINATION ON RETENTION OF CALCIUM, IRON, ZINC, PHYTIC ACID AND SENSORY PROPERTIES OF THE TAKE HOME RATION COMPLEMENTARY FOOD MIXES OPTIMIZED TO MEET THE REVISED NATIONAL FOOD SECURITY ACT STANDARDS, FOR UNDER 2 YR CHILDREN OF INDIA

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BACKGROUND AND OBJECTIVES

Complementary feeding is essential for growth and development after 6 months. Many traditional complementary foods lack sufficient nutrient density, leading to micronutrient deficiencies. This study assesses how processing techniques affect the nutritional profile and sensory acceptability of complementary food mixes, aiming to develop optimized formulations that align with the revised 2023 National Food Security Act standards for children 6–35 months in India.

METHODS

This study built upon a previously optimized complementary food formulation, developed using a Mixture Design approach, to create nutrient-dense food mixes for children. The base formulation included wheat, pulses, milk powder, groundnuts, gingelly seeds, and plant-based oil, with locally sourced ingredients processed through malting and germination. Processed ingredients were incorporated into the optimized proportions. Nutrient levels were assessed pre- and post-processing. The processed optimized formulation was used to create three variations. Variations include: “Dry Dates Powder”, “ Low Refined Sugar (as per WHO guidelines)”, and Spices/Condiments”. Sensory evaluation with 20 semi-trained panelists using a nine-point hedonic scale (acceptability >6) compared the variations to Telangana’s Take Home Ration “Balamrutham.”

RESULTS

Processing raw ingredients through malting and germination enhanced their nutrient profile. Malting wheat increased calcium (50.64 to 52.97 mg/100g), iron (4.06 to 4.97 mg/100g), and zinc (2.97 to 3.13 mg/100g), while reducing phytic acid (643.79 to 318.10 mg/100g). Germinated Bengal gram contained 173.73 mg calcium, 6.93 mg iron, 3.78 mg zinc, and 231.5 mg phytic acid per 100g, while green gram provided 99.53 mg calcium, 4.96 mg iron, 2.87 mg zinc, and 196.96 mg phytic acid. The developed formulation contained 4.73 mg iron (78.8% Estimated Average Requirement, EAR), 219.37 mg calcium (54.8% EAR), and 2.78 mg zinc (103% EAR). Sensory evaluation showed high acceptability for variations with low refined sugar and spices/condiments (score 7.6), compared to the control product "Balamrutham" (score 7.8 score).

CONCLUSIONS

In conclusion, malting and germination improved the nutrient composition, while reducing phytic acid. The optimized complementary food mix showed enhanced nutrient density and acceptability, demonstrating the potential of processing techniques to enhance complementary foods and support child health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_039

IN VITRO DIGESTION OF A KIND OF WHOLE GRAIN BLEND AND ITS EFFECT ON GUT MICROBIOTA IN DIABETIC PATIENTS

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BACKGROUND AND OBJECTIVES
The glycemic index (GI) of common refined white rice (WR) is high, posing challenges for blood glucose control in diabetic patients. This study investigated the *in vitro* digestibility of a whole grain blend (WGB, composed of black rice, red rice, and brown rice) and its effects on the gut microbiota of elderly individuals with diabetes, aiming to evaluate its potential as a substitute for WR in diabetic diets.

METHODS
The WGB and control WR were cooked, and their total starch and amylose contents were measured. The INFOGEST *in vitro* digestion model was used to compare the starch hydrolysis rates and estimated glycemic index (eGI). Fecal samples from 20 elderly diabetic patients (aged 68.4±5.16 years) were collected, and *in vitro* fermentation was conducted with the digestive products for 24 h. The fermentation process was evaluated by measuring pH, short-chain fatty acid (SCFA) concentrations, non-starch polysaccharide (NSP) degradation, and microbial composition.

RESULTS
The final starch hydrolysis rates of WGB and WR were 69.76±5.71% and 73.02±6.16%, respectively, with corresponding eGI values of 73.43±4.49 and 77.55±2.64. WGB exhibited lower starch digestibility and a reduced eGI compared to WR, likely due to its higher amylose content (P<0.05). WGB fermentation increased *Bifidobacterium* and *Lactobacillaceae*, reduced pro-inflammatory *Bacteroides fragilis* and *Enterocloster bolteae*, and released more arabinose and xylose. Additionally, WGB yielded higher isobutyrate, while WR contained more glucose and fructose in structure, leading to increased acetate production and a more acidic environment, potentially boosting dysbiosis and inflammation. Functional analysis revealed that WGB upregulated pathways related to fatty acid elongation and fiber fermentation.

CONCLUSIONS
WGB demonstrated a lower GI in a simulated *in vitro* digestion model and exerted beneficial effects on gut microbiota composition. These findings suggest that WGB is a viable and health-promoting alternative staple food for diabetic patients, offering dual benefits in glycemic control and gut microbiome.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_042

EGG WASTE IN MEDICINE: A NOVEL APPROACH TO SUSTAINABLE HEALTHCARE

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BACKGROUND AND OBJECTIVES
Eggs are a daily staple in many diets worldwide. During their usage and processing, significant amounts of waste are generated. Annually, at least 7,894,962 tons of egg processing waste are produced globally, of which 777,000 tons are within the European Union. The utilization of these byproducts could lead to substantial economic, social, and health benefits. The objective of the study was to provide an updated review of the scientific literature regarding the medical use of waste products derived from egg production

METHODS
A comprehensive literature review and systematic analysis were conducted using various databases, including PubMed, Scopus, Web of Science, Scielo, ISI, and Ovid MedLine. The focus was on highlighting the significance and the vast quantity of egg waste products in human nutrition, as well as their preventive and clinical applications.

RESULTS
The processing of eggs and the production of egg-based products generate considerable amounts of animal byproducts, which can be categorized into two groups: solid (shells and membranes) and liquid (technical egg white). These byproducts are a rich source of biologically active substances and are of interest for preventive and clinical medicine. Egg white contains proteins and hydrolysates with antibacterial, anticoagulant, and antioxidant properties. Additionally, they exhibit ACE inhibitory activity. Eggshell membranes contain collagen, keratin, glycosaminoglycans, including hyaluronic acid. For these reasons, they find applications in medicine for the prevention and treatment of various diseases, such as osteoarthritis, eye diseases, wound healing, tissue engineering, cardiovascular health, pulmonary conditions, and more.

CONCLUSIONS
The valuable properties and components of egg membranes and egg white, combined with the development of novel technologies and methods, make them highly applicable and effective in medicine.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_043

RETENTION OF ANTHOCYANINS IN GRAPE PEEL EXTRACT MICROENCAPSULATED WITH AMAZONIAN BUTTERS USING SPRAY CHILLING

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BACKGROUND AND OBJECTIVES
Grape peel extracts are rich in polyphenolic compounds, with anthocyanin (malvidin-3,5-diglycoside) as the main pigment, offering applications as natural dyes in food systems such as dairy, confectionery, and meat substitutes. These phenolic compounds provide significant health benefits, including antioxidant, antimicrobial, and antiviral properties. This study aimed to encapsulate grape peel extracts using the spray-chilling technique with Amazonian butters (Murumuru, Tucumã, and Cupuaçu) as encapsulating agents.

METHODS
For the production of microparticles by spray chilling, the blends containing Amazonian butters (60 %) and fully hydrogenated palm oil (HPF) (40 %) were melted in a water bath at 70°C. Regarding the microparticles produced with 60% murumuru butter, tucumã, and cupuaçu, and 40% HFP. Once fully melted, the blends were homogenized on a magnetic stirrer for 1 minute at 750 rpm to incorporate the PGPR (polyglycerol polyricinoleate) emulsifier (4 g by weight relative to lipid materials). The mixture was then fed into the atomizer nozzle (double-fluid model with 3.0 mm diameter) at a flow rate of 10 ml/min. The air flow rate was 35 L/min, and the cooling air temperature was 1°C.

RESULTS
The RESULTS of this study showed total monomeric anthocyanins and encapsulation retention values of 1006 ± 0.05, 920 ± 0.72, and 972 ± 0.12 mg malvidin-3-glucoside per 100 g, with retention efficiencies of 92%, 84%, and 88% for MM_P, TC_P, and CP_P, respectively. These values were found to be statistically different ($p < 0.05$). The RESULTS suggest that the use of different butters as encapsulating materials influenced both the levels of anthocyanins and the encapsulation efficiency.

CONCLUSIONS
Murumuru butter showed the highest encapsulation efficiency, followed by Cupuaçu and Tucumã. These RESULTS highlight the potential of Amazonian butters as effective encapsulating materials. However, further studies on storage stability are necessary to evaluate long-term protection due to potential lipid matrix reorganization.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_044

ASSESSING THE AVAILABILITY AND QUALITY OF IODIZED SALT IN SENEGAL, WEST AFRICA

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BACKGROUND AND OBJECTIVES

In Senegal, salt fortification with iodine is mandatory to address iodine deficiency and its' associated disorders. The impact of mandatory fortification on public health depends, in part, on the availability of food vehicles that meet fortification standards (FS). The objective of this study was to determine to what extent salt was iodized, and what proportion conforms with the Senegalese FS to help inform programming efforts.

METHODS

A cross-sectional market survey was conducted in Dakar and Thies. All salt brands available on the market were collected. Samples were first qualitatively tested for potassium iodate using a rapid test kit. Negative samples for potassium iodate were then analyzed for potassium iodide by a colorimetric assay. Composite samples (CS) were prepared from positive samples by brand/type and analyzed by titration. Iodine content was compared with FS, which requires fortification with 20-60 mg of iodine per kg of salt (mg/kg). CS RESULTS were extrapolated to native samples to account for the market share of brands and to allow analysis by relevant characteristics.

RESULTS

Overall, 141 salt samples were collected, of which 75.9% were fortified according to the qualitative test. The iodine content of 42 CS of 25 brands was determined. The median iodine content was 33.6 mg/kg [IQR: 18.5-61.3]. Less than half of the CS were within the FS range (45.2%). When the CS RESULTS were extrapolated to the native samples, only 36.4% were within the FS range. The proportion of adequately fortified salt was significantly higher in hypermarkets than in retailers (42.3% vs. 11.1%, $P<0.05$). The proportion of salt fortified below the standards was significantly higher for domestically produced salt (21.7%) than for imported one (3.7%), $P<0.05$.

CONCLUSIONS

Only 36.4% of salt in the Senegalese marketplace is fortified to standards. Further action is needed to close the fortification gap and ensure compliance with mandatory fortification standards.

CONFLICTS OF INTERESTS

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EPO3_045

INFLUENCE OF COW BREED AND LOCATION ON MILK QUALITY PROPERTIES AND WEST AFRICAN SOFT CHEESE YIELD

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BACKGROUND AND OBJECTIVES

Ghana has diverse cow breeds, yet there is a notable paucity of information on how these breeds differ in milk quality and cheese yield. This study explored the impact of cow breed and farm location on milk composition and indigenous cheese ("Wagashi") yield.

METHODS

Two samples (three litres) of fresh milk per breed were collected from four main breeds: ("Boboji" (Ghana shorthorn), "Degeji" (a *Bos indicus* x *Bos taurus* breed), "Mossiji" (a Sanga breed), and "Yakanaji" (a zebu breed), at two different locations in Ghana – Achubunyor (Savanna Region) and Kasalgu (Northern Region). The milk samples were analysed in triplicate for fat, protein, lactose, ash, total solids and density using an SP lactoscan ultrasonic milk analyser. Subsequently, the milk was processed into "Wagashi" using 3% w/w fresh *Calotropis procera* leaves as a coagulant and an induction cooking plate (80°C) for heating for about 30 minutes.

RESULTS

The findings indicate that the milk compositions and cheese yields of the breeds generally varied considerably ($p<0.05$) within and across the locations. The breed-location interactions had mean ranges of 4.12-5.83% fat, 3.05-3.16% protein, 4.60-4.77% lactose, 0.69-0.71% ash, 12.71-14.32% total solids and 1027.03-1028.98 kg/m3 density, with cheese yield between 31.10-39.85%. The "Mossiji" breed from Achubunyor had the highest milk fat (M=5.83%, SD=0.01%), total solid (M=14.32, SD=0.01%), and cheese yield (M=39.85%, SD=0.21). The "Boboji" breed from Achubunyor had the highest milk protein (M=3.16%, SD=0.05%), lactose (M=4.77%, SD=0.07%), (M=0.71, SD=0.01%), and the second highest (M=38.05%, SD=2.33%) cheese yield. Achubunyor's "Yakanaji" milk is the densest (M=1028.98 kg/m3, SD=0.01), second highest (M=3.13%, SD=0.00) protein and lactose (M=4.72%, SD=0.00%), and the lowest fat and total solid contents, with a cheese yield averaging 37.55%. The compositional traits are moderately correlated ($0.44>r<0.60$) with the cheese yield. The milk compositions fell within the recommended ranges for fresh cow milk while the cheese yields were relatively higher than those reported in literature.

CONCLUSIONS

The findings show breed and location influence cow milk composition, and "Wagashi" yield and potentially its nutritional and sensory properties. They also point to management/diet effects and individual animal effects. Cow milk can help improve food security and dietary diversity in Ghana if its production is sustainably intensified. The high cheese yields obtained herein point to best practices that could improve cheese processors' income.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_046

CHARACTERIZATION OF THE USE OF NON-SUGAR SWEETENERS IN ULTRA-PROCESSED FOODS LAUNCHED IN BRAZILIAN RETAIL IN THE FIRST YEAR OF IMPLEMENTATION OF DIRECTORS' COLLEGIATE RESOLUTION (RDC) 429/2020

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BACKGROUND AND OBJECTIVES
Non-sugar sweeteners present in food are widely used by the industry, but they raise concerns regarding their form of use and regulation in several products. Ultra-processed foods highly consumed by the Brazilian population contain in their composition, critical nutrients and cosmetic additives that stimulate their consumption. Among these additives are the presence of non-sugar sweeteners. Objective: To identify and classify the main non-sugar sweeteners used in the manufacture of ultra-processed foods available for sale in Brazil in 2022/2023 (beginning of the implementation of Directors' Collegiate Resolution 429/2020 in Brazil).

METHODS
The non-sugar sweeteners present in a sample of foods and beverages launched in Brazilian retail in the year 2022-2023 were identified from a database (Mintel-GNPD). Non-sugar sweeteners were identified through the list of ingredients and classified into 17 types according to the National Health Surveillance Agency (ANVISA). Ultra-processed foods were grouped according to retail sales categories. The frequencies of non-sugar sweeteners were calculated according to the categories of ultra-processed foods. In addition, the amount of non-sugar sweeteners and the frequency of their use in combination with added sugar were calculated. The main combinations of non-sugar sweeteners in the product sample were also observed through a Pearson correlation analysis ($p<0.01$).

RESULTS
The study revealed that 11.35% of ultra-processed foods contained at least 1 non-sugar sweetener, even when there was added sugar (591 had both non-sugar sweetener and added sugar). The categories of ultra-processed foods with the highest presence of non-sugar sweeteners were “bakery products”, “dairy products” and “chocolate products”. The most commonly used sweetener in the product sample was sucralose. It was found that 20.18% of nutritional beverages had 4 different non-sugar sweeteners, 1.03% of sweet fillings for breads had 5 sweeteners and 0.76% of candies and chewing gums had 8 different non-sugar sweeteners in their composition. The most common sweetener combinations found in foods were cyclamate and saccharin(significant positive correlation $p<0.01$).

CONCLUSIONS
The study showed the frequent use of sweeteners alone and in combinations in a sample of ultra-processed foods sold in Brazilian retail in the first year of implementation of RDC 429/2020. Furthermore, the concomitant use of sweeteners and added sugar reflects a possible reformulation trend driven by the implementation of RDC 429/2020 in the country.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_047

VARIABILITY IN THE NUTRITIONAL COMPOSITION OF FLOUR AND BREAD FROM DIFFERENT TRITICALE CULTIVARS

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BACKGROUND AND OBJECTIVES

Triticale production increases worldwide, especially in Europe which generates over 80% of the world's quantity. Its popularity is due to its high crop yield and tolerance to adverse environmental conditions such as acidic soils or drought. Given the growing demand for food resources and interest in using new raw materials for food products, triticale can become a sustainable and innovative solution in bread-making. This study analyzed triticale cultivars from the Republic of Moldova Ingen 33, Ingen 93, Ingen 40, Ingen 35, Ingen 54, Fanica, and Costel in order to evaluate the nutritional quality of flour and bread obtained from its.

METHODS

The moisture, fat, ash, protein content was determined according to the ICC 110/1, ICC 105/2, 104/1, ICC 136. For triticale flour the wet gluten has been determined according to SR 90:2007 whereas bread loaf volume, porosity and elasticity were analyzed according to SR 91:2007 method. The total polyphenol content (TPC) as well as the content of individual polyphenols was evaluated at an extraction temperature of 60 °C using an HPLC - DAD.

RESULTS

For triticale flours, the moisture content was less than 14% for all triticale varieties, indicating a long shelf life during its storage. The ash content varied between 1.5 and 1.73% whereas the protein content was higher than 13% for all triticale cultivars. The wet gluten content was in a lower amount for Ingen 93, Ingen 54 and Ingen 40 varieties. The fat content was not in a high amount whereas the carbohydrates content was higher than 70% for all triticale varieties. The value of TPC varied between 275.95÷591.6 mg/kg, the 4-hydroxybenzoic acid content varied between 1.20÷3.22 mg/kg, the vanillic acid content varied between 0.70÷1.70 mg/kg, the caffeic acid content varied between 0.15÷2.27 mg/kg, the chlorogenic acid content varied between 0.08÷0.40 mg/kg, the *p*-coumaric acid content varied between 0.18÷18.22 mg/kg and the rosmarinic acid content varied between 0.61÷2.67 mg/kg. Bread technological quality characteristics varied between 228÷265 cm3/100 g for specific volume, between 51.3÷62.4% for porosity and between 70.1÷83.4% for elasticity. From the nutritional point of view, the triticale bread humidity varied between 43÷45%, protein between 8.5÷9.2%, fat between 0.8÷1.2%, ash between 1.0÷1.2% and carbohydrates between 46.4÷47.3%.

CONCLUSIONS

According to the data obtained it may be concluded that triticale flour has a high nutritional value being a valuable source of phenolic acids which possess antioxidant properties and may lead to bakery products of a high nutritional and technological quality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_048

ASSESSMENT OF FOOD AND NUTRITIONAL SECURITY AMONG WORKERS IN AN INDUSTRIAL COMPLEX IN A COUNTRYSIDE MUNICIPALITY OF SÃO PAULO STATE: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

In Brazil, the Workers' Food Program (PAT), linked to the Ministry of Labor and Employment, is considered the longest-lasting and most successful socioeconomic program in the country, benefiting around 21.9 million workers in 2024, 86% of whom have an income of up to 5 minimum wages (BRASIL, 2024). Although not originally designed for this purpose, the program has a significant impact on promoting Food and Nutrition Security (FNS) and on workers' health (GUILHERME et al., 2020). Food in the workplace has a direct influence on eating habits and health, in line with the guidelines of the World Health Organization's “Global Strategy on Diet, Physical Activity and Health” (WAXMAN, 2004). This study aims to verify the perception of FNS and the relevance of meals eaten in the workplace to the daily diet of workers in an industrial complex served by the Food Service (FS).

METHODS

This is a cross-sectional study of workers at an industrial complex in a large municipality in the state of São Paulo. The research was conducted with workers who attend the site's Food Service. Of the 260 individuals present at the SA, 175 chose to participate. The form was based on the Brazilian Food Insecurity Scale (EBIA), a short eight-point version (PENSSAN, 2022), and included a sociodemographic section. The EBIA classifies food insecurity (FI) as: food security, mild FI, moderate FI and severe FI (SPERANDIO; MORAIS; PRIORE, 2018). FI was graded by adding up the positive answers, given as “1”, and the negative answers, as “0”. The data was tabulated in Microsoft Office Excel® and analyzed in R software, with the creation of graphs and statistical analysis (TEAM, 2024).

RESULTS

The characterization of the participant population revealed that 88% were men (n=154) and 12% women (n=21). In terms of age, 42.3% of the participants were up to 30 years old, 33.1% were between 31 and 40 years old, and 24.6% were over 40. As for color/race, 57.14% identified themselves as white, followed by brown (20.57%), black (20%), indigenous (1.71%) and yellow (0.57%). had mild IA, 5.14% moderate and 1.14% severe. Thus, the majority (n=123) were food secure, and 29.7% (n=52) had some degree of FI.

CONCLUSIONS

The vast majority of the population surveyed is food insecure. It is necessary to carry out evaluations of institutional SA in order to obtain data on the nutritional quality of the meals, as well as the nutritional status of the workers and the state of FNS.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_049

CHANGES OF EATING PATTERNS AMONG INTERNATIONAL MEDICAL STUDENTS IN BULGARIA

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BACKGROUND AND OBJECTIVES

International mobility of young people affects their lifestyle and alongside their routine everyday life including the eating habits and food selection. In recent years more international medical students coming from neighboring countries selected Bulgaria to live and to receive their medical training. Although some similarities with Bulgarian, the new setting changes their traditional nutrition patterns.
The aim of our study is to assess the perception and the attitude towards changes in food and dietary habits of International Medical students from 3rd and 4th grade, influenced by the new environment in Bulgaria.

METHODS

The study was conducted during September-October 2024 among international students from 3rd and 4th grade at Medical Faculty, Sofia University, Bulgaria. The total number of 85 international students completed the study. Data was collected by specially designed pre-tested questionnaire with 25 questions, divided into 2 parts. The first part was related to demographic characteristics. The second part of the questionnaire was to assess the perception and the attitude of the students towards food and nutrition in general, and related to the new environment, to evaluate the changes of their dietary patterns in the new country, and how these changes reflect on their body weight.

RESULTS

The majority of the international students were from neighboring countries of Bulgaria - Turkey and Greece. More than half of them didn`t describe significant changes in their eating patterns as they share some similarities between the cuisine of their own countries and Bulgarian cuisine. The Turkish students reported some problems with the finding and selection of some kind of meats, related to their religious culture but they take advantage of the availability of plenty of restaurants with ready-to-eat Turkish meals in Sofia. One of the most significant differences among all the students was a lower fish consumption which is influenced by the availability on the market. Also, there are lack of time and some ingredients to prepare their national meals at home.

CONCLUSIONS

The eating pattern and food selection of international students were not substantially influenced by the new environment most probably because of many geographical and cultural commonalities including culinary traditions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_050

EVALUATION OF KNOWLEDGE, ATTITUDES, SELF-REPORTED PRACTICES, AND RISK PERCEPTION OF FOODBORNE DISEASES AMONG FOOD HANDLERS IN A FOOD SERVICE UNIT IN BOTUCATU: A PILOT STUDY

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BACKGROUND AND OBJECTIVES

Collective feeding in Food and Nutrition Units (UANs) includes institutional services that meet a fixed demand from clients. The UAN is geared towards the operationalization of the nutritional supply to specific groups. It is an organized service that involves a series of activities designed to offer balanced meals, in line with dietary and hygienic standards, with the aim of meeting the nutritional needs of its clients, while respecting the financial limits of the institution (ABREU, SPINELLI, PINTO, 2011). The correct administration of these activities is fundamental to preventing Food and Waterborne Diseases (FWD), which are caused by ingesting water and/or food contaminated by bacteria, viruses, parasites or chemical substances. An AWD outbreak is identified when two or more people present similar symptoms after consuming the same food source or water from the same origin, usually in the same place. Common symptoms include nausea, vomiting, abdominal pain, diarrhea, lack of appetite and fever (BRASIL, 2024). A crucial strategy for assessing the hygiene and sanitation aspects of food handling is to carry out a diagnosis of food handlers' knowledge, attitudes, self-reported practices (CAP) and perception of risk of AWD. Even with periodic training, these measures are often not enough to guarantee correct adherence to hygiene practices, as they fail to effectively transform knowledge into appropriate attitudes and practices (LEANDRO et al, 2024). To analyze the knowledge, attitudes, self-reported practices and perception of risk of HAWD among food handlers in a large Food and Nutrition Unit (FNU) in the municipality of Botucatu/SP - Brazil.

METHODS

This was a descriptive cross-sectional study, carried out in July 2024, using questionnaires in a UAN in the municipality of Botucatu-SP. The initial sample consisted of 25 handlers and the questionnaires were designed for 7 areas of the UAN (stock, salad, butchery, cooking, dessert, distribution and hygiene).

RESULTS

The final sample consisted of 18 food handlers, the majority of whom were female, with an average age of 36.7±10 years, brown and with a high school education. The disconnection between the CAPs was identified in a considerable number of the questions, with emphasis on the validity of the food, the use of gloves and the handling of food with cuts and/or diseases.

CONCLUSIONS

Self-reported practices often do not correspond to observed practices, suggesting that handlers may omit their true beliefs and practices or carry out their tasks automatically. It is therefore crucial that further studies are carried out to identify the reasons why not all knowledge translates into practice. However, possible limitations such as lack of time were identified.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_051

POSSIBILITIES OF PRODUCING PASTA OBTAINED FROM DIFFERENT TRITICALE VARIETIES AND FERMENTED LIGHT BREWERS SPENT GRAIN

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BACKGROUND AND OBJECTIVES

Interest in the cultivation of *Triticale* grains has grown more and more. Nowadays it has also found applicability in the food industry. For this study were used seven different cultivars of *Triticale* from the Republic of Moldova, namely: Ingen 33, Ingen 93, Ingen 40, Ingen 35, Ingen 54, Fanica and Costel. Also, was used the brewers spent grain (BSG) in a fermented form in order to be incorporated in percentages of 10% and 17.5% in *Triticale* flour, to obtain pasta products. BSG was provided from pale (blonde) beer. The objectives of this study are to evaluate the quality of the pasta samples obtained.

METHODS

The pasta technological characteristics were characterized using AACC International Approved Method 66-50.01. For the characterization of the dry pasta fracturability and the pasta textural properties a Perten TVT-6700 device was used. The color evaluation of pasta samples was made using Konica Minolta Chroma Meter CR-400. The sensory evaluation of pasta samples was performed applying the nine-point hedonic scale.

RESULTS

The optimal cooking time varied between 11.30 min and 13.35 min, the lowest value being recorded for the sample obtained from the Costel variety and 10% BSF. Water absorption parameter increased at an addition of 10% BSF and decreased at an addition of 17.5% BSF. Cooking loss was generally enhanced by the addition of BSF, but this depended on the variety of *Triticale* used. The samples obtained with Ingen 93 and Ingen 35 had the lowest cooking loss, which ranged between 0.16% and 0.20%. Swelling index increased in the case of the samples with the addition of BSF. The value of 2.12, obtained with the Costel variety, with the addition of 17.5% BSF, was the highest. The addition of BSF had the effect of decreasing the brightness of the pasta samples, the lowest value of the L^* parameter being 48.47, in the case of the sample obtained with the Costel variety, without addition of BSF. From a textural point of view, it can be said that the value of the fracturability parameter decreased due to the addition of BSF, being the lowest in the case of Ingen 54 samples, when it had a value of 54.55 N, at a 10% BSF addition. The sensory analysis of the pasta showed that the tasters appreciated the best the pasta with an addition of 10% BSF.

CONCLUSIONS

The evaluation of how the addition of BSG influenced the quality of the pasta samples highlighted the fact that it is possible to successfully obtain pasta using whole wheat flour obtained from different *Triticale* varieties and BSF. It is gratifying to note that the seven types of different *Triticale* varieties are finding applicability in the food sector.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_052

PHYSICO-CHEMICAL AND CONSUMER ACCEPTANCE OF WHITE BREAD WITH DIFFERENT LEVELS OF GERMINATED BUCKWHEAT FLOUR ADDITION (FAGOPYRUM ESCULENTUM)

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BACKGROUND AND OBJECTIVES

White bread is consumed the most, but it is known that the refining process leads to a considerable loss of nutritional compounds. Thus, it is necessary to optimize the nutritional profile of this food product. Germinated buckwheat flour (BGF) can be used as an addition ingredient to white bread recipe because they have a valuable nutritional profile. The objectives of this study are to establish the optimal percentage of addition.

METHODS

To evaluate the bread physical characteristics, the following were determined: specific volume, porosity and elasticity. A Konica Minolta CR-400 colorimeter was used to highlight the crust and the crumb color. The textural characteristics were evaluated using a Perten TVT-6700 device. The microstructure of bread was analyzed with a Motic SMZ-140 stereo microscope, with the 20 x objective. The 9-point hedonic scale was used as a sensory method of analysis.

RESULTS

The specific volume of bread obtained by adding flour from buckwheat germinated for two days, without radicles, increased at the same time as the percentage of BGF increased. From a value of 163.78 cm^3/100 g, the specific volume increased to 193.86 cm^3/100 g (5% BGF). At four days, increasing the percentage of BGF produced a decrease in specific volume. Porosity also increased, from 70.54% to 76.54%, and at 7% addition it decreased to 73.37%. Elasticity increased from 91.92% to 93.67% and decreased to 91.53% at 7% addition. The crust color parameter L^* varied between 76.51÷ 62.96 in the second day of germination. The values of the parameter a^* ranged from 3.91 to 9.46 and for b^*, from 26.97 to 30.80. From the textural point of view, the value of gumminess decreased from 8.68 to 5.26. Cohesiveness and resilience have also decreased. Regarding the crumb microstructure of bread samples, it was deduced that the supplementation with BGF changed the size of the pores, but also their distribution in the structure of the bread crumb. The sensory analysis made it possible to highlight the fact that BGF did not negatively influence the opinion of the tasters in terms of quality taste indices. The samples with the addition of BGF without radicles have a higher quality compared to those obtained with radicles.

CONCLUSIONS

The study made possible to highlight the fact that the addition of BGF can be successfully used in the recipe for the manufacture of white wheat bread, without negatively affecting the quality indicators and consumer perception. An optimal supplementation level of 5% BGF was established at the end of the study.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_054

FOOD FUNCTIONALITY TARGETING THE SYNTHETIC PATHWAY OF PRO-INFLAMMATORY LIPID MEDIATORS FOR THE PREVENTION OF CHRONIC INFLAMMATION

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BACKGROUND AND OBJECTIVES

Chronic inflammation is an underlying pathological condition of lifestyle-related diseases or chronic diseases. Consequently, prevention and improvement of chronic inflammation are important for extending healthy life expectancy. Pro-inflammatory lipid mediators, prostaglandin (PG) E_2 and leukotrienes (LTs), induce and exacerbate chronic inflammation. Although inhibitors on cyclooxygenase (COX) catalyzing the first step of PGE_2 synthesis and 5-lipoxygenase (5-LOX) catalyzing the first step of LTs are already in clinical use, long-term preventive use is difficult due to the development of side effects. Therefore, we explore novel functional food ingredients targeting the synthetic pathway of PGE_2 and LTs, which can be used safely and continuously to prevent chronic inflammation.

METHODS

Changes in the expression of COX-2 and microsomal PGE synthase-1 (mPGES-1) which is the final enzyme of PGE_2 production were analyzed by real-time PCR and western blotting. Inhibitory effects on mPGES-1 activity from the substrate PGH_2 to PGE_2 and 5-LOX activity from arachidonic acid to the product were investigated, and the metabolites were analyzed by reverse phase-ultra performance liquid chromatography. The pathological amelioration was validated using some chronic inflammatory model mice such as psoriasis, colitis, and metabolic dysfunction-associated steatohepatitis.

RESULTS

We propose novel food functions with chronic inflammation-preventing effects: cell-selective effect, dual inhibitory effect, and final PGE_2 synthase (mPGES-1)-targeting effect that suppress the production of PGE_2 and LTs. 1) Cell-selective effect: diosgenin as a plant steroidal saponin down-regulated COX-2 and mPGES-1 in infiltrated macrophages of hepatic inflammation without influences on homeostatic COX-2 expression in endothelial cells and ameliorated acute and chronic liver injury. 2) Dual inhibitory effect: red rice proanthocyanidin and malabaricone C derived from nutmeg inhibited 5-LOX and mPGES-1, and ameliorated LTs-related inflammatory diseases such as psoriasis-like skin inflammation and asthma-like airway inflammation. 3) mPGES-1-targeting effect: ellagitannins, ganatin A and granatin B, down-regulated mPGES-1 without influence on COX-2 expression in macrophage and lung cancer cell lines and had tissue repair effects on chronic colitis.

CONCLUSIONS

We have discovered functional ingredients with new concepts that target the synthetic pathway of PGE_2 or LTs. The functional ingredients may contribute to the prevention of chronic inflammation, avoiding the side effects generated by existing drugs.

CONFLICTS OF INTERESTS

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EPO3_057

EFFECT OF ACIDIC TREATMENT ON THE ALLERGENIC PROTEIN (TROPOMYOSIN) OF MEALWORM

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BACKGROUND AND OBJECTIVES
Mealworm (*Tenebrio molitor*) is recognized as an eco-friendly and sustainable source of protein, approved as a novel food by the European Union in 2021. Despite its benefits, allergenicity remains a potential concern associated with the consumption of edible insects. A muscle fibril protein, tropomyosin, has been identified as a major allergenic protein in mealworms. The pH plays an important role in the property and integrity of proteins. This study aims to examine the stability and immunoreactivity of mealworm tropomyosin to understand its characteristics under acidic treatment.

METHODS
Mealworms were subjected to various acidic treatments using different vinegars and acidic food additives, each conducted at different pH and soaking conditions. Proteins were extracted from the processed samples, and their profiles were analyzed using gel electrophoresis and western blot to assess changes in integrity and immunoreactivity.

RESULTS
Analysis using gel electrophoresis demonstrated that the integrity of major proteins was affected by acidic treatment. Furthermore, RESULTS from western blot analysis revealed that the immunoreactivity of mealworm tropomyosin was dramatically reduced following acidic treatment.

CONCLUSIONS
Acidic treatment reduced the immunoreactivity of mealworm tropomyosin by altering its structural integrity. This approach may serve as a potential food processing method to modify the immunoreactivity of food allergens.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_058

PHARMACOKINETIC ANALYSIS AND MODELING TO EXPLAIN LONG-TERM INTAKE OF THE FOOD-CONTAINING AMINO ACID ERGOTHIONEINE NECESSARY FOR COGNITIVE FUNCTION IMPROVEMENT

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BACKGROUND AND OBJECTIVES

A food-derived amino acid ergothioneine (ERGO) is currently used as a functional food that aims to maintain learning and memory in elderly people. ERGO is distributed to the brain after oral ingestion, and recognition by its specific transporter SLC22A4/OCTN1 may explain such efficient oral absorption and brain distribution. On the other hand, repeated oral intake of ERGO for 2 and 12 weeks in mice and humans is required for the improvement effect in cognitive function to appear, but the reason for this is unknown. The present study aimed to clarify details in ERGO pharmacokinetics to develop a physiologically based pharmacokinetic (PBPK) model that quantitatively explains the factors essential for the long-term ingestion of ERGO necessary in brain function improvement.

METHODS

Deuterium-labeled ERGO (d9-ERGO) was administered in mice at 1-10 mg/kg. ERGO concentration in the body was measured by LC-MS/MS. A mathematical model was constructed using the Napp program.

RESULTS

The terminal half-life of d9-ERGO after intravenous administration in plasma was ~24 days. Distribution of d9-ERGO to the adipose, muscle, and skin was rapid whereas that to the brain and blood cells was slow, compared to other organs. Thus, the brain distribution phase may be a rate-limiting in cognitive improvement by ERGO. The PBPK model was constructed to quantitatively explain the nonlinear pharmacokinetics of ERGO, revealing that the major critical factors in the brain distribution of ERGO are membrane permeability in the brain, distribution to erythrocyte precursor cells, and nonlinear kinetics of ERGO reabsorption in the kidney. The increase in neurogenesis after repeated ERGO administration was slowly increased, and this could be another critical factor for long-term administration necessary for cognitive improvement.

CONCLUSIONS

The PBPK model constructed can successfully describe the nonlinear disposition of ERGO after repeated oral administration and elucidate the critical factors in its improvement effect on brain function.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_060

OPTIMISING 'GREEN' SOLVENTS AND TECHNOLOGIES TO PRODUCE ALGINATE, A PLANT-BASED FUNCTIONAL FOOD INGREDIENT

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BACKGROUND AND OBJECTIVES

To meet the demands of sustainable and healthy foods, more sustainable practices and technologies are required to produce food ingredients. Alginate is a polysaccharide derived from brown seaweed that is becomingly increasingly used in the food industry. Alginate is a popular plant-based food ingredient, with a wide variety of functions including thickening, stabilizing and emulsifying. Due to this versatility, alginate is used in many foods, such as sauces, jams, ice creams, syrups, instant desserts, and jellies. Beyond these traditional uses, emerging applications include edible films, fat replacers in foods, nutraceutical delivery agents and food scaffolds. However, current alginate processing is resource-intensive and tends to use harmful solvents. This study aims to apply response surface methodology (RSM) to optimise the extraction conditions of alginate from *Alaria esculenta* using ultrasound-assisted extraction and citric acid to improve the environmental footprint of the extraction process.

METHODS

A series of alginate extractions were conducted in a box Behnken design (n=17). *A.esculenta* was pre-treated with 1:10 (w/v) 3% citric acid solution and subject to ultrasound treatment (30-70 minutes, amplitudes 60%-100% and temperatures 20°C-80°C). The full biomass from this step was subjected to 0.1 % sodium bicarbonate solution 1:20 (w/v) at 64 % amplitude, 23°C for 32 min using an ultrasonic processor (UIP500hdT, Hielscher Ultrasonics GmbH, Teltow, Germany). The supernatant was then precipitated with IPA at a ratio of 1:3 overnight at 4°C, centrifuged and freeze-dried to record alginate yields.

RESULTS

The highest yield of alginate was 3.7% (US treatment: 80°C, 50 min and 60% amplitude). This was more than three times higher than the lowest yield of 1.2% obtained at 50°C, 50 minutes, and 80% amplitude. Overall, higher temperatures (80°C) produced greater alginate yields.

CONCLUSIONS

Ultrasound-assisted extraction and citric acid can be utilized in alginate extraction processes. Temperature had a critical role in enhancing the extraction efficiency. Future analysis will incorporate the purity of the extracts to further optimise the extraction conditions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_061

COLOR STABILITY OF ENCAPSULATED ANTHOCYANIN EXTRACT FROM BORDÔ GRAPES BY SPRAY CHILLING APPLIED TO GELATIN GUMMIES

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BACKGROUND AND OBJECTIVES
The increasing demand for healthier food ingredients has driven the use of natural colorants. Grape skins, agro-industrial byproducts from winemaking, present a sustainable solution for obtaining anthocyanins, bioactive compounds widely used as natural colorants. However, these compounds are highly sensitive to processing and storage conditions, which may compromise their effectiveness. Spray chilling encapsulation emerges as a promising strategy to protect anthocyanins, enhancing their stability. This study evaluated the coloring efficiency and stability of gelatin gummies containing spray-chilling-encapsulated anthocyanins over 30 days of storage.

METHODS
Binary mixtures comprising fully hydrogenated palm oil (FHPO) combined with cocoa butter (CB) or Amazonian butters such as murumuru (MM), cupuaçu (CU), and tucumã (TU) were used as encapsulating materials. The emulsions, consisting of 60% butters, 40% FHPO, emulsifiers, and grape skin extract, were atomized to produce microparticles with coloring potential. Gelatin gummies were prepared using maltodextrin, unflavored gelatin, distilled water, sweetener, microparticles (natural colorant), citric acid, PGPR, and flavoring agents. The mixture was microwaved, homogenized using a magnetic stirrer with heating plates, and then refrigerated to solidify the gummies. The colorant efficiency was assessed through color parameters (L*, a*, b*), total color difference (ΔE), and hexadecimal (HEX) color standards. RESULTS, analyzed on days 0, 6, 13, 20, and 27, showed efficient color transfer to the gummies despite variations in ΔE during storage.

RESULTS
Anthocyanin degradation, evidenced by increased L* and decreased a*, was more pronounced in the CB treatment, which exhibited the highest ΔE and significantly differed from the other treatments ($p < 0.05$). The MM treatment presented the lowest ΔE, while CU and TU showed no significant differences ($p < 0.05$). Despite the perceptible changes indicated by ΔE, visual variations observed in HEX standards did not negatively impact the gummies' appearance.

CONCLUSIONS
, spray-chilling-encapsulated colorants utilizing Amazonian butters are viable and sustainable alternatives for the food industry, showing significant potential for application in gelatin gummies. Moreover, replacing conventional fats such as palm oil and cocoa butter with Amazonian butters enhances the sustainability of the process.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_062

A COMPREHENSIVE INSIGHT IN SOY FOODS: CONSUMPTION PATTERNS IN THE CENTRAL BALKANS REGION, HEALTH BENEFITS ASSOCIATED WITH ISOFLAVONES, AND SAFETY CONCERNS

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BACKGROUND AND OBJECTIVES
The increasing global consumption of soy-based foods, attributed to their nutritional value and associated health benefits, underscores the significance of soy isoflavones (daidzein, glycitein, and genistein) for various nutritional and health-related applications.

METHODS
In this research, a comprehensive analysis of 94 soy-based food products and 21 food supplements (FS) marketed in the central Balkans region (Republic of Serbia and Republic of Srpska), included isoflavone and biogenic amine (BA) profiling by high-performance liquid chromatography as well as toxic metal(loid)s determination by inductively coupled plasma with mass spectrometry.

RESULTS
The isoflavone content varied significantly across food groups, with an average of 611 mg/kg. Soybeans, flours, and flakes exhibited the highest isoflavone levels (1787 ± 507 mg/kg), while soy sauces showed the lowest (15.3 ± 11.1 mg/kg). FS displayed a wide range of isoflavone concentrations (0.05–71.0 mg/dose unit), with deviations from labeled values often exceeding acceptable limits. Isoflavone intake was estimated using national food consumption data, revealing substantially higher intake among vegetarians in Serbia (119–156 mg/day) compared to the general population (1.4 mg/day). Regional comparison showed significantly lower intake in the Republic of Srpska (0.23 mg/day). Health benefits were expected only in the case of the vegetarian consumers in Serbia, as this population group primarily met recommended intake levels for menopausal symptom relief (≥70 mg/day) and cardioprotective effects and osteoporosis prevention (≥90 mg/day). Interestingly, FS contributed modestly to the recommended intake, with only one FS fully meeting the dose required for menopausal symptom relief. Risk assessment highlighted potential health concerns, including BAs in fermented soy foods and toxic metal(loid)s in FS. Histamine and tyramine levels posed minimal risk for healthy consumers but exceeded safety thresholds in some cases for individuals on MAOI therapy. Elemental analysis of FS revealed low additional intake of Pb, Cd, and Hg but raised concerns over As, which increased dietary exposure by up to 10% on average and 23% in case of high-consumption.

CONCLUSIONS
This research advances understanding of the health impact of soy-based diet, identifying both benefits and risks. While soy isoflavones offer significant health benefits, depending on intake levels, risks related to the exposure to BAs and toxic metal(loid)s need careful consideration, particularly in vulnerable population groups.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_063

EFFECT OF CIDER VINEGAR ON ANTHROPOMETRIC PARAMETERS IN OBESE PEOPLE

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BACKGROUND AND OBJECTIVES
Obesity is a chronic pathology for which curative and preventive measures are constantly sought. One of these measures is the use of apple cider vinegar.
The aim of our study was to evaluate the effect of apple cider vinegar on anthropometric parameters in obese individuals.

METHODS
We conducted a comparative longitudinal study at the obesity unit over a period of one month. The study involved 50 obese patients, divided into two groups: RHV+ and RHV-. We defined T0 as the day of recruitment and T1 as the time of the check carried out one month after T0.

RESULTS
The average age of the study population was 41.4 ± 13.74 years, divided into 28% men and 72% women. The mean body mass index of both groups at T0 was 39.34 ± 7.16. The average duration of obesity in patients was 16.38 ± 8.7 years. The average weight loss was 3.83 ± 1.97 kg in the RHV+ group and 1.16 ± 1.33 kg in the RHV- control group, with a maximum weight loss of 10.5 kg and 3. 8 kg respectively in the RHV+ and RHV- groups. Univariate analysis revealed statistically significant associations between anthropometric parameters measured at T0 and those measured at T1.

CONCLUSIONS
It appears from our study that nutritional support, based on a hypocaloric diet with apple cider vinegar supplementation, demonstrated notable effects on the anthropometric parameters of obese individuals.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_064

ADHERENCE OF TUNISIAN DIABETIC WOMEN TO THE MEDITERRANEAN DIET

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BACKGROUND AND OBJECTIVES
The Mediterranean diet, characterized by a high consumption of fruits and vegetables, a low consumption of meat and dairy products, is considered one of the healthiest dietary models. However, the current way of life weakens the transmission of family food values and contributes to the loss of traditional references.
The objective of this study is to know the degree of adherence of a sample of diabetic women to the Mediterranean diet (DietMed).

METHODS
The study is carried out on 105 diabetic women followed at our consultation. Eating behavior was assessed using the 14-Item Mediterranean Diet questionnaire. The total score ranged from 0 to 14 and was categorized into three adherence groups: low (0 to 5), medium (6 to 9), and high (≥10).

RESULTS
The average age of the patients was 52.11±14.25 years. Diabetes has been evolving on average for 12.38 ± 8.2 years. The average body mass index (BMI) was 30.45 ± 6.23 kg/m2, the average waist circumference = 108.2 ± 14 cm. The majority of our patients (81%) had average adherence to DietMed, 8 had low adherence and 12 had maximum adherence. There was no significant correlation between DietMed adherence score and: age, education level, marital status, place of residence, waist circumference, BMI, type and duration of diabetes.

CONCLUSIONS
Adherence to the Mediterranean diet is far from optimal despite its benefits demonstrated in the general population and in diabetics. Dietary education for diabetics must always take into account eating habits and encourage them to re-adopt our traditional healthy lifestyle.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_065

SPRAY CHILLING PRODUCTION OF SOLID LIPID MICROPARTICLES ENCAPSULATING CAROTENOIDS FROM ANNATTO (BIXA ORELLANA): EFFECTS OF EXTRACTION METHODS AND WALL MATERIALS ON PHYSICOCHEMICAL STABILITY

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BACKGROUND AND OBJECTIVES
Carotenoids are bioactive compounds valued for their antioxidant properties and natural pigmentation but are sensitive to light, heat, and oxidation, limiting their stability. Annatto (*Bixa orellana*) is a key source of bixina, a lipophilic carotenoid widely used in food. This study aimed to develop solid lipid microparticles (SLM) using spray chilling to enhance the stability of bixina, preserving its bioactivity and functionality during storage. The influence of two wall materials, GRINDSTED and DIMODAN, combined with two extraction methods (mechanical stirring and ultrasonication) on the physicochemical stability of the encapsulated compounds was evaluated.

METHODS
Four treatments were evaluated: GRINDSTED as the wall material with mechanical stirring for extraction (GT); GRINDSTED with ultrasonication (GU); DIMODAN with mechanical stirring (DT), and DIMODAN with ultrasonication (DU). Carotenoids were extracted by heating the wall materials to 70 °C to ensure the fusion of fatty acids, followed by mixing with powdered annatto seeds for 30 minutes. For ultrasonication, a digital sonifier (200 W, 20 kHz) was used. SLM were produced in a spray chiller under controlled conditions (10 mL/min feed rate, 1 °C cooling air). Samples were stored at 35 °C with and without light for 60 days. Analyses were conducted at five time points (days 0, 15, 30, 45, and 60) to assess bixina content (mg/g), antioxidant activity (ABTS, TEAC μmol/g), total phenolic content (mg GAE/g), and color variation (ΔE).

RESULTS
Initial bixina content ranged from 26.156 ± 0.003 mg/g (DU) to 26.527 ± 0.003 mg/g (GT). Antioxidant activity was highest in DT (3.386 ± 0.011 μmol/g) and lowest in GU (2.792 ± 0.009 μmol/g). During storage, bixina degradation was more pronounced under light exposure. At day 60, DT exhibited the highest bixina retention (13.629 ± 0.001 mg/g), while DU showed the lowest (7.596 ± 0.005 mg/g). ΔE values indicated significant color variation, particularly in DT (33.060 ± 0.046) under light. Phenolic content remained stable across treatments and storage conditions.

CONCLUSIONS
The combination of DIMODAN and mechanical stirring produced SLM with high bixina retention and antioxidant activity, showcasing its potential as a carotenoid encapsulation matrix. Ultrasonication was less effective in preserving bixina. This study highlights spray chilling as a scalable, cost-effective method for stabilizing bioactives.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_066

NUTRITIONAL COMPOSITION AND FIBER CONTENT IN CHAÑAR FRUIT

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BACKGROUND AND OBJECTIVES

The Chañar is an Argentinian native tree, *Geoffroea Decorticans, Leguminosae, Fabaceae*, which grows from the south of Perú to the north of Río Negro. Its fruit is incorporated into the diet by indigenous peoples. The objective of this work was to determine the nutritional composition and fiber content of two varieties *Decorticans y Subtropicalis,* grown in the Arturo Ragonese Botanical Garden in the National Institute of Agricultural-livestock Technology (INTA), located in Hurlingham. Buenos Aires. Argentina.

METHODS

Total, insoluble and soluble dietary fiber: AOAC (2002) Official Method of Analysis 991.43. Proteins: AOAC (2002) Official Method of Analysis 2001.11 (with modifications). Ashes: Kirk et al. (1996). Fats: Soxhlet Method. Statistics: Anova and Tukey analysis. Software: Infostat 2011.

RESULTS

Fiber composition

	Geoffroea decorticans Var. Decorticans	***Geoffroea decorticans Var. Subtropicalis***
Total Fiber	**36 + 1.0b**	**46 ± 2.4a**
Insoluble Fiber	**2.8 ±0.3b**	**43 ± 0.6a**
High molecular mass soluble Fiber	**8.0 ± 1.0b**	**2 ± 1.8b**

Numbers with different letters in the same determination indicate significant differences ($p>0.05$)

In *Subtropicalis* variety a higher percentage of fibers was obtained; however, a higher ratio of potentially prebiotic soluble fibers was obtained in *Decorticans* variety A bread was made in which it is planned to determine its composition and carry out a sensory analysis.

CONCLUSIONS

In this field, its production is controlled by qualified staff. A plan has been designed in which it is foreseen to determine its composition and analyse its fiber composition. It is possible to add new natural raw materials with nutraceutical substances to food; nevertheless, it is necessary to control its agricultural production, to know its toxicity and its composition according to the place it grows, and the product has to be accepted by consumers

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_067

ENHANCING LIFE QUALITY THROUGH FOOD SCIENCE: THE DEVELOPMENT OF A NUTRITIOUS, FERMENTED SORGHUM AND PEARL MILLET PORRIDGE FOR SCHOOL LEARNERS

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BACKGROUND AND OBJECTIVES
The South African government established the National School Nutrition Programme (NSNP) to eliminate hunger and malnutrition barriers that prevent underprivileged children from learning. Many NSNP schools benefit from sponsored breakfast initiatives funded by large corporations; however, these programmes frequently compromise the nutritional content of breakfast foods. A nutritious breakfast porridge using indigenous grains could lead to progress in achieving SDGs, addressing hunger, and providing sustained energy for learners.

METHODS
The findings from the breakfast needs and preference survey conducted among school learners (n=405) informed the product development of a chocolate-flavoured sorghum and pearl millet instant porridge. The product development process involved controlled fermentation of sorghum, and consumer sensory assessment was conducted to inform changes for subsequent trials.

RESULTS
The nutritional analysis reflected that the developed instant porridge was rich in protein, dietary fibre, manganese, iron, zinc, vitamins B1, and B3. The nutritional composition of the instant porridge far exceeds the current NSNP breakfast offerings, making it a superior breakfast choice to fulfil the Recommended Daily Intake (RDI) deficiencies within the NSNP, while enhancing academic RESULTS, overall health, and welfare. Therefore, the developed porridge is a healthier and more sustainable choice for the NSNP.

CONCLUSIONS
The developed porridge addresses nutritional gaps within the NSNP and can enable improvement of school performance while simultaneously raising student attendance and cognitive function. Using indigenous grains strengthens regional farming operations and reduces farmers' reliance on imported grains while establishing greater biodiversity across agricultural lands. Its nutritional profile is improved by fermentation procedures, which increase nutrient absorption and sensory acceptability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_068

EFFECTS OF POSTHARVEST PROCESSING ON THE NUTRITIONAL QUALITY AND PHYTOCHEMICAL INTEGRITY OF FRUITS AND VEGETABLES: A COMPREHENSIVE REVIEW

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BACKGROUND AND OBJECTIVES
Fruits and vegetables are a great source of vital nutrients and bioactive substances that improve human health. Postharvest losses brought on by improper handling, storage, and processing, however, continue to be a serious issue, particularly in developing nations. The effects of postharvest processing on the physical, nutritional, and phytochemical qualities of fruits and vegetables are crucial for reducing waste and improving food security. The aim of this review is to investigate how postharvest processing methods, such as mechanical processing, drying, and blanching, affect the nutritional value, physical characteristics, and phytochemical makeup of fruits and vegetables. It aims to assess how various processing techniques affect the stability of bioactive compounds and nutrient retention.

METHODS
A comprehensive review of existing literature from various studies was conducted, focusing on the effects of different postharvest processing methods on the quality and nutritional value of fruits and vegetables. Sources included research articles, reviews, and scientific reports from databases such as Google Scholar and PubMed.

RESULTS
Postharvest processing methods such as blanching, drying, and mechanical processing have significant effects on the antioxidant and phytochemical content of fruits and vegetables. Thermal methods like blanching and freezing can degrade sensitive vitamins and phenolic compounds. Nonthermal and mechanical techniques can reduce nutrient losses but also result in diminished bioactive compounds, especially in the peel and seeds.

CONCLUSIONS
Maintaining the nutritional and phytochemical integrity of fruits and vegetables requires optimizing postharvest processing methods. To decrease losses and improve the health benefits of these foods, more research on non-thermal processing and creative storage options is required.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_070

NUTRITIONAL RISK AND QUALITY OF LIFE IN PATIENTS WITH ADVANCED OR TERMINAL CANCER AND PALLIATIVE CARE

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BACKGROUND AND OBJECTIVES
Define quality of life according to the nutritional risk presented by patients with advanced or terminal cancer.

METHODS
To prepare this systematic review, different databases were consulted such as: PubMed, Scielo, Google Scholar and EBSCO, in the which the search for scientific articles was carried out, with different designs such as such as systematic literature reviews, randomized clinical trials, meta-analysis, cohort studies, case-control studies in order to obtain high-quality scientific evidence. 50 studies were included for analysis. English and Spanish language, managing to analyze information from the collection matrices, nutritional risk quality of life, determining factors, palliative care and nutritional support at the end of life.

RESULTS
50 scientific articles were included that were reviewed, and they demonstrated that, in cancer patients, the deterioration of the quality of life and the state nutritional status is frequent, evidencing that the severity of malnutrition in these patients is associated with worse health outcomes, poorer prognosis, and lower quality life. According to the RESULTS obtained, a nutritional evaluation is important to assess the state in which patients are found according to the nutritional risk they have, studies evaluate the severity of malnutrition and cachexia since these are the biggest nutritional problems in this population that affect the health and quality of life of patients.

CONCLUSIONS
It is essential to know the determining factors that affect the nutritional risk of patients to use techniques that minimize side effects, as well as nutritional support measures that reduce interruptions of treatment. treatment and increase quality of life. Interventions should be considered, including physical activity, dietary counseling, supplemental nutrition, and enteral or parenteral feeding. to improve function, nutritional status and possibly quality of life, guided by a multidisciplinary team that includes nutritionists, other health professionals and caregivers or family members.

CONFLICTS OF INTERESTS
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EPO3_071

ALTERNATIVE PROTEINS FROM SEAWEEDS: PROTEIN DIGESTIBILITY AND ADVANCED STRUCTURAL CHARACTERIZATION

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BACKGROUND AND OBJECTIVES
Seaweeds have recently gained attention for their nutritional and functional potential as sustainable food sources. Seaweeds are rich in bioactive compounds, including polysaccharides, proteins, vitamins, and minerals. However, the digestibility and bioavailability of nutrients are affected by structural changes that take place during digestion. Understanding the impact of the multi-scale structure on the digestion mechanism and nutrient release will help maximize their nutritional potential for human consumption.

METHODS
Our study examines the relationship between the protein digestibility of three types of seaweeds, including *Ulva* (green), *Porphyra* (red) and *Saccharina* (brown), which was evaluated through *in vivo* experiments using growing pigs with T-cannulas inserted in the distal ileum, and the structural transformations taking place through the digestion process, which were characterized by Confocal Microscopy and Small Angle X-ray Scattering techniques.

RESULTS
Our RESULTS demonstrated that the intrinsic structural properties of seaweeds, such as cell wall composition and integrity, are critical to protein digestibility. The more intricate cell wall structures in *Saccharina* remain almost intact during digestion, hindering the accessibility of digestive enzymes and therefore, reducing protein digestibility. In contrast, cell wall structures in *Porphyra* and *Ulva* underwent significant changes, allowing protein release upon digestion.

CONCLUSIONS
These RESULTS will be key to optimize the nutritional benefits of seaweed-based foods on the basis of structure-digestibility relationship.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_073

IN VITRO BIO ACCESSIBILITY OF YELLOW FLESH CASSAVA GROWN IN GHANA

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BACKGROUND AND OBJECTIVES

Consuming yellow cassava has been shown in a study to have small but significant improvements in vitamin A status of children..This study sought to determine effect of processing on the in-vitro bio accessibility of carotenoids in yellow flesh cassava roots and leaves.

METHODS

Determination of in vitro bio-accessibility of carotenoids in yellow flesh cassava

The method was adapted from Hedre´n, *et al.*, (2002) with some modifications. Three grams (3g) of the cassava sample was weighed and ground in a mortar. For the oral phase of the digestion, 0.003grams alpha amylase was added to 0.005M saline solution. About 7.5 ml of the saline solution was added to sample and sonicated in a water bath at a temperature of 37ºC and pH of 6.8. After 10 minutes, the sample solution was acidified to pH of 3 using 0.01M HCl to stimulate the gastric phase. 1ml of porcine pepsin (40mg/ml) was added to the sample solution at pH 3 and incubated for an hour at 37ºC after which pH was brought up to 7 to stimulate the intestinal phase of the digestion. About 4.5 ml of a mixture of porcine pancreatin (4mg/ml) and porcine bile extract (24mg/ml) was added to the stimulated gastric fluid and 1% (w/v) alpha tocopherol. The final volume was adjusted to 25ml with physiological saline solution and incubated for two hours in a shaking water bath (100rpm at 37ºC). It was then centrifuged at 5000g for 45minutes at 4ºC.The supernatant was collected with a plastic pipette into a seperatory funnel containing 20ml of 25% (w/v) NaCl. 20ml of 95% ethanol and 15ml of petroleum ether were added and allowed to separate. The solution was washed with water and the organic phase collected and the absorbance read with an atomic spectrophotometer.

RESULTS

Processing had an effect on carotenoid bio-accessibility with carotenoids in the roots being more accessible than those in the leaves. Boiled roots contributed between 4 and 21% of the RDA for children less than 5 years and the boiled leaves contributed between 2.6 to 386% of the RDA for every 100 grams of food consumed which showed more potential to meeting the RDA.

CONCLUSIONS

Yellow cassava would serve as a promising source of provitamin A and the carotenoids in yellow cassava roots are more bio-accessible than cassava leaves. Processing also has an effect on the bio accessibility on total carotenoids in yellow cassava.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_074

QUALITY OF LIFE AND APPETITIVE TRAITS IN OLDER ADULTS: EXPLORING FOOD AND SATIETY RESPONSIVENESS DIMENSIONS

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BACKGROUND AND OBJECTIVES

The aging of the global population presents significant challenges in promoting optimal well-being among older adults (1). Quality of life (QoL) is associated in older adults with better physical and mental health, greater functional capacity, and a lower risk of depression and reduced mortality risk. QoL is associated with nutrition and appetite, which tend to decrease in older adults (2). There are two important aspects of appetite: Food Responsiveness (FR pro-intake), which is considered the main driver of food initiation, while the Satiety Responsiveness (SR anti-intake) is the primary driver of food cessation (3). High levels of FR and low levels of SR are associated with high BMI in both children and adults (4). There are no studies that address quality of life related to appetite traits in older adults. Objective: To explore the relationship between quality of life and appetite traits in older adults.

METHODS

A cross-sectional study was conducted on functionally independent older adults without diagnosed cognitive impairments (N=104; 62% women; mean age of 70.3 years, SD=6.44). QoL was measured using the WHOQOL-BREF questionnaire (physical health, psychological health, social relationships, and environment assessed domains), and eating behavior was assessed using the AEBQ questionnaire (pro-intake and anti-intake dimensions).

RESULTS

Mean scores for WHOQOL-BREF domains were 53.3 (SD 11.20). Higher levels in QoL aspects such as emotional well-being, cognitive function, and mental health (psychological health domains) are associated with a lower inclination to initiate food intake in response to external food cues (FR) ($p=0.03$). Additionally, high levels of support and social integration within the community (social relationships domains) are associated with lower levels of the feeling of satiety when eating or even afterward (SR) ($p=0.01$). No differences were observed associated with the sex or age of the participants.

CONCLUSIONS

: In older adults with a good perception of their mental health and integration in society (better QoL) there is less inclination to initiate eating and to stop eating. This is paradoxical compared to what has been reported in children and adults. This could be because, in older adults, the social aspect is highly relevant; if they are sharing food with others, the social environment may make them feel more comfortable and motivated to continue eating, which contrasts with their difficulty in initiating the eating process.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_075

EFFICACY AND SAFETY OF VIRGIN MORINGA LEAF HARVESTED ONLY FIRST YEAR IN JAPAN

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BACKGROUND AND OBJECTIVES
Moringa (*Moringa oleifera*) is a nutritious plant that grows in tropical regions. In Japan, moringa seeds are sown every year due to the cold temperatures in winter. Therefore, we developed Japanese moringa leaf (JML), which is harvested only in the first year after sowing the moringa seeds and air-dried at 40°C on the same day. We also developed virgin moringa leaf (VML), which has a limited growing period of 108 days. In this study, we evaluated the antioxidative activity and antioxidant content of VML and JML compared with moringa leaves cultivated in India (IML) and Brazil (BML), which are typically harvested and sun-dried from moringa trees that are several years old. Additionally, we investigated the effects of dietary JML on pregnancy, birth rates, and lipid metabolism in rats.

METHODS
VML, JML, IML, and BML were extracted with hot water, and their antioxidant activity was measured using the DPPH radical scavenging activity method. Polyphenols in each sample were analyzed by HPLC at 280 nm, and antioxidant components were detected by reacting with DPPH post-column using the on-line HPLC-DPPH method. In the animal experiment, 12-week-old male and female SD rats were divided into two groups and fed either a control diet based on the AIN-76 composition (CO group) or a diet supplemented with 10% JML dried powder (MO group). One pair of male and female rats were housed together for 4 weeks, after which the male rats were sacrificed. The female rats were monitored for pregnancy, abortion, and birth outcomes. Three weeks after birth, the female rats and pups were sacrificed, and tissue weights, as well as serum and liver lipid levels, were measured.

RESULTS
VML exhibited higher antioxidant activity than JML, IML, and BML. In all samples, four antioxidants were detected, and two of them were identified as 3-*O*-caffeoylquinic acid (3CQA) and 4CQA. Dietary JML did not affect pregnancy, abortion, birth numbers, or the sex ratio of offspring in rats. While dietary JML did not affect the body weight of the parents or offspring, it increased the weights of the liver, spleen, kidney, cecum, and testes in the offspring. Serum triglyceride and cholesterol levels in parental males and offspring were decreased by dietary JML. Additionally, hepatic triglyceride and cholesterol levels in parental females and offspring were decreased by dietary JML.

CONCLUSIONS
It was revealed that the major antioxidant of JML is 3CQA. While 10% dietary JML did not affect pregnancy, abortion, or birth numbers in rats, it might influence the development and nutrient metabolism of the offspring's organs through breast milk.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_076

IMPROVING THE SENSORY QUALITY OF COMPLEMENTARY FOODS: IMPACT OF ROASTING ON SENSORY ATTRIBUTES AND ACCEPTABILITY

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BACKGROUND AND OBJECTIVES
Acceptability in complementary foods is a key factor for their uses in households (1,2,3). This study assessed the impact of the roasting stage during production on the sensory attributes and acceptability of complementary foods based on local roasted products (cereal whole grain/vegetables and legumes and cereals/vegetables and legumes processed into flours).

METHODS
Sensory analyses such as discriminative tests and sensory characterization tests by Check-All-That-Apply (CATA) were used to assess the difference between the roasting stages and to characterize the sensory attributes of the two complementary foods (4).

RESULTS
RESULTS showed that roasting cereals, vegetables and legumes flours brought perceptible organoleptic changes to the complementary foods. Complementary foods from roasted flours were considered to have an “attractive” color, “thin” viscosity, “pleasant” smell, and “pleasant” taste compared to those from roasted whole grains with attributes such as “unpleasant” color, “thick” viscosity, and “unpleasant” taste.

CONCLUSIONS
Complementary foods from roasted flours were considered more acceptable (acceptability index>70%) than complementary foods from roasted grains (acceptability index=66%).

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_077

GOAT VS. COW DAIRY PRODUCTS DIGESTION AND INTESTINAL HEALTH IMPACT: IN VITRO STUDY USING DYNAMIC DIGESTION AND QUADRICELLULAR INTESTINAL EPITHELIUM MODELS

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BACKGROUND AND OBJECTIVES

Some consumers perceive goat dairy products as being easier to digest than cow dairy products. Several hypotheses have been suggested to explain this difference. Among these, it is believed that in goat milk, the higher content of short- and medium-chain fatty acids could promote lipolysis [1] and the lower alpha S1-casein content could facilitate proteolysis [2]. It is also suggested that goat milk could have positive impacts on inflammation [3]. The objective of this study is to unravel differences in the behaviour of both milks during digestion by comparing the dynamic *in vitro* digestion of goat and cow milks and yogurts, and the effects of their digesta on a quadricellular model of intestinal epithelium.

METHODS

Goat and cow milks and yogurts were formulated to be iso-proteic and iso-lipidic. They were digested using the DIDGI® dynamic *in vitro* gastrointestinal system. The kinetics of lipolysis and proteolysis were respectively measured by gas chromatography coupled with mass spectrometry and by o-phthalaldehyde method (n=3). A quadricellular model of intestinal epithelium (Caco-2, HT29-MTX, NCI-h716 and Raji-B) was stimulated with the intestinal digesta, and the gut barrier integrity was evaluated by trans-epithelial electrical resistance (TEER) for 24 hours (n=10-12). Expression of genes characteristic of different intestinal functions was quantified by RT-qPCR using a SmartChip device at 4h and 24h.

RESULTS

Lipolysis kinetics revealed a significantly greater release of fatty acids ($p<0.05$) during the gastric phase with goat dairy products compared to cow dairy products. However, no major difference was observed in the intestinal phase. Proteolysis kinetics were similar between species. TEER values were significantly higher ($p<0.05$) from 4 to 16 hours of stimulation with goat dairy products compared to cow dairy products, suggesting better intestinal barrier function with goat dairy products. Furthermore, goat dairy products increased TEER from 3 to 7 hours of stimulation as compared to control (i.e. culture medium alone) ($p<0.05$), whereas TEER values with cow dairy products did not. The analysis of gene expressions is underway to better characterize the underlying mechanisms.

CONCLUSIONS

The kinetics of lipid and protein hydrolysis did not appear to be a major factor distinguishing goat and cow dairy products. However, intestinal cells stimulation seemed to indicate a more favourable effect of goat dairy products on the intestinal epithelium barrier function compared to cow dairy products. Gene expression RESULTS will be used to characterize the other intestinal functions and to clarify the mechanisms.

CONFLICTS OF INTERESTS

Tanguy SAVIARD is a PhD student under a CIFRE agreement and an employee of the company EURIAL.

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EPO3_079

EFFECTS OF DIFFERENT PROPORTIONS OF DHA AND ARA ON COGNITIVE DEVELOPMENT IN INFANTS: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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BACKGROUND AND OBJECTIVES
The previous studies assessed the effect of docosahexaenoic acid (DHA, 22:6n-3) and arachidonic acid (ARA, 20:4n-6) supplemented infant formula on brain development and cognitive function in infants. However, the RESULTS were inconsistent. The aim of this systematic review and meta-analysis was to assess the effect of DHA and ARA supplementation on cognitive function in infants from randomized controlled trials (RCTs).

METHODS
We systematically searched and identified relevant literature from the PubMed, Web of Science, and Embase databases up to July 2024. Standard methods were applied to assess publication bias, sensitivity analysis, and heterogeneity among included studies.

RESULTS
A total of 9 RCTs were included in the study, which comprised 1,039 subjects. Meta-analysis showed significantly positive effects of DHA and ARA supplementation on cognitive development in infants (Standardized Mean Difference (SMD): 0.21; 95% CI: 0.03, 0.38). No significant difference was found on Mental Development Index (MDI) score (Weighted Mean Difference (WMD): 0.20; 95% CI: -0.03, 0.43) and Psychomotor Development Index (PDI) score (WMD: 0.12; 95% CI: -0.11, 0.35) in Bayley Scales of Infant and Toddler Development compared with control group. In subgroup analysis, when DHA/ARA was 0.5-1, PDI had a significant difference (WMD: 0.48; 95% CI: 0.03, 0.93) compared with the control group, with no significant between heterogeneity (I2=46.4%, *P*=0.155). In comparison to the control group, significant differences were observed in MDI when DHA/ARA levels were between 0.5 and 1 (WMD: 0.55; 95% CI: 0.07, 1.02), with no significant between heterogeneity (I2=51.6%, *P*=0.127).

CONCLUSIONS
In conclusion, when the DHA /ARA was 0.5-1 can significantly improve the cognitive function in infants.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_080

METABOLOMICS ANALYSIS REVEALED THE AMELIORATING EFFECTS OF POMEGRANATE SEED OIL ON RENAL OXIDATIVE STRESS AND INFLAMMATION IN DIABETIC NEPHROPATHY MICE

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BACKGROUND AND OBJECTIVES
Studies have shown that pomegranate seed oil has anti-inflammatory and anti-oxidative effects. However, whether this effect can alleviate renal inflammation and oxidative stress in diabetic nephropathy mice by improving metabolic pathways is still unclear. The aim of this study was to investigate the effects of pomegranate seed oil on renal oxidative stress and inflammation related metabolic pathways in mice with diabetic nephropathy.

METHODS
Pomegranate seed oil was given to establish a diabetic mouse model by combination of high fat and STZ. HE staining, PAS staining and metabolomics were used to analyze the kidney tissue of the mice.

RESULTS
Biochemical analysis and histology showed that pomegranate seed oil ameliorated diabetic kidney injury, and significantly reduced blood glucose, serum uric acid, creatinine and urine creatinine/urine protein ratio ($p<0.05$ compared with diabetic model group). Moreover, pomegranate seed oil intervention significantly increased anti-oxidative stress indicators in the kidney of diabetic mice, such as T-SOD, GSH and CAT ($p<0.05$). At the same time, it also significantly inhibited the expression of inflammatory factors TNF-α, IL-6, IL-1β ($p<0.05$). Metabolomics analysis revealed that 25 metabolites were down-regulated and 9 metabolites were up-regulated by pomegranate seed oil intervention compared with diabetic model mice. Pathway analysis revealed that the intervention of pomegranate seed oil primarily operated through pathways involving Beta-Alanine Metabolism, Phenylalanine and Tyrosine Metabolism, Alpha-Linolenic Acid and Linoleic Acid Metabolism, as well as Glutathione Metabolism, thereby reducing oxidative stress and inflammation in diabetic nephropathy.

CONCLUSIONS
Therefore, pomegranate seed oil is expected to be a natural functional oil with anti-oxidative stress and anti-inflammation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_081

PREPARATION AND EVALUATION OF THE ANTIOXIDANT ACTIVITY OF LACTO-FERMENTED VEGETABLES BASED ON CARROTS AND PURPLE CABBAGE

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BACKGROUND AND OBJECTIVES
The current study investigates the effects of lactofermentation on vegetables using carrots and red cabbage as samples. Lacto-fermentation is a traditional preservation method that uses lactic acid bacteria to convert sugars in vegetables into lactic acid.

METHODS
The aim of this work was to assess the benefits of lacto-fermentation by evaluating antioxidant properties and some primary metabolites (fibres, ash) of carrots and cabbage. The vegetables were prepared according to a specific recipe and then immersed in a saline solution with dill and garlic. The fermentation was carried out at room temperature under anaerobic conditions for more than 4 weeks.

RESULTS
The RESULTS showed that fermented cabbage had a more remarkable antioxidant power (EC 50 = 0.16 µg/mL). fermented cabbage contains more polyphenols than carrots, with respective values of 0.45g /100g ; 0.28g /100g. Primary metabolic RESULTS showed that fermented cabbage is richer in fibre than carrots (8.01%; 2.55%).Ash values show that both fermented cabbages and carrots are rich in minerals (18.12%; 17.85%).Carrots have a much higher moisture content than cabbages (23.20%; 5.20). The RESULTS showed that the pH of the fermented vegetables was constant at pH 3.

CONCLUSIONS
In the light of these RESULTS, lacto-fermentation proved to be an effective method for the preservation of vegetables carrots and cabbage by improving their shelf life, antioxidant properties and metabolic profile. The RESULTS cover the way for future research on lacto-fermentation of other vegetables and its impact on human health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_082

BLACK-GRAINED WHEAT INTERVENTION AFFECTS METABOLITES RELATED TO AMINO ACIDS AND GLYCOLIPIDS METABOLIC PATHWAY IN FEMALE DIABETIC PATIENCE

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BACKGROUND AND OBJECTIVES
Changes of amino acid, glycolipids and other metabolism has been found in type 2 diabetes mellitus (T2DM). Whole grains is convincingly associated with reduced incidence of diet-related diseases, but whether it's helpful to correct the changes of metabolism in T2DM has not well been clarified. Black-grained wheat (BGW) is a new wheat variety and considered as a value-added product, this paper tries to provide a reliable evidence to identify the effects of BGW on glycemic control through adjusting metabolites related to amino acid and glycolipid metabolic pathway.

METHODS
Forty T2DM females from Beijing, China were randomly assigned to consume either the usual diet (n=20) or replaced part cereals by BGW diet (n=20) for 5 weeks. Fasting blood samples collected at baseline and the end of the trial, and metabolites were tested by UPLC-QE-MS. The separating metabolites were identified between the BGW and Ctrl. Groups with orthogonal partial least squares discriminant analysis (OPLS-DA) .

RESULTS
Average daily BGW intake in BGW group were 68.8±14.7 g. The changes in the levels of TG, insulin, HOMA-IR, and TNF-a were significantly lower in BGW group compared with Ctrl. group (1.35±0.71 mmol/L vs. 1.90±0.89 mmol/L, -1.14±2.79 mU/L vs. 4.32±12.48 mU/L, -0.57±1.01 vs. 2.40±7.41, 2.44±0.52 pg/mL vs. 1.94±0.38 pg/mL, $P<0.05$, respectively). Metabolic profiles showed there were 39 differential metabolites between BGW and Ctrl. groups, including 35 analytic metabolites decreased and 4 metabolites increased, which may have potentially been related with metabolic pathway of phenylalanine, tyrosine and tryptophan biosynthesis, and glycerophospholipid metabolism. Alterations of several lipids and lipid-like molecules, organic acids and derivatives, organic oxygen compounds, benzenoids, phenylpropanoids and polyketides, and organoheterocyclic compounds were found to be associated with the development of T2MD.

CONCLUSIONS

Partial replacement of refined cereals by whole BGW may improve the metabolic markers in T2DM via regulating the amino acid and glycolipid metabolisms.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_083

ANTIHYPERTENSIVE AND ANTIOXIDANT POTENTIALS OF PEPTIDE EXTRACTS FROM INDIGENOUS FERMENTED FOODS

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BACKGROUND AND OBJECTIVES

Fermentation-derived peptides have been shown to modulate various physiological processes such as antihypertensive and antioxidant effects. Despite the extensive variety of raw materials and food sources used in fermentation, bioactive peptides derived from indigenous fermented foods remain underexplored. The bioavailability and functional activities of these peptides are influenced by different factors such as enzymatic digestion that may alter their structure, concentration, and efficacy. This study investigated the antihypertensive and antioxidant potentials of peptide extracts from locally produced fermented food products.

METHODS

Peptides were extracted from 12 milk- and fish-based fermented food products by phosphate buffer extraction (crude extract) and simulated gastrointestinal digestion (GI digest). Ultrafiltration was performed to isolate bioactive peptide fractions (<3000 Da). Peptide concentration was quantified in both extracts while GI digests were further analyzed for angiotensin-converting enzyme (ACE) inhibition and for antioxidant activities using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging and ferric reducing antioxidant power (FRAP) assays.

RESULTS

GI digests exhibited higher peptide concentrations (16.0 to 108.3 mg/g) compared to their crude extract counterparts (0.2 to 46.1 mg/g), indicating enhanced release of peptides during digestion. ACE-inhibition assays revealed relatively higher inhibiting rates in milk-based fermented food digests (21.2 to 44.2%) than in fish-based fermented foods (3.9 to 22.8%). The digest also showed variability in antioxidant activities as measured by DPPH (2.1 to 12.4%) and FRAP (1.3 to 51.9 mg ferrous equivalent per g) assays.

CONCLUSIONS

Simulated GI digestion significantly improved peptide yield while preserving their bioactivities, demonstrating its potential as an effective method for producing bioactive peptides with health-promoting properties. The findings emphasize the value of indigenous fermented foods in functional food development, warranting further exploration of their health benefits, optimize production processes, and investigate their potential applications in preventing and managing chronic diseases.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_085

SAFETY ASSESSMENT OF EUCALYPTUS LEAF EXTRACT AS A FUNCTIONAL FOOD MATERIAL

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BACKGROUND AND OBJECTIVES

Eucalyptus (*Eucalyptus globulus*) leaf extract (ELE) with oenothein B as the active ingredient is marketed in Japan as a material for Foods with Functional Claims (FFC) to prevent obesity. On the other hand, eucalyptus essential oil is generally considered to be toxic because of reports of poisoning attributable to accidental ingestion and the presence of cyanogenic glycosides in some varieties. We evaluated the safety of ELE distributed as a commercial product.

METHODS

We investigated a commercially available ELE (product name: Eucagrandin) that is used in FFC and made by extracting with aqueous ethanol and then spray-drying to produce a powder. The ingredients were analyzed, and 1,8-cineole was quantified as an indicator of essential oil components using GC and GC/MS. A micronucleus test was conducted using ICR mice (male and female) by orally administering 2,000 mg/kg. A safety confirmation study was conducted in healthy Japanese adult men and women consuming ELE orally at the dose of 3,240 mg/day (oenthein B, 26 mg/day) for 4 consecutive weeks (UMIN000028377). Examinations were conducted at 0, 2, and 4 weeks after the beginning of the intervention and then again 2 weeks later.

RESULTS

No cyanide or cyanide glycosides (detection limit <0.1 ppm) or 1,8-cineole (<0.01%) was detected in ELE. The total polyphenol content was 24% (Folin–Ciocalteu's method; gallic acid equivalent), and the main components were gallic acid, oenothein B, ellagic acid, quercetin 3-*O*-β-D-glucuronide, and kaempferol 3-*O*-β-D-glucuronide. The micronucleus test yielded negative RESULTS. In the 9 male and 10 female subjects (51 ± 5 years old) who satisfied the test food intake rate criteria, the following parameters exhibited significant changes compared to their measurement at the start of the intervention: a decrease in diastolic blood pressure, ALB, and Hb in both men and women, and RBC in women; an increase in Na, T-Cho, WBC, Ht, PLT, and UA in both men and women, and UA in women. These changes were diagnosed as not being a clinical problem because they were within the reference range or were slight changes, and the values for each individual were also within the range of physiological variation.

CONCLUSIONS

Our RESULTS indicate safety of eucalyptus leaf extract.

CONFLICTS OF INTERESTS

The authors are employees of Nagaoka Co.

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EPO3_086

OMICS INSIGHTS INTO GERMINATION EFFECTS ON THAI RICE

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BACKGROUND AND OBJECTIVES
Rice is a staple food for over half of the global population and an important source of nutrition, particularly in developing countries. Its adaptability to diverse environments makes it vital for global food security. Studying the ion, metabolite, and protein profiles in rice can enhance its nutritional value, optimize its utilization, and inform healthier food choices.

METHODS
This study investigates the ionomic, metabolomic, and proteomic profiles of eight Thai rice varieties, comprising four white and four colored rice types, including the effects of germination on these parameters. High-performance liquid chromatography-mass spectrometry was employed for metabolomic and proteomic analyses, while inductively coupled plasma-mass spectrometry was used for ionomic analysis. In addition, antioxidant activity was measured to study the antioxidant properties of each rice and the impact of germination on the antioxidant profile.

RESULTS
The integration of these datasets revealed significant changes in the omics profiles due to germination. The RESULTS indicate that Tubtim Chumphae rice exhibits the highest antioxidant activity, which increases almost twofold upon germination. Furthermore, the increase in protein content is observed in germinated rice.

CONCLUSIONS
This study highlights the potential of germinated rice for developing plant-based protein products and personalized food development.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_088

HIBISCUS SABDARIFFA SHOT BEVERAGE: A NUTRITIONAL APPROACH FOR ENHANCING BIOCHEMICAL PARAMETERS IN OVERWEIGHT AND OBESITY

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BACKGROUND AND OBJECTIVES

Obesity is a critical global health issue that significantly increases the risk of developing severe metabolic diseases such as type 2 diabetes, cardiovascular diseases, and dyslipidemias. Functional ingredients, such as *Hibiscus sabdariffa* (hibiscus flower), have received increased attention for their bioactive compounds, including anthocyanins and polyphenols. These compounds exhibit antioxidant and anti-inflammatory properties that may help regulate lipid and glucose metabolism. This study aimed to evaluate the effect of a hibiscus-based shot beverage on the lipid profile of adults with overweight and obesity.

METHODS

A randomized, double-blind, controlled clinical trial was conducted. We included 60 participants in a control group (placebo shot) and an intervention group (Hibiscus shot). Both groups consumed their respective beverages daily for 8 weeks without altering their diet or lifestyle. Anthropometric, biochemical, and dietary parameters were assessed at baseline and the end of the intervention. Data were analyzed using Wilcoxon and Mann-Whitney U tests for statistical significance.

RESULTS

A significant reduction in both the percentage (%) and amount (kg) of body fat mass was observed exclusively in the group consuming the hibiscus shot when comparing baseline to final data (delta $\Delta = -1.34 \pm 11.50$, $p = 0.027$; $\Delta = -1.61 \pm 2.65$, $p = 0.041$, respectively). This finding occurred despite a significant increase in sugar intake ($\Delta = +39.87 \pm 70.03$, $p = 0.009$) and Body Mass Index ($\Delta = 0.42 \pm 0.77$, $p = 0.047$). Interestingly, a significant decrease in final concentrations of total cholesterol ($\Delta = -22.5 \pm 38.5$, $p = 0.019$) and glucose ($\Delta = -1.4 \pm 10.79$, $p = 0.016$) was detected in participants treated with the hibiscus shot, contrasting with the placebo group, where a significant increase in final glucose concentration ($\Delta = +9.17 \pm 12.01$, $p = 0.045$) was observed. No changes in triglycerides or LDL-c levels were noted in either group during the intervention.

CONCLUSIONS

Consumption of *Hibiscus sabdariffa* shot beverage improved lipid profiles, glucose levels, and body composition in adults with obesity, showing significant reductions compared to a placebo. These findings underscore its potential as a functional food for managing metabolic alteration associated with obesity.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_091

INDUCTION OF PHOSPHATIDYLCHOLINE SYNTHESIS AS A POTENTIAL MECHANISM UNDERLYING COGNITIVE ENHANCEMENT INDUCED BY ORAL INGESTION OF YEAST-DERIVED RNA

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BACKGROUND AND OBJECTIVES
Oral ingestion of nucleic acids exhibits various biological functions, but those in the brain are largely unknown. We have recently reported that the ingestion of DNA hydrolysate derived from salmon milt showed cognitive enhancement in normal mice, while the effect of ingestion of RNA on cognitive function remains unclear. The purpose of the present study was to elucidate the effect of torula yeast-derived RNA (tyRNA), which contains ~70% of RNA consisting of 20-200 bases of oligoribonucleotides, on learning and memory, and its underlying mechanisms in normal mice.

METHODS
Seven-week-old ICR mice were fed a low-nucleic acid diet (AIN-93M) and that containing 2.5% tyRNA. Fourteen days later, the spatial recognition test (SRT) was performed to evaluate cognitive function. The brain concentration of various nucleic acids-derived components was comprehensively measured after 17 days of the tyRNA feeding by LC-MS/MS. The effect of certain nucleic acids-derived components on the expression of synapsin 1 (Syn1), a presynaptic marker was evaluated in primary cultured mouse cortical neurons (PCNs) by Western blotting. Since certain nucleosides including uridine and cytidine contribute to the synthesis of phosphatidylcholine (PC), which is a component of the neuronal membranes, via the Kennedy pathway, and the synthesis of brain PC may promote neurite outgrowth, the targeted lipidomics using LC-MS/MS was performed in the PCNs incubated with uridine, cytidine, deoxycytidine (dC), and tyRNA and the brain samples obtained after 4 weeks of the tyRNA feeding.

RESULTS
In SRT, the discrimination index, an indicator of learning and memory, in tyRNA group was significantly higher than control diet group. In the brain after the tyRNA feeding, concentrations of uridine, cytidine, dC, UMP, and dCMP were significantly higher than control group. Among those five nucleic acids-derived components, incubation with only cytidine significantly increased protein expression of Syn1 in PCNs, suggesting that cytidine may promote synaptogenesis. Also, in cytidine and tyRNA group, peak intensities of PCs were significantly higher than in vehicle group in PCNs. Moreover, certain PCs level in the brain in tyRNA group was significantly higher than the control group, suggesting that tyRNA may increase PC synthesis in the neurons possibly via the Kennedy pathway.

CONCLUSIONS
Taken together, ingestion of tyRNA may increase nucleic acids-related metabolites in the brain and improve cognitive function by the increase in PCs in normal mice.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_092

UTILIZATION AND ACCEPTABILITY OF ALTERNATIVE MEAT PRODUCTS: FOCUSING ON FEMALE UNIVERSITY STUDENTS

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BACKGROUND AND OBJECTIVES
Global issues such as food shortages and climate change become more serious. Since consumers' perception on sustainable food supply is increasing, alternative protein products are attracting attention. However, there are educational and generational differences in awareness and willingness to purchase alternative meat products. This study aimed to examine how plant-based meat is accepted among the young female generation in Japan.

METHODS
We conducted a questionnaire survey about plant-based meat utilization and acceptability, particularly focusing on female university students. One hundred with aged of 10s-60s including eighty-five female university students participated. The questionnaire covered topics such as awareness of plant-based meat substitutes, image, eating experience, reasons for choosing or not choosing, and so on.

RESULTS
Awareness of plant-based food as alternative meat was generally high (about 80% of respondents). However, only 50% had actually tried them. The reasons given for choosing plant-based meat substitutes were positive factors such as health consciousness and low environmental burden. With regards to negative attitudes, the most common negative response was 'they don't taste good'. By age, young university students were more interested in trying it out, but middle-aged and older people were more concerned about reproducible quality of taste and texture of conventional meat. Even among those who were highly conscious of environmental issues, the high price was a major barrier to their choosing plant-based meat.

CONCLUSIONS
This study revealed that female university students had highly health conscious about plant-based meat. While, many participants answered that they wouldn't choose plant-based meat because it didn't look tasty. The RESULTS provide that the most meat-like taste and the added value of healthier eating significantly impact on acceptance of plant-based meat in Japanese young female consumers. Given the importance of promoting sustainable future for food, it is important to emphasize the benefit for a global food shortage and update new knowledge based on scientific and social research in dissemination raising among young generation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_093

PREBIOTIC GALACTOOLIGOSACCHARIDES AND THEIR PERSPECTIVE ROLE AGAINST COLON CANCER PREVENTION

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BACKGROUND AND OBJECTIVES
Colon cancer is the third leading reason of cancer-related deaths in whole world and is fourth most common cancer type. In the present study the role of galacto-oligosaccharides (GOS) was evaluated against projection of colon cancer.

METHODS
Rats were randomly divided into six groups (9 rats in each group), one positive control group (G0), one negative control group (G1), three treatment groups (G2, G3, G4) and one control group (G5). Research was carried out in two phases, production of prebiotic galacto-oligosaccharide and assessment of their protective role against colon cancer.

RESULTS
Animals belonging to prebiotic galactooligosaccharides groups (G2, G3 and G4) and inulin (Go) had significantly decreased aberrant crypt foci (ACF) counts per colon as compared to controlled animals (G1 and G5). The body mass of animals belonging to galacto-oligosaccharides(Group G2, G3 and G4) increased significantly higher as compared to control group (G1).

CONCLUSIONS
Effect of pre-biotic treatment had significant effects on organ weights; liver, heart, spleen as well as small intestine length. It was concluded in our findings that galacto-oligosaccharides (GOS) were defensive against colon cancer. However further research is needed at molecular level to find out the transformations at gene levels.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_094

RESEARCH ON THE FLAVOR COMPONENTS AND ANTIOXIDANT PROPERTIES OF GRILLED EDAMAME

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BACKGROUND AND OBJECTIVES
Vegetable soybeans, also known as edamame, are renowned for their abundant nutrients and favorable sensory characteristics. They are gaining popularity as a plant-based meat on a global scale. A significant quantity of edamame is cultivated and consumed in Niigata, Japan. Kurosaki chamame is the most renowned and branded edamame, and it was the first edamame to be registered under the Geographical Indication (GI) protection system. While edamame is typically consumed in its boiled state, the focus of this study was exploring alternative cooking methods. The objective of this study was to evaluate the flavor components and antioxidant properties of grilled edamame.

METHODS
The Kurosaki chamame harvested in September 2024 were used on the day of harvest. Two hundred grams of edamame, with or without salt, were wrapped in aluminum foil and placed on a wire net. The aluminum foil-covered edamame was then placed over an open flame and grilled for 10 minutes. For the purposes of comparison, edamame, with or without salt, were boiled in water. After cooling, the samples were subjected to the measurement of color, moisture, total sugar, free amino acid, total polyphenol content, and antioxidant activity. The taste was evaluated using a taste sensor.

RESULTS
The findings of the study indicated that the color of grilled edamame exhibited lower L* and b* values, and higher a* value in comparison to boiled edamame. The moisture content of grilled edamame was found to be lower than that of boiled edamame. However, no significant differences in total sugar, total polyphenol content, or antioxidant activity were observed between grilled edamame and boiled edamame. The investigation further revealed that the addition of salt did not affect these parameters of grilled edamame. The major free amino acids detected in the edamame samples included asparagine, glutamic acid, and alanine, with arginine, histidine, and GABA were also present in relatively high concentrations. The total amino acid level in grilled edamame was found to be approximately twice as high as that of boiled edamame. Furthermore, the RESULTS of the taste sensor evaluation indicated that grilled edamame exhibited a rich umami taste, with salt enhancing the aftertaste umami, particularly in grilled edamame.

CONCLUSIONS
It was suggested that the increase in amino acid content was responsible for the enhanced umami taste observed in grilled edamame. The study concluded that grill is an effective cooking method for improving the edamame's flavor profile.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_097

NUTRITION LABELING AND CONSUMER PERCEPTION ANALYSIS OF FOOD PRODUCTS

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BACKGROUND AND OBJECTIVES

The World Health Organization (WHO) has promoted Front Of Pack (FOP) labels to guide consumer choices, but the lack of global regulation has sparked debates about the best system. In Europe, discussions focus on two options: Nutri-Score (NS) and NutrInform Battery (NIB). We conducted a study to identify which FOP better communicates food nutritional quality. Additionally, given the Mediterranean Diet's (MD) link to reduced cardiovascular risk, we evaluated whether MD adherence influences FOP understanding and consumer choices.

METHODS

Six food products were evaluated: low-fat yogurt, white whole yogurt, stracciatella yogurt, and jams of apricots, blueberries, and plums. For each product, an image was presented, accompanied by the two different FOP labels. Participants rated each product on a 7-point Likert scale for its buyability ("would not buy at all" to "sure I would buy"), healthiness ("not healthy" to "healthy"), and nutritional value ("not at all" to "extremely"). Adherence to the MD was assessed using the Medi-Lite questionnaire.

RESULTS

The sample consisted of 457 participants aged 18-77 years (mean age: 38.9±14.8), with 70.9% being women. Preliminary RESULTS revealed that 44.8% of participants were responsible for household food purchases, though only 37.8% reported paying attention to nutrition labels. Additionally, 68.2% of the participants were adherent to the MD. Regarding the NS system, low-fat yogurt was rated the most purchasable (4.95±1.96) and healthy (5.60±1.53), while white yogurt was considered the most nutritious (5.00±1.36). Among jams, apricot jam was rated as the most purchasable (4.70±1.95), healthiest (4.97±1.63), and most nutritious (4.62±1.62). For the NIB system, the yogurt RESULTS were consistent, albeit with slightly different scores for purchasability (4.74±1.96), healthiness (5.29±1.58), and nutritional value (4.86±1.44). For jams, the RESULTS mirrored those of the NS system, indeed apricot jam was rated as the most purchasable (4.55±1.96), healthiest (4.86±1.58), and most nutritious (4.19±1.61). Statistical analysis indicated no significant difference in nutrition label comprehension between MD adherents and non-adherents.

CONCLUSIONS

According to the preliminary RESULTS, despite slight differences, the two FOP labeling systems NS and NIB are comparable in terms of the three parameters considered (purchasability, healthiness, and nutritional value). Furthermore, adherence to the MD does not appear to influence consumer choices.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_098

VALIDATION OF STRUCTURE OF HOME COOKING SKILLS QUESTIONNAIRE: AN ITALIAN VERSION (HCSQ-ITA)

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BACKGROUND AND OBJECTIVES

The Mediterranean Diet, widely recognized for its association with a lower risk of chronic non-communicable diseases, is experiencing a decline in adherence within Italy. This nutritional transition is partly attributed to a loss of culinary skills, including the ability to select, combine, and prepare foods using traditional culinary techniques for home-cooked meals. The increasing access to ready-to-use foods contributes to higher calorie intake and reduced consumption of vegetables, fruits, and whole grains. Nutrition professionals (NP) play a crucial role in addressing this issue by promoting food and nutritional education initiatives aimed at improving eating habits. To assess the culinary skills of NP, the "Primary Health Care Home Cooking Skills Scale" was developed and validated in Brazil. This study aims to validate the scale's Italian version.

METHODS

For the validation of the structure, the original Brazilian questionnaire underwent several stages, including translation, cultural adaptation, synthesis, and reverse translation into Italian. A panel of nutrition experts (n=10) reviewed the translated version electronically using the Delphi technique, with rounds continuing until consensus was reached on the clarity and relevance of each question. A pilot test was conducted with a sample of 30 students and NP, who completed the questionnaire twice at a 15-day interval to evaluate its reproducibility. A minimum Content Validity Index (CVI) value of 0.9 was established as the threshold for agreement for all items. The Pearson coefficient was calculated for reproducibility analysis.

RESULTS

After translation and cultural adaptation, the pilot application of the HCSQ-ITA to the sample suggested modifications to include the vegetarian group. The final version of the HCSQ-ITA consists of 28 questions with Likert scale options to assess the frequency that best represents the respondent's routine (never = 0 points, nearly never = 1, sometimes = 2, almost always = 3, always = 4). The total score is calculated as a sum, categorized as follows: ≤28 (low home culinary skills), 29–56 (moderately low), 57–84 (moderately high), and ≥85 (high). By the end of the second Delphi round, the Content Validity Index (CVI) exceeded 0.9 for all items, and the Pearson coefficient for reproducibility analysis was 0.87.

CONCLUSIONS

The structure of the Italian version is considered adequate. Future analyses will be conducted in a larger sample to assess the internal consistency of the questionnaire through factorial analysis.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_101

THE COMPARATIVE STUDY OF PHENOLIC COMPOUND OF THE ARTICHOKE (CYNARA SCOLYMUS L.), ACCLIMATIZED IN MONGOLIA

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BACKGROUND AND OBJECTIVES
The artichoke, ancient plant leaves are used as an herbal medicine and have been recognized since ancient times for their beneficial and therapeutic effects, including promotion of blood circulation, mobilization of energy reserves, induction of choleresis, inhibition of cholesterol biosynthesis and low-density lipoprotein oxidation and significant antibacterial, antifungal and antioxidant as well as strong hepato protective effects. This study evaluates the amount of phenolic compound of the Artichoke which has been acclimatized in Mongolia.

METHODS
: We selected the Artichoke dried leaves and three kind of artichoke drink from the market. The artichoke leaf sample which grown in the typical major area for the cultivation in Selenge prefecture located in north side of Mongolia. Qualitative analyses of polyphenols were carried out using a series LC-20A HPLC system equipped with a system controller, two chromatographic pumps, degasser, an autosampler with a 100 μL sample loop, a UV detector, a column oven and an MS detector with an ESI source (Shimadzu, Japan).

RESULTS
The Artichoke (*Cynara scolymus L.*) which has been acclimatized in Mongolia is major source of phenolic compound as cynarin, chlorogenic acid. In particular, dried artichoke leaves contain chlorogenic acid 5228.3 μg/g and total cynarin (1,3 and 1,4–di-0-caffeoylquinic acid) 4160.8 μg/g, which are phenolic compounds that are beneficial to health. The caffeic acid not detected. The amount of apigenin (7-0-rutinoside) was 97.25 μg/g.

CONCLUSIONS
The comparison of phenolic compound of artichokes acclimatized in Mongolia is with other related research RESULTS, the chlorogenic acid content being similar, but cynarine content being higher.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_102

FOOD SUPPLEMENT SAFETY: INSIGHTS FROM RASFF DATA ON ADULTERATION AND OVERDOSAGE

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BACKGROUND AND OBJECTIVES
The increasing popularity and accessibility of food supplements (FS) has been accompanied by growing health risks. A significant concern is the adulteration of FS with unauthorized synthetic pharmaceuticals, as some manufacturers prioritize consumer wishes (market demands) over safety. Even vitamins and minerals can pose a health risk for supplements consumers when present in excessive levels. This study aimed to provide insights in unauthorized presence of prescription drugs and excessive doses of vitamins and minerals in FS, based on the European Union Rapid Alert System for Feed and Food (RASFF) data.

METHODS
Notifications related to the food category "dietetic food, food supplements, fortified foods" and the hazard categories "composition" and "novel food" (year 2022-2024) were taken from the RASFF portal. Data on FS adulteration with prescription drugs and non-compliance with vitamin and mineral regulations were manually extracted and assessed.

RESULTS
The RASFF records revealed 89 notifications involving prescription drugs, with the most commonly identified adulterants in FS being: phosphodiesterase-5 inhibitors (PDE-5; 64 notifications), including sildenafil, tadalafil, vardenafil, and their synthetic analogues; anorexics (8), such as sibutramine; stimulants, including natural phenethylamines (synephrine; 4 notifications) and synthetic stimulants (notably 1,3-dimethylamylamine (DMAA) and 1,3-dimethylbutylamine (nor-DMAA); 4 notifications in total); anabolic agents (2); other drugs (8) and cannabinoid cannabidiol (CBD), pending authorization as a novel food ingredient (19). Notably, many FS contained multiple unauthorized prescription drugs simultaneously, highlighting their regulatory non-compliance. Additionally, 22 notifications were related to vitamin and mineral composition non-compliance, including excessive intake or overdosage (16 notifications). Violations predominantly involved vitamins (76.5%), with the most frequent being vitamin D (5 cases) and vitamin B6 (4), while mineral-related violations (4 cases) included zinc and iodine. Overall, 64.9% of a total of 111 notifications were classified as a serious risk, with 66.7% issued as alerts. Products originating from Turkey accounted for the highest proportion of hazardous FS (15.3%), particularly those adulterated with PDE-5 inhibitors (70.6%).

CONCLUSIONS
To mitigate health risks and ensure FS safety, advanced analytical methods, stricter regulatory frameworks, improved quality control, and multidisciplinary collaboration are essential.

CONFLICTS OF INTERESTS
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EPO3_103

UNDERSTANDING CONSUMER ACCEPTANCE OF CALCIUM-FORTIFIED JUICES AND NOVEL FOODS WHILE PROMOTING IMPROVED NUTRITION AND SUSTAINABLE DIETS

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BACKGROUND AND OBJECTIVES
The growing demand for sustainable diets and improved nutrition has sparked innovation in the food supply chain, including eggshell calcium for fortifying fruit juices.

METHODS
The Web of Science and Scopus databases were used to screen articles published between 2013 and 2023 using the predetermined query, resulting in 129 articles.

RESULTS
This approach offers a more sustainable and efficient option for enhancing dietary calcium intake and reducing waste while providing a convenient and accessible solution for individuals who are lactose intolerant or prefer plant-based diets. Calcium-enriched juice concentrates and ready-to-drink 'shots' cater to diverse consumer preferences, ensuring ease of integration into daily diets. This approach, alongside developing fortified foods like cereals and snack bars, aims to improve calcium intake and bone health globally. Complementary strategies include promoting calcium-rich foods, educational campaigns on eggshell calcium benefits, nanotechnology advancements, and partnerships with food manufacturers to improve accessibility and affordability of calcium-fortified products. However, the acceptance of such innovations remains a challenge. Behavioral factors, including personality traits and social context, play a crucial role in consumer responses to novel foods. These factors have been less studied than sensory aspects. Perceiving dietary changes as a loss, along with resistance to unfamiliar foods, can hinder the adoption of products like eggshell calcium-fortified juices. Consumers may face challenges in purchasing and consuming these juices due to concerns about taste, price, the effectiveness of eggshell calcium, and the presence of added ingredients, despite its more sustainable and resource-efficient benefits. Additionally, lack of awareness, dietary preferences, packaging convenience, and sustainability considerations can further impact their acceptance of these products. Strategies like framing, pro-diversity labeling, and highlighting the biodiversity and health benefits of eggshell calcium-fortified products could help overcome these barriers, making consumers more receptive to these sustainable and nutritious options.

CONCLUSIONS
The success of calcium-enriched juices and novel foods depends on aligning product development with consumer expectations and addressing behavioral barriers to foster greater acceptance. By prioritizing these factors, the food industry can better support the transition toward sustainable diets while meeting consumer needs for improved nutrition and health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_104

VIABILITY AND ANTIOXIDANT POTENTIAL OF LACTICASEIBACILLUS CASEI IN BLUEBERRY JUICE FORMULATIONS

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BACKGROUND AND OBJECTIVES

In the last decade, there has been an expansion and consumption of foods with functional properties, using ingredients such as dietary fiber, probiotics, prebiotics, and polyphenols due to their beneficial health properties. Therefore, a growing interest is developing functional beverages from fruit and vegetable juices. This research aims to evaluate the viability of *Lacticaseibacillus casei* in blueberry juice and its physicochemical characteristics.

METHODS

Four formulations were prepared: sucrose solution with probiotic (SP), sucrose and gallic acid solution with probiotic (SGAP), blueberry juice with probiotic (BP), and blueberry juice adjusting the pH (BpH); and fifth, a control sample of blueberry juice (B); samples were stored at 4 °C for 28 days. Viable counts of *L. casei* were determined during storage at 4 °C during day 0 (just after homogenization), 3, 5, 7, 14, 21, 28. An aliquot of 1 mL of each sample was diluted (10-1-10-6) using a saline solution and a micro drop inoculation technique for 48 h at 37 °C.

RESULTS

L. casei viability decreased over time, mainly in SGAP samples; however, SP and BJP samples performed better throughout the storage period. This indicated that sucrose solution and fruit juice conditions were more suitable for maintaining the probiotics' viability. Antioxidant capacity was determined using FRAP and DPPH methods during storage at 4°C for 28 days (about 4 weeks). RESULTS exhibited that SGAP samples had better antioxidant capacity than juice samples during storage, possibly due to gallic acid's bactericidal effect. As for the juice samples, the BJ samples showed a more significant loss of antioxidant capacity from day 7 to 14, which was more pronounced in the FRAP method; regarding the BJP samples, the behavior was like the BJ samples.

CONCLUSIONS

The pH is a detrimental factor in the viability of L. *casei* since, after day 7, the viability decreases notably under refrigerated conditions. The prebiotic effect of polyphenols also affects the anthocyanins since they are used as a substrate, which is reflected in the loss of anthocyanins in the sample of blueberry juice containing *L. casei*.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_106

SODIUM IN DIFFERENT PROCESSED SOUPS IN 2013

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BACKGROUND AND OBJECTIVES

Excessive sodium (Na) consumption can lead to hypertension, Cardiovascular Diseases (CVD) and renal disease. In Ecuador, CVD is a leading causes of death in adults. Objective: To determine sodium content according on package in processed soups.

METHODS

In 2013, twenty-two processed soups sold in supermarket in Quito – Ecuador were collected. The Na content was collected from Nutrition Facts label on package. Soups were divided in the following categories: creams, soups, Ecuadorian Commercial Brands (ECB), Supermarket Private Brands (SPB), and International Commercial Brand (ICB). Statistical analysis: the data were analyzed for the different processed soups categories for mean sodium content comparison using paired T test using statistical software SPSS 12.0.

RESULTS

The mean sodium and salt content was higher in ICB than ECB and SPB. ICB had 43,75% (277,65 mg/100g) more Na content than ECB and 45,91% (291.37 mg/100g) more sodium content than SPB. In addition, ICB had more salt content 44,03% (0,69 mg/100g) that ECB, and 45,91% (0,72g/100g) more salt content that SPB. Also, creams had more salt content 89% (49,14mg/100g) than soups.

Table 1. The mean sodium content (mg/100g) and mean salt (g/100g) from International Commercial Brand (ICB), Ecuadorian Commercial Brands (ECB) and Supermarket Private Brands (SPB) in 2013

Brands	**Mean sodium (mg/100g) ± DE**			**Mean salt (g/100g) ± DE**		
ICB	634,70	±	124,97	1,59	±	0,31
ECB	357,05	±	45,70	0,89	±	0,11
SPB	343,33	±	52,41	0,86	±	0,13
Total	429,03	±	148,05	1,07	±	0,37

CONCLUSIONS

Ecuadorian government play a key role in implementing food policies and regulations for the food industry to regulate sodium. As well as, it is important to implement food reformulation policies aimed at reducing the risk of diet-related non-communicable diseases such as CVD. Finally, educating the population about nutritional labeling and the risks of excess sodium consumption is crucial.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_107

FATTY ACID COMPOSITION AND LIPID HEALTH INDICES OF GLUTEN FREE CEREAL FOOD

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BACKGROUND AND OBJECTIVES
Until recently, there was a scarcity of gluten free food on the market. However, raised awareness of its nutritional importance for people with gluten intolerance/celiac disease, resulted with great increase of variability and availability of such foods. Produced from cereals with low gluten content such as corn, rice, buckwheat and millet, as opposed to wheat, barley, rye and oat, gluten free foods differ in their composition from common foods, including lipid profiles. The study addresses fat content, fatty acid (FA) composition and corresponding lipid quality indices of gluten free food, reflecting its health profile.

METHODS
Fat content of 62 prepacked 'gluten free' cereal foods (flour, bread, breakfast cereals, pasta, biscuits and snacks) collected on the Serbian market was determined using Soxhlet method. Extracted fat was further subjected to GC-FID profiling of 37 FA. FA composition was used for grouping of characteristic FAs, i.e., saturated (SFA), mono- (MUFA) and poly-unsaturated (PUFA), omega-3 (ω-3-FA) and omega-6 (ω-6-FA) as well as for calculation of atherogenicity (IA) and thrombogenicity (IT) indices, and hypo-/hyper-cholesterolemic (HH) and ω-6/ω-3 ratios.

RESULTS
The mean fat content (%) of food groups was as follows: bread 6.1±2.5, breakfast cereals 5.7±2.8, flour 1.6±1.2, pasta 3.5±5.3, snack 11.0±9.5, of which SFA contributed from 1.5±1.1 in bread to 2.8±2.3 in breakfast cereals, MUFA from 1.3±0.9 in breakfast cereals to 5.0±4.3 in snacks and PUFA from 1.3±0.9 in breakfast cereals to 0.8±0.8 in flours. ω-3-FAs, represented by ALA, without EPA and DHA presence, were the highest in bread group (0.5%), while ω-6-FAs reached maximum share of fat in snack group (2.4%). With regard to lipid quality indices, in case of IA and IT, the group mean values were in the same order: pasta (0.3±0.1 and 0.6±0.3) < bread ≈ snack < flour < breakfast cereals (2.8±4.4 and 1.9±2.2). According to the mean HH ratio, food groups were positioned in a little bit different order: bread (7.8±5.5) > snack > pasta > flour > breakfast cereals (3.2±1.9), while ω-6/ω-3 ratio caused major disturbances: breakfast cereals (13.5±4.2) < bread < snack < pasta < flour (32.0±5.4).

CONCLUSIONS
Taking into account all considered lipid quality indices together, gluten free pasta and bread show more favorable characteristics in comparison with snack, flour and especially breafast cereals. However, differences in the amount of foods consumed significantly affect dietary FA intake amounts and consequent health effects.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_108

FAT AND FATTY ACID INTAKE FROM GLUTEN FREE CEREAL FOOD

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BACKGROUND AND OBJECTIVES
A variety of gluten free foods, nutritional therapy for people with gluten intolerance/celiac disease, is increasingly available on the market. Gluten free cereal foods are produced from corn, rice, buckwheat and millet, as substitutes for gluten-rich cereals such as wheat, barley, rye and oat. As it is known that difference in cereal source causes difference in fat content and composition, the current study assess fat and essential fatty acid (FA) (linoleic acid, LA; alpha-linolenic acid, ALA) intake from cereal food in people on gluten free diet.

METHODS
A total of 62 prepacked cereal foods labelled as 'gluten free' (8 bread, 4 breakfast cereal, 12 flour, 15 pasta, 23 snacks) was collected on the Serbian market. FA composition was determined in extracted fat (Soxhlet method), using GC-FID. Amounts of essential FAs were combined with national chronic food consumption data and resulting dietary intake estimates were evaluated in relation to the dietary reference values (DRVs), expressed based on energy (E) intake: total fat (35-40)% (toddlers) and (20-35)% (all other population groups), LA 4% and ALA 0.5%.

RESULTS
Taken all groups of cereal food together, in case of toddlers mean contribution of total fat to E requirements was (22-26)% for males and (24-27%) for females. Regarding other age groups, the contribution levels ranged from (16-28)% to (20-35)% in case of males, and from (19-33)% to (22-40)% in case of females, with the lowest levels recorded for adolescents of both sexes and the highest for other children-males and elderly-females. Regarding specific populations, pregnant women obtain (18-31)% of their E requirements through fat intake, while vegetarians reach (22-39)% and (28-48)%, for males and females, respectively. According to the contribution to the intake of essential FAs, the order of age groups (males/females) was: toddlers (60/64% LA, 85/91% ALA) > other children > elderly > adults > adolescents (38/44% LA, 56/65% ALA). For pregnant women, the intake of LA and ALA reached 42 and 61%, respectively, while vegetarians again positioned very high, with 52/64% of LA and 69/85% of ALA provided from gluten free cereal food. For all population groups, bread was the richest source of fat, LA and ALA intake.

CONCLUSIONS
The consumption of cereal food provides fats supplying from around one quarter to around one third of E requirements, depending on the age and sex of population on gluten free diet, with somewhat higher levels in case of vegetarians. For a comprehensive evaluation of fat and essential FAs intake, other dietary sources of lipids need to be taken into account.

CONFLICTS OF INTERESTS
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EPO3_109

MINERAL COMPOSITION OF GLUTEN FREE CEREAL FOOD

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BACKGROUND AND OBJECTIVES
Individuals with gluten intolerance/celiac disease must avoid cereals which are rich sources of gluten such as wheat, barley, rye and oat, and products thereof. The substitutes used for production of gluten free foods are corn, rice, buckwheat and millet, which can be significant dietary source of essential minerals. The objective of the current study was to explore the mineral composition of gluten free cereal food, which is essential for the assessment of its nutritional value in terms of capacity to fulfil dietary reference requirements.

METHODS
A total of 88 samples, including flour, bread, breakfast cereals, pasta, biscuits, snacks and cereal bars, all marked with 'gluten free' wording and/or a crossed grain symbol, was obtained on the Serbian market. Mineral content was determined in samples prepared using microwave digestion, by inductively coupled plasma coupled with either optical emission (ICP-OES) (Na, K, Ca, Mg) or mass spectrometry (ICP-MS) (Mn, Fe, Cu, Zn, Se, Mo).

RESULTS
The mean macroelement contents (mg/kg) of food groups were ordered as follows: Ca - cereal bars (1122±1076) >> biscuits > snacks > breakfast cereals ≈ pasta > bread > flour (80±57); Mg – cereal bars (903±506) > breakfast cereals ≈ snacks > pasta > bread > biscuits > flour (376±425); K – snacks (6772±13397) ≈ cereal bars > pasta > breakfast cereals > biscuits > bread > flour (1688±1157). Although Na is an essential mineral, lower content is preferable: pasta (252±462) << flour < cereal bar < biscuits < bread ≈ snacks (10882±8615). With regard to microelements, the food group mean contents (mg/kg) ranged as follows: Fe – from 2.2±1.0 to 46±22, Zn from 3.1±3.2 to 17±7.6, Cu from 6.2±3.7 to 0.6±0.4, in all cases with the lowest level recorded in breakfast cereals and the highest in cereal bars; Mn content reached maximum in snacks (8.8±9.0), Mo in cereal bar (0.43±0.27) and Se in pasta (0.13±0.25).

CONCLUSIONS
Knowing the mineral composition of food makes it possible to make informed food choices and combine various food groups in the most favorable way. Furthermore, it allows for the assessment of population dietary intake of these important nutrients. In case of food intended for population groups with limited food choices, such as individuals obliged to adhere to a gluten free diet, this becomes especially important.

CONFLICTS OF INTERESTS
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EPO3_110

INTAKE OF MINERALS FROM GLUTEN FREE CEREAL FOOD

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BACKGROUND AND OBJECTIVES
Gluten free foods, intended for people with gluten intolerance/celiac disease, are increasingly present on the market. Such food is considered nutritional therapy, making it possible to avoid gluten-rich cereals (wheat, barley, rye and oat) by their substitution with corn, rice, buckwheat and millet. These cereals and products thereof thus become important dietary sources of essential minerals. The current study assesses the intake of minerals from cereal food in people on gluten free diet.

METHODS
Sample collection comprised 88 prepacked cereal foods with 'gluten free' labelling (12 flour, 10 bread, 15 pasta, 16 biscuits, 26 snacks, 4 breakfast cereals, 5 bars), purchased on the market of Serbia. Content of minerals, determined using ICP-OES and ICP-MS, was combined with national chronic food consumption data and resulting mineral intakes were evaluated in relation to the dietary reference values (DRVs).

RESULTS
Taken all groups of cereal food together, mean contribution to mineral DRV (Average Range (AR) or Adequate Intake (AI), what applicable) within one age group descended in the following order (%, males/females, where applicable, or age classes, when applicable): toddlers – Mo (400) > Mn > Na > K > Se (94) > Mg > Cu > Fe > Zn > Ca (18); other children – Mo (296) > Na > Mn > Mg (68) > K > Se > Cu > Zn > Fe > Ca (12); adolescents – Mo (182) > Na > Mg (67/80) > Cu > Fe > K > Mn > Se > Zn > Ca (11); adults – Mo (163) > Fe (74/64) > Mg > Na > Mn > Cu > Zn > K > Se > Ca (13/15); elderly – Mo (144) > Mg > Na (65) > Fe > Mn > Cu > Zn > K > Se > Ca (14). With regard to specific population groups, the order of intake of minerals by pregnant women was as follows: Mo (150) > Mg and Na (66) > Fe and Mn > Cu > Zn > K > Se > Ca (12/14), while in case of vegetarians, it was Mo (224) > Mg (85/99) > Na > Cu > Zn > K > Fe > Mn > Se > Ca (19/22). It is easily observable that all orders begin with Mo, the only element with intake exceeding 100% of DRV for all population groups, and ends with Ca, fulfiling from 11% of DRV for adolescents to 18% for toddlers. For all population groups, bread and breakfast cereals were the richest sources of minerals, in latter case with exception of Fe, Cu and Zn.

CONCLUSIONS
The study underscores the importance of monitoring the intake of essential nutrients, especially in case of population with restricted food choice due to specific health conditions. High-quality and safe gluten free food making it possible to reach DRVs should be the ultimate goal of all interested parties - producers, public health authorities and consumers.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_112

COMPARATIVE STUDY OF TRADITIONAL AND VACUUM PROCESSING OF MONGOLIAN DAIRY “EEZGII"

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BACKGROUND AND OBJECTIVES

Mongolians have a wealth of experience and methods of making dairy products adapted to the climate and home conditions of their homeland, and have been using milk to make many types of puddings unknown to many regions of the world. One of them is the owner. “Eezgii” is a very unique food that is spread only among the Mongolian people. All the components of milk are gathered together and the water is evaporated immediately. By combining the traditional methods of processing “eezgii” with modern advanced technology, we can not only meet our own demands and needs, but also take a leading position in the world with our precious products with unique taste and characteristics.

METHODS

“Eezgii” is usually made in spring and autumn, and freshly milked milk is heated until it rises, fermented whey, fermented milk, and yogurt are added to it, and then the eedima is gently boiled in whey. Importance of food and nutrition. “Eezgii” is a very nutritious food and can be used to treat chronic liver and biliary diseases. The composition of Eezig contains a certain amount of biologically active substances such as lactulose, lactulosolin, calcium lactate, which are of special importance to the human body.

RESULTS

The drying process was carried out by vacuum and traditional methods. 500 ml of cow's milk with 6.4% fat, 3.87% protein and 84.08% moisture was used in the experiment. Heat the milk to 81oC, add yogurt equal to 10% of it, stir it gently (about 11 minutes for edum formation), separate the edum from the yellow milk and divide it into two equal parts.

Boiling started at 60oC in the vacuum apparatus, and drying was carried out at a constant temperature of 65oC. The sweep lasted a total of 25 minutes.

When the whey was dried by the traditional method, boiling started at 88oC, and when drying was carried out at a constant temperature of 93oC, the whey was completely dried in about 33 minutes.

CONCLUSIONS

From this, it can be seen that the drying and processing of rind in a vacuum device is more beneficial in terms of time and productivity than the traditional method.

It can be seen from the oil and protein content and the unsaturated acid ratio of the oil that the temperature at which the rice is dried in the vacuum device is 65oC.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_115

EFFECT ON THE ANTIOXIDANT PROPERTIES AND PALATABILITY OF DIFFERENT EXTRACTION OF LINDERA PRAECOX LEAF TEA

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BACKGROUND AND OBJECTIVES
The former firewood and coal forests owned by Japanese mountain communities in areas with heavy snowfall grow abundant hardwood trees. The concept of sustainable forest management is addressed within the framework of the Sustainable Development Goals (SDGs). In light of the necessity to utilize local resources in a sustainable manner, the focus of our research is on the health benefits of hardwood tree leaves. These leaves are rich in polyphenols and possess antioxidant properties. In the previous study, the leaves of *Lindera praecox* (Lp) were founded to have the highest polyphenol content and antioxidant activity among 20 kinds of leaves. The objective of this study was to examine the preparation method for a tea made with Lp leaves that is both high in health functionality and palatability.

METHODS
The leaves of Lp were collected in Tadami-machi, Fukushima Prefecture, Japan. The dried leaves were extracted with hot water for 3 or 10 min (hot-water extract tea). A boiling-water extract tea was also prepared by extracting the dried leaves while heating for 3 or 10 min. The total phenol and catechin contents, antioxidant activity, color, and sensory attributes of hot-water and boiling-water extract tea were determined.

RESULTS
The boiling-water extract tea of Lp leaves exhibited significantly higher total phenol content and antioxidant activity compared to the hot-water extract tea. However, differences in extraction time were only significant for total polyphenols, which were higher at 10 min than at 3 min. The presence of gallic acid and catechin was detected in both hot-water and boiling-water extract tea. Epicatechin gallate was found in only boiling-water extract tea, and the highest content of total catechin was observed in boiling-water extract tea of 10min heating. The color of boiling-water extract tea exhibited lower L* values, and higher a*, b*, and chrome values in comparison to hot-water extract tea. Boiling-water extract tea of 3 min was preferred at sensory evaluation with good smell and bitterness compared to hot-water extract tea of 3 min. However, boiling-water extract tea of 10 min was not preferred with strong bitterness compared to boiling-water extract tea of 3 min.

CONCLUSIONS
These RESULTS indicate that boiling-water extraction with heating is a superior tea preparation method that elicits higher antioxidant properties. It was observed that an increase in heating time resulted in a corresponding increase in health benefits; however, the optimal duration for palatability was found to be shorter heating times.

CONFLICTS OF INTERESTS
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EPO3_118

PREPARATION OF FERMENTED SOY BEVERAGE WITH ACEROLA JAM AND USE OF OKARA IN GLUTEN FREE DESSERT MIX TO REDUCE WASTE AND ADD NUTRITIONAL VALUE

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BACKGROUND AND OBJECTIVES

Soybeans were chosen as raw material for their nutritional properties and low cost, to create an affordable yogurt-like product of high nutritional quality due its probiotic, antioxidant and protein content. The acerola was added to enhance flavor of the beverage and add antioxidants. Acerola is a tropical fruit that is not widely comercialized.
Okara is obtained as a soy by-product, which is often wasted. Okara is a potential source of fiber and protein. Therefore, it was used in the development and fortification of a gluten-free brownie flour.

METHODS

The fermented soy yogurt-type product was prepared by making the soy beverage and fermenting it with sugar and probiotics capsules. The acerola jam was formulated from frozen acerola, with the addition of cane sugar and pectin. The okara was dehydrated and ground. The properties of the products were measured using a vibrational viscometer, Kjeldahl methods, titratable acidity, Bligh Dyer, total polyphenols and DPPH. Sensory analysis was also performed for the okara gluten free dessert mix.

RESULTS

The soy ferment has a viscosity of 300.83 mPa·s at 20°C, and 79.90 mPa·s for the ferment with acerola. Proteint content was 6.11±0.56% for soy ferment and 3.95±0.98% with the acerola jam added. Lipids were 3.06±0.00% for soy ferment. Total solids for the soybean ferment were 1.51°Brix and 5.03°Brix for the acerola ferment. When testing the antioxidant capacity of acerola jam, it was determined that the inhibition of the DPPH reagent was 92.3%. Adding jam to the product can contribute to its antioxidant capacity since the DPPH inhibition of soy yogurt was 14.9%. Okara resulted in 25.4±1.41% of protein, which contributed to the protein of the GF mix (6.25±6.09%).

CONCLUSIONS

The yogurt-like product provides a protein content of approximately 6.11%. The fat content was 3.06%. These values are comparable with similar products of animal origin. The addition of acerola jam reduces the protein content of the final product, since jam mainly provides carbohydrates. However, it does significantly provide antioxidant compounds, improving the nutritional quality of the product.
From a compositional perspective, okara increased protein content by 58.88%, thus suggesting a significant potential source of plant protein. Additionally, the use of okara reduced the waste of the soy ferment production to almost zero.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_120

A SCOPING REVIEW OF STUDIES ON NUTRITIONAL AND ENVIRONMENTAL EVALUATION OF CANTEEN MENUS IN INSTITUTIONAL CATERING SYSTEMS

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BACKGROUND AND OBJECTIVES
There is a growing increase in the number of meals consumed outside, such as in public canteens and in fast-food chains. These meals may deeply influence the nutritional quality as well as the environmental impact of the total dietary pattern. Currently, there is a limited knowledge about the nutritional and environmental impact of menus/meals offered within the catering system. Thus, within the SUM_LIFE project (www.onfoods.it), a scoping review was performed to analyze existing evidence on the nutritional quality (NQ) and environmental impact (EI) of institutional canteen menus and meals.

METHODS
The search was conducted using PubMed and Scopus databases. Articles published between 2013 and 2023 were included if they were quantitative articles that included the NQ and/or EI of menus or meals served in institutional canteens.

RESULTS
Out of a total of 10762 studies initially retrieved from PubMed and Scopus, seventy-six studies were included in the final evaluation. RESULTS revealed that most articles were conducted in developed high-income countries and in early education centers like schools and nurseries. Most studies evaluated meals and menus for NQ in comparison to EI, with only a limited number measuring both. Moreover, our RESULTS noted that interest in EF increased in recent years, with greenhouse gas emission being the most common indicator.

CONCLUSIONS
The work performed identifies the scarce number of studies assessing NQ and even more EI of institutional canteen menus. By considering the importance of such catering service, findings from this study should promote further initiatives aimed at better comprehend the nutritional, environmental impact of the catering sector as a basis to develop future strategies to improve its overall sustainability.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_122

PHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY OF DANDELION VS. NETTLE

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BACKGROUND AND OBJECTIVES
Dandelion (*Taraxacum officinale* L.) and nettle (*Urtica dioica* L.) have been consumed in various forms as a valuable source of nutrients and are often hailed as superfoods due to their dense nutritional profiles and health benefits. The main bioactive compounds found in these plants are carotenoids, flavonoids (e.g., quercetin), phenolic acids, polysaccharides (e.g., inulin), sterols (e.g., β-sitosterol, stigmasterol), chlorophylls, etc. The aim of this study was to compare the total phenolic content (TPC) and antioxidant activity of lyophilized dandelion (whole plant including roots) and nettle (aerial parts).

METHODS
Total phenolic content was analyzed by the spectrophotometric method with FC reagent at a wavelength of 630 nm. Samples were extracted with 80% ethanol to measure antioxidant activity by *in vitro* assays (DPPH, FRAP and CUPRAC). The composite antioxidant index (ACI) was then calculated to estimate the total antioxidant capacity.

RESULTS
The TPC was found to be 13.25 mg GAE/g in dandelion, while 3.16 mg GAE/ g was found in nettle. All the *in vitro* tests showed higher antioxidant activity for dandelion than nettle, with ACI values ~96% and ~17%, respectively.

CONCLUSIONS
This study highlights the superior phenolic content and antioxidant capacity of lyophilized dandelion compared to nettle. These findings also underscore the dandelion as a more potent natural source of antioxidants, offering promising applications in functional foods and nutraceuticals. Further research could explore additional bioactive properties and their health implications.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_123

STREET FOOD OFFERINGS AT METRO STATIONS, BY SOCIOECONOMIC LEVEL

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BACKGROUND AND OBJECTIVES

Street food is part of Peruvian culture. Although nutritious foods can be found, less healthy options are becoming increasingly popular and frequent in these food vending areas. However, the nutritional composition of street food in urban environments is unknown. The aim of this study was to describe the gastronomic offer of street food vending in the Metro 1 stations of Lima, the composition of the dishes offered, their hygiene characteristics, and their nutritional value according to the socioeconomic level of the district.

METHODS

Line 1 of the Lima Metro is divided into two main sections: the North Section: Connects Villa El Salvador with the center of Lima and the South Section: Connects the Bayóvar station with the center of Lima. In total, 25 stations were evaluated.Work was done on both the North and South sections and on all stations. Student pairs were created to visit each of the stations and observe all the food stalls within 100 meters of the station, filling out a form for each stall that was selling on the street.

RESULTS

The sample was obtained between the months of September and October 2024. The stations with the most stalls and variety of dishes were the stations (n-%), Gamarra (48-27.3%), María Auxiliadora (22-12.5%), Grau (17-9.7%), Bayovar (14-8%), the stations with the least sales were Cabitos, Ayacucho and Jorge Chávez with 1 stall each. The stalls where there is no street vending are La Cultura, San Borja Sur and Angamos. 93.8% (166) of the stalls that sell food do so on the sidewalk around the station. 75.6% (133) of street vendors sell a single dish. The most common food sold (number of stalls) was Ceviche (20), quail egg (huevo de codorniz) (19) mote broth and pork cracklings (sopa de mote y chicharron de cerdo (14 each), Chanfainita (12), green broth and red noodles (sopa verde y tallarines rojos) (11 each). There are other products such as quinoa drinks, chuño (potato), potato with egg, corn with cheese, boiled beans, stuffed potatoes, cancha popcorn, chifles, churros, among others.

CONCLUSIONS

The gastronomic offer in the metro is wide, ranging from elaborate preparations to boiled products, fried foods, salty products, sweets and drinks. Sales are higher in areas with high traffic, however, at the station. The culture is not street vending by municipal order, sales are in restaurants in the surroundings. Numerous street vending is more frequent in areas where the socioeconomic level is low.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO3_127

NUTRITIONAL STUDY OF A BREAD MADE WITH CASSAVA STARCH MODIFIED WITH ALPHA AMYLASE FOR PEOPLE WITH CELIAC DISEASE AND DIABETES

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BACKGROUND AND OBJECTIVES
Recent studies are showing that cassava starch modified with alpha amylase maximize breadmaking properties without the need to add a leavening agent. However, its nutritional properties have not been studied, in particular to know if the finished product can be used for people with celiac disease and diabetes. The aim of this contribution was to evaluate the nutritional properties of a bread made with cassava starch modified with alpha amylase.

METHODS
Cassava starch of the variety INIAP 651 from Ecuador was modified with alpha-amylase (0, 2, 4, 6, 8, 9 enzyme units/g substrate during 20 min). The following nutritional properties of the bread were evaluated from a dough with this modified starch: non-resistant starch (NRS), total starch (TS), resistant starch (RS), rapid digested starch (RDS), slow digested starch (SDS) (1) and glycemic index (GI) (2).

RESULTS
The RESULTS are in line with litterature and showed the following values for the studied treatments in NRS: 39.63 – 45.14 g/100 g, TS: 40.00 – 45.72 g/100 g, RS 0.37 – 0.58 g/100 g, RDS: 15.85 – 27.52 g/100 g, SDS: 15.33 – 27.52 g/100g and GI: 51.25 – 60.99 (3). Best RESULTS were obtained with 9 alpha-amylase U/g that had lower values in NRS, RDS and GI as wells as higher values in SDS.

CONCLUSIONS
Cassava starch hydrolyzed with low levels of alpha amylase allows to obtain bread without gluten with suitable nutritional properties for people with celiac disease and diabetes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_129

FATTY ACID COMPOSITION IN SACHA INCHI OIL AND MICROCAPSULES

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BACKGROUND AND OBJECTIVES
Sacha inchi oil is known for its omega 6 and 3 content, and its inclusion in the diet is widely recommended; however, the consumption of these polyunsaturated fatty acids (PUFA) can be affected during their passage through the gastrointestinal tract. To protect these components, it is possible to use environmentally friendly technologies such as microencapsulation by atomization. The objective was to evaluate the fatty acid composition in sacha inchi oil (SIO) and in its microcapsules (MSIO).

METHODS
To do this, the fatty acid profile analysis was performed in the SIO (Amazonas, Peru) using gas-liquid chromatography, and later in the MSIO, to determine the omega-6/omega-3, SFA/UFA and SFA:MUFA:PUFA ratios.

RESULTS
The RESULTS show that the ratios obtained from SIO and MSIO were not significant (omega-6/omega-3 was 5.37 and 5.57, SFA/UFA was 0.24 and 0.27, SFA:MUFA:PUFA was 1:1.3:2.8 and 1.1:1.4:2.7; respectively); however, the use of atomization favors the protection of the fatty acid content in sacha inchi oil.

CONCLUSIONS
In conclusion, the fatty acid composition in sacha inchi oil was not affected by the processing to obtain microcapsules.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_131

PHENOLIC COMPOUNDS FROM TOMATO REDUCE STARCH DIGESTIBILITY: POTENTIAL FOR DEVELOPING LOW-GLYCAEMIC STARCH MEALS

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BACKGROUND AND OBJECTIVES
Synergistic nutrient combinations may lower postprandial glycaemia and reduce the risk of non-communicable diseases like type 2 diabetes. This study focuses on interactions between starch, the main carbohydrate in Western diets, and phenolic compounds from tomatoes. Given that starch-based foods are frequently consumed with tomatoes or tomato products, this combination may represent an opportunity to develop meals with reduced glycaemic potency. The objective of this study was to assess the effects of tomato polyphenols on starch digestibility, considering different doses, tomato varieties, and processing methods.

METHODS
Phenolics were extracted using a green extraction method (1) from raw tomatoes peels (two varieties) and a commercial tomato paste. Total phenolic content was determined by Folin-Ciocalteu colorimetric method and untargeted metabolomics analysis is used to characterise phenolic compounds in each type of tomato (2). Starch digestibility was evaluated using a single enzyme digestion model, where the endpoint of the reaction is known to correlate with *in vivo* glycaemic index (3). Gelatinised starch was incubated with (poly)phenol extracts at two doses: equal to starch content and half the starch content. The reducing sugars released over 60 minutes were quantified using a DNS colorimetric method (4).

RESULTS
A dose-dependent effect was observed, with greater inhibition of starch digestibility at the higher (poly)phenol extract concentration, where starch digestibility was 7.1% lower compared to the control with no extract, (mixed-model, $p = 0.018$ at 60 minutes). The use of different varieties or the use of processed tomato paste vs raw did not affect this outcome.

CONCLUSIONS
Tomato phenolic compounds can significantly reduce starch digestibility *in vitro*, although high concentrations of (poly)phenols are needed to achieve a significant effect. The lack of variation between tomato varieties and processing methods suggests that even processed tomato products like tomato paste can serve as effective source of bioactive compounds to modulate glycaemic responses. These findings support the feasibility of consuming tomatoes alongside starch-based meals as a practical strategy to lower glycaemic potency, which is now being explored.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_132

POLYPHENOL PROFILE OF SELECTED SEEDS FROM THE SERBIAN MARKET

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BACKGROUND AND OBJECTIVES
Edible seeds are rich in various macro and micronutrients, as well as in some biologically active compounds with a positive health effects. The aim of this work is to identify and determine main phenolic compounds and total phenolics content (TPC) in selected commercial seeds samples (sesame and black sesame, raw and roasted sunflower, raw and roasted pumpkin, chia and linseed) from the Serbian market.

METHODS
The samples were extracted with dichloromethane (in Soxhlet apparatus) and then with 80% methanol. Obtained hydromethanol extracts were dried and analysed. The identification and quantification of phenolics (hydroxybenzoic derivatives (HBAs), hydroxycinnamic derivatives (HCAs), flavonoids and coumarins) was performed using HPLC. Total phenolics content (TPC) was determined spectrophotometrically with FC reagent. The analyzed parameters were used to generate the PCA model.

RESULTS
The highest TPC, especially chlorogenic acid, was determined in raw and roasted sunflower seeds, followed by chia and linseeds. These RESULTS are confirmed by PCA that showed 49.8% (PC1) and 34.1% (PC2) of the total variance of the dataset. According to the PCA for seeds, raw and roasted sunflower seed were the most significant source of total polyphenols and HCAs (first axis: 0.924 and 0.942, respectively); while chia was the most significant sources of flavonoids and coumarin (first axis: -0.696 and -0.531, respectively). Nevertheless, pumpkin seed raw and pumpkin seed roasted were the most significant sources of HBAs (second axes: 0.868).

CONCLUSIONS
This work showed that defatted seeds are valuable sources of various phenolics, mainly phenolic acids. Obtained RESULTS implicate further investigations on this matter in order to clarify their composition and potential as a functional foods components.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_134

TOXIC ELEMENTS (METAL(LOID)S) PROFILING IN GLUTEN FREE CEREAL FOOD

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BACKGROUND AND OBJECTIVES
Not only wheat, barley, rye and oat but also their substitutes used for production of gluten free foods, such as corn, rice, buckwheat and millet, could be contaminated with toxic elements (metal(loid)s), of which only a few are regulated by the law. The objective of the current study was to explore the elemental profiles of gluten free cereal food and provide data for the assessment of dietary exposure and health risk.

METHODS
A total of 88 samples, including flour, bread, breakfast cereals, pasta, biscuits, snacks and cereal bars, all marked with 'gluten free' wording and/or a crossed grain symbol, was obtained on the Serbian market. Concentrations of 23 elements (Be, B, Al, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Sr, Mo, Cd, Sn, Sb, Te, B, Hg, Tl, Pb) were determined using inductively coupled plasma mass spectrometry technique, after microwave digestion of the samples.

RESULTS
The overall occurrence rates of the elements of primary toxicological concern were 70.0% (Cd) > 44.4% (Pb) > 35.6% (As) > 15.6% (Hg). The proportion of the samples containing these elements varied greatly among food groups, within the following ranges (%): Cd 50.0-81.3 (breakfast cereals - biscuits); Pb 0-66.7 (breakfast cereals - flour); As 16.7-50.0 (flour - bread, biscuits); Hg 0-40.0 (breakfast cereals - bars). The ranges of their mean concentrations were the following (μg/kg): Cd 2.5-21.3 (breakfast cereals - bread); Pb not detected-19.3 (breakfast cereals - flour); As 7.6-30.5 (bars - biscuits); Hg not detected-7.1 (breakfast cereals - snacks). The maximum concentration of Pb, determined in one pasta sample, was 76.7 μg/kg, well below the regulatory allowance. However, in case of Cd, maximum concentration (165 μg/kg, in pasta made of rice) was on the verge of the excess. On the other hand, Fe, Cu, Zn and Mn were present in all the samples – besides the possibility of exhibiting toxic effects in case of excessive intake, they are important as essential elements.

CONCLUSIONS
The study underlines the significance of elemental composition of food and provides data for risk assessment. The availability of safe food is of great importance for all consumers, especially those on a specific diet, which limits their food choices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_135

THE ALIMCARE PROJECT - EMPOWERING EDUCATION TO INTEGRATE FOOD AS A PREVENTION TOOL FOR HEALTH AND IN THE CONTINUITY OF CARE WITHOUT GIVING UP THE PLEASURE OF EATING

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BACKGROUND AND OBJECTIVES
As changes in lifestyles and eating habits are responsible for a massive increase in chronic diseases related to diet, there is a need to develop innovative awareness-raising and training programs on the challenges of a healthy, sustainable diet and a diet adapted to the needs of vulnerable people. The 5 year AlimCare project aims to contribute to increase the skills of professionals and educators in the field of catering, health and personal care, whether at home or in a care facility, empowering them to contribute to improving the health of populations.

METHODS
The methdology is based on the development of evidence-based education and training programs (initial and lifelong), practical workshops, particularly culinary workshops, interactive digital workshops and videos. 7 action areas have been determined. In addition, demonstration and experimentation sites will be constructed such as the HealthLab as innovative center for translational studies with transdisciplinary and participatory interventions. All activities targt two topics: 1) healthy and sustainable food to prevent chronic diseases in the general population and 2) food adapted to the needs of frail people (living at home or in care facilities) for better care of people suffering from chronic diseases, while preserving flavours and pleasure of eating. The demonstrations are specially designed for the local food culture and highlighting emblematic products from French regions.

RESULTS
The project ALIMCARE, which will be presented during the event, is a unique initiative both in terms of its topics and its targets. No other similar program has been identified internationally.

CONCLUSIONS
The AlimCare projet propose a new device for the creation and enrichment of initial and continuing health training through food for catering, support for people, home support and care pathways, with a potential for international dissemination.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_136

ORGANOLEPTIC PROPERTIES, NUTRITIONAL CONTENT AND LACTAGOGAL ACTIVITY OF CHICKEN-HERB ESSENCE

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BACKGROUND AND OBJECTIVES
Breastfeeding is one of the important stages in the First 1,000 Days of Life, therefore the sufficient production of breast milk is very substantial. Chicken-herb essence, rich in protein and amino acids, has noticeable benefits, one them is stimulate breast milk production. However, research on its efficacy is still limited. Moreover, the commercially available chicken essence was less preferred. This study aims to formulate a functional drink of chicken essence combined with herbs in order to improve the sensory quality

METHODS
The stages of the research were reformulation of the chicken-herb essence, sensory evaluation and nutritional content analysis

RESULTS
Chemical content showed that 100 g of selected chicken-herb essence contained 121.75 kcal energy, 4.05 g protein, 0.73 g ash, 68.84 g moisture, 26.39 g carbohydrates, and <0.02 g fat. It was detected dipeptide 353,52 ng/mL, 0.31mg Iron/100 g, 14 mg calcium/100 g. Essential and non-essential amino acids were detected with SAA (methionine and cystin) as the limiting amino acid (AAS = 6.66).

CONCLUSIONS
The developed formula (F1-F4) was more preferably and acceptable (aroma, viscosity, taste, mouth-feel, and overall) compared to the commercial one. Lactagogue test in this research (using animal model) showed an increase milk production with difference in baby rat weight is 0.68 units. Therefore Chicken-herb Essence has an effect for improving milk production.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO3_137

MICRONUTRIENT % DAILY VALUES IN FOCUS: SHIFTING FROM DAIRY TO PLANT-BASED MILK ALTERNATIVES

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BACKGROUND AND OBJECTIVES
As the demand for plant-based milk alternatives (PBMiA) grows, assessing their impact on micronutrient % daily value (%DV) is essential. This study measured the effect on the micronutrient %DV of Filipinos with the substitution of dairy milk (DM) with PBMiA.

METHODS
Micronutrient data from PBMiAs and DM nutrition labels sold in Metro Manila were collected. The % DV was calculated based on age categories in the Philippine Dietary Reference Intakes (PDRI).

RESULTS
Calcium %DV will decrease ($p<0.05$) by 6.54–14.65% when all groups shift to coconut-based (COB) and legume-based (LEB) alternatives but not with cereal-based (CEB) or nut-based (NUB). CEB and LEB will increase potassium %DV ($p<0.05$) of adults by 0.07–4.35% while COB and NUB will decrease it (2.23–5.97%). In children, CEB will increase potassium %DV ($p<0.05$) by 5.70%, while NUB will decrease it (7.60%). As expected, sodium %DV will increase ($p<0.05$) by 0.52–5.00% in adults with no effect ($p>0.05$) on the % DV for children. In contrast, zinc %DV and vitamin B1 % DV of all groups will decrease ($p<0.05$) by 105.20–167.00% and 11.70-26.40%, respectively, in all groups. Vitamin B12 %DV will increase with CEB and NUB but will decrease with COB and LEB in adults and with COB in children.

CONCLUSIONS
These RESULTS suggest that shifting from DM to PBMiAs has varied impacts on Filipino consumers' %DV of key micronutrients, highlighting the importance of these factors in informed decision-making.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4 - Global health and planetary nutrition

EPO4_001

EFFECTS OF SMALL-QUANTITY LIPID-BASED NUTRIENT SUPPLEMENTS ON MARKERS OF MICRONUTRIENT STATUS, INTESTINAL HEALTH, INFLAMMATION, GROWTH, AND NEURAL FUNCTION AMONG YOUNG ZAMBIAN CHILDREN: A SECONDARY ANALYSIS OF A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Research suggests that provision of small-quantity lipid-based nutrient supplements (SQ-LNS) benefits growth, development, and survival outcomes among infants and young children in low-resource settings. However, the mechanisms underlying the positive impact of SQ-LNS on these outcomes are not fully understood. To help elucidate these mechanisms, we sought to examine the effects of SQ-LNS on markers of micronutrient status, intestinal health, inflammation, growth, and neural function among young Zambian children.

METHODS

We conducted intention-to-treat, subgroup analyses of 318 children from Zambia enrolled in a 2x2 cluster-randomized trial assessing the effects of SQ-LNS, as well as home-installed growth charts, on linear growth after 18 months of intervention. At endline, hemoglobin was assessed in children's homes using HemoCue devices. At a local hospital, an eye-tracking assessment (n=314) was performed along with a blood draw (n=240). Additional markers of micronutrient status (soluble transferrin receptor, ferritin, retinol binding protein 4, and thyroglobulin) as well as intestinal health (soluble CD14 and intestinal fatty acid binding protein), inflammation (alpha-1-acid glycoprotein and C-reactive protein), and growth (insulin-like growth factor 1 and fibroblast growth factor 21) were assessed via the Multiple-Micronutrient and Environmental Enteric Dysfunction Assessment Tool (MEEDAT). Neural function was assessed via saccadic reaction time. Comparisons by receipt of SQ-LNS vs. not were performed using both unadjusted and adjusted ordinary least squared regression models.

RESULTS

Children in our sample were ~31 months of age and ~54% were female. Just over half (~52%), were stunted at endline. We found no statistically significant differences in markers of micronutrient status, intestinal health, inflammation, growth, or neural function in children who received SQ-LNS vs. not.

CONCLUSIONS

Overall, 18 months of SQ-LNS provision with high rates of adherence had little to no impact on select markers of micronutrient status, intestinal health, inflammation, growth, or neural function in young children in Zambia. These RESULTS indicate that the demonstrated benefits of SQ-LNS for infants and young children are likely through alternative pathways, which should be explored in future research studies.

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EPO4_002

ARE PLANT-BASED DIETS THE WAY FOR MEAT LOVING SOUTH AFRICANS? A QUALITATIVE APPROACH

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BACKGROUND AND OBJECTIVES
Plant-based diets focus on eating more foods derived from plants, such as fruits, vegetables, grains, nuts, and seeds, while reducing the consumption of animal products like meat and dairy (Satija & Hu, 2018). This dietary approach can lead to various health benefits, including better heart health, improved weight management, and a lower risk of chronic diseases. Shifting the focus to plant-based food sources can lower body weight, high blood pressure and risk of heart disease, cancer and diabetes - and can contribute to the environmental impact sustainability (FAO et al, 2019). The South African population has increasingly been facing multiple burdens of malnutrition that includes undernutrition and overweight, obesity, and nutrition-related non-communicable diseases (WHO, 2017). Poor diet is one of the factors that contribute to the increasing rates of overweight, obesity and non-communicable diseases. This study explored the knowledge, attitudes, perceptions and health benefits of plant-based diets amongst South Africans.

METHODS
The study design was a Participatory Action Research, using qualitative approach. A total of 8 focus group discussions were conducted in four provinces. ATLAS.ti 24 computer software was used for analysis.

RESULTS
Participants were knowledgeable about plant-based diets and had a positive outlook on the healthfulness of plant-based diets. The primary reason for not adopting plant-based diets was their cost. A lack of information from health professionals regarding plant-based nutrition facts was expressed. Multiple layers of contextual factors influenced the consumption of plant-based foods and these have been categorised into themes: 1. Knowledge, attitudes and perceptions on plant-based foods; 2. Evolution of dietary patterns and the food system: past, present and influencing factors; 3. Benefits and relationship between plant-based foods and non-communicable diseases; 4. Healthy food environment through home gardening; 5. Actions that can be used to promote the consumption of plant-based diets; 6. Health and nutrition advice for better wellbeing; 7. Animal rights and traditional/cultural beliefs.

CONCLUSIONS
While participants agreed on the health benefits that are associated with the plant-based diets, there are barriers that cannot be overlooked in the South African context. This includes the perceived affordability of the diet and the meat-eating culture that has taken over the country.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_003

BARRIERS AND ENABLERS TO MULTIPLE MICRONUTRIENT SUPPLEMENTATION ADHERENCE IN CAMBODIA: PERSPECTIVES FROM PREGNANT WOMEN, FAMILIES, AND HEALTH PROFESSIONALS

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BACKGROUND AND OBJECTIVES
In Cambodia, iron-folic acid (IFA) supplements have long been provided to pregnant women through antenatal care services at government-run health centers. While IFA supplements can reduce health risks for pregnant women and their offspring, growing evidence suggests that multiple micronutrient supplements (MMS) are a superior prenatal supplement (1-3). The Cambodian Ministry of Health is currently assessing the possibility of transitioning from IFA supplements to MMS as part of the country's standard antenatal care package. The identification of factors that may affect MMS adherence is a critical component of that assessment, as low adherence can compromise supplementation effectiveness. The objective of this study was to explore the potential barriers and enablers to MMS adherence, based on the insights of pregnant women, their family members, and health professionals in Cambodia.

METHODS
Data were collected in the semi-rural province of Kampong Thom in April 2023. Three focus group discussions were held with each of the following groups: pregnant women (n = 19 total participants), family members (n = 18), and midwives (n = 18). Additionally, three in-depth interviews were conducted with maternal and child health chiefs (n = 3), who oversee antenatal care in health centers. Data were analyzed via content analysis through the lens of the social ecological model, using NVivo 14.

RESULTS
Participants highlighted the roles pregnant women, family members, the health system, and community norms may play in influencing MMS adherence. Identified barriers included concerns among pregnant women and their family members about the supplement's quality, side effects, and safety. Additional challenges, such as limited access to antenatal care services and disruptions in prenatal supplement supply chains, were also noted as potential barriers. Conversely, supplementation enablers included the willingness of pregnant women and their families to learn more about MMS, and their openness to a supplement that is safe, effective, and endorsed by the Ministry of Health or health professionals. Moreover, midwives' strong prenatal education and counseling skills, alongside the established norms of prenatal supplementation in Cambodia, may also promote MMS adherence.

CONCLUSIONS
This study provides valuable insights into the factors that could impact MMS adherence among pregnant women in Cambodia. These findings will inform strategies to support the country's transition from IFA supplements to MMS.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_004

NUTRIENT COMPOSITION AND IRON BIO-ACCESSIBILITY OF SOME INDIGENOUS GREEN LEAFY VEGETABLES AND LEGUMES IN GHANA

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BACKGROUND AND OBJECTIVES
Background: Indigenous leafy green vegetables and legumes are nutritious, affordable, and readily available sources of essential micronutrients. Promoting their consumption can improve health, especially in low-income communities. **Objective:** To determine the chemical composition and iron bioaccessibility of indigenous green leafy vegetables and legumes commonly consumed in Ghanaian households

METHODS
Methods:: Five green leafy vegetables and three legumes were purchased, steamed/cooked, cooled, and freeze-dried for analysis. β-carotene content was quantified using modified ISO BS EN 12823:1-2014, and vitamin A equivalents were estimated. Vitamin C was determined using the 2,6-dichlorophenolindophenol method. Iron was determined using acid digest and ICP-MS, and iron bioaccessibility was assessed using a static in vitro gastric digestion method and ICP-MS. Phytate was determined using a titration method. Data were analyzed using one-way ANOVA and presented on a dry matter basis

RESULTS
RESULTS: The green leafy vegetables had significantly higher amounts of all examined nutrients compared to the legumes, though phytate levels varied. RESULTS are presented in the Table. All values in mg/100g except Vit A which is in µg RAE/100g; RAE=Retinol Activity

	β-Carotene	**Vit A**	**Vit C**	**Iron**	**Iron BA**	**Phytate**
Xanthosoma s.	10.39a	1732.84a	47.44d	9.60ab	2.31b	0.09bc
Corchorus olitorius	5.86d	977.74d	70.81b	17.52ab	5.77ab	0.14ab
Spinacia olerace	1.59e	264.50e	40.60e	36.45ab	8.05a	0.19a
Talinum triangulare	8.79b	1466.00b	79.07a	39.80a	4.99ab	0.11bc
Taraxacum officinale	7.99c	1334.18c	35.44f	22.57ab	3.54b	0.05c
Phaseolus vulgaris	0.04a	4.50c		4.33ab	0.75a	0.11a
Vigna angularis	0.05a	8.33a		7.19a	2.11a	0.13ab
Arachis hypogaea	0.04a	5.59b		2.79b	2.03a	0.08b

CONCLUSIONS
CONCLUSIONS: Green leafy vegetables generally contain higher quantities of β-carotene, vitamin C, iron content, and iron bioaccessibility. Among legumes, red beans and peanuts had more bioaccessible iron and less vitamin A precursor, and low phytate levels in both foods. These foods have the potential to alleviate micronutrient deficiencies when consumed daily and could be promoted through nutrition education and advocacy.

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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_005

AUTOMATIC MENU CREATION FOR SCHOOL LUNCH BASED ON ESTIMATION OF DISH GENRES CONSIDERING THE FUSION OF MULTIPLE GENRES

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BACKGROUND AND OBJECTIVES

In Japan, it has become common to include multiple dish genres in a menu. For example, multiple genres, such as Japanese, Western, and Chinese are included in one menu. Many elementary and junior high schools in Japan provide school lunch, which are important in passing on food culture such as the fusion of multiple genres. Creating a school lunch menu takes a lot of time and effort because it requires consideration of various factors, such as nutritional intake, ingredient costs, and dish genres.

In previous studies on automatic menu creation for school lunch, models based on combinatorial optimization that consider nutritional intake and ingredient costs were proposed. However, menus were created by combining dishes from the same genre, so the models were not able to create menus that combined multiple genres. In this study, we propose an algorithm that automatically estimates the dish genres to assign multiple genres to a menu. We aim to automatically create school lunch menus that consider the fusion of multiple genres based on genre estimation.

METHODS

To estimate the dish genres, we focused on the name of the dish. If the name of the dish contained words related to a genre, we assigned the genre to the dish. Next, we focused on the combination of dishes in a menu. The genre assigned to the staple food or main dish was also assigned to the other dishes in a menu. We constructed an algorithm that performs these procedures automatically.

We formulated a menu optimization problem based on a model proposed in a previous study. We constructed a model that creates menus that include multiple genres by setting one genre for each menu and selecting dishes that include the genre within the assigned genres.

RESULTS

We applied the proposed genre estimation algorithm to dishes contained in school lunch menu data. We confirmed that it is possible to assign multiple genres to one dish. Furthermore, from the RESULTS of menu creation using the model, it was possible to create a menu that combined multiple genres. By using the model based on genre estimation, it was possible to realize combinations of dishes that were not possible in previous studies.

CONCLUSIONS

In this study, we proposed an algorithm to automatically estimate the dish genres. We also automatically created a menu that combined multiple genres. As a result, it became possible to create a menu similar to the one actually served at school lunch in Japan.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO4_006

MAPPING AND CHARACTERIZATION OF SOLIDARITY KITCHENS IN BRAZILIAN REGIONS

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BACKGROUND AND OBJECTIVES
The COVID-19 pandemic exacerbated the issue of food insecurity in Brazil, worsened by the lack of government action during that period. In response, social movements mobilized to mitigate the hunger crisis across various Brazilian states. Brazilian Law No. 14,628 of 2023 marks the creation of the Solidarity Kitchen Program, highlighting the political commitment to ensure the Human Right to Adequate Food (HRAF), as established in the Federal Constitution. The Program aims to recognize Solidarity Kitchens (SKs) that are committed to providing free, quality meals to the population, prioritizing vulnerable groups, including people experiencing homelessness. This context emphasizes the importance of developing and implementing concrete actions to maintain and improve the operation and infrastructure of these spaces. This research aims to describe and characterize the SKs, considering social vulnerability indicators in territories across Brazilian regions.

METHODS
Data were collected using the Registration Form for Solidarity, Popular, and Community Kitchens, developed by the Ministry of Social Development and Assistance, Family, and Fight Against Hunger. The form received 2,466 responses between May and November 2023, and the database was shared on March 22, 2024. After excluding 811 non-operational kitchens, 1,655 fully functional kitchens remained. These data were cross-referenced with Social Vulnerability Indicators from the Institute for Applied Economic Research.

RESULTS
The mapping revealed that many municipalities with high or very high vulnerability do not have any SKs available, with most of these units being concentrated in capital cities or nearby areas. Over 50% of SKs in all Brazilian regions reported a lack of IT infrastructure (computer with internet access), with the worst situations observed in the South (66.4%), Northeast (65.2%), and North (60.9%) regions, followed by the Center-West (56.5%) and Southeast (54%). This scenario hinders communication with government agencies and affects the evaluation of public policies that support or invest in SKs. Additionally, 18.8% and 20% of SKs in the North and Northeast regions (the hottest areas in the country), respectively, reported not having refrigerators (compared to 5.8% in the Southeast, 9% in the South, and 9.8% in the Center-West), negatively impacting the productivity of these spaces and the quality of meals, thus compromising services to the population.

CONCLUSIONS
These RESULTS may support the formulation of public policies to guarantee HRAF in vulnerable territories and to create a network-based, intersectoral model to support SKs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_008

IMPACT OF A CARBOHYDRATE EDUCATIONAL TOOL WITH FIBER CONTENT ON DIABETES SELF-MANAGEMENT

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BACKGROUND AND OBJECTIVES
This study evaluates the effectiveness of a carbohydrate educational tool designed to improve self-care in diabetic patients. The tool is a color-coded system (green, yellow, red) based with dietary fiber content to improve patient in making healthier food choices.

METHODS
Over six months, 67 participants (mean age 57.1 ± 14.4 years) were enrolled. The intervention's impact was assessed using paired sample t tests and Pearson's correlation coefficients.

RESULTS
Significant improvements in HbA1C levels were observed, decreasing from 8.6 ± 2.5% to 7.4 ± 1.5% ($t = 4.007$, $p = 0.001$). Correlations between Self-Care score and HbA1C(after), and dietary attitude were medium correlation ($r=0.323,0.442$, respectively). Self-Care score and dietary fiber intake, dietary cognition were low correlation ($r=0.259, 0.244$, respectively). Participants who frequently chose green-labeled foods had higher dietary fiber intake and better scores in self-efficacy, dietary cognition, and dietary attitude. The tool effectively enhanced patients' ability to make informed food choices, supporting better blood sugar management.

CONCLUSIONS
The carbohydrate educational tool with fiber content significantly improved diabetic self-effective, self-management, dietary cognition, attitude, and better to blood sugar control.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_009

FOOD-BASED INDICES FOR THE ASSESSMENT OF NUTRITIVE VALUE AND ENVIRONMENTAL IMPACT OF MEALS AND DIETS: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

Food consumption practices are impacting both human and planetary health [1, 2]. Food-based labelling is a commonly used strategy intended to influence consumption practices. To date most food-based labelling focuses on the nutritive value of foods, however, there is a growing need to include information on the environmental impact of foods and meals [3]. This complex information may make it difficult for consumers to improve food choices with respect to human and planetary health. A simplified approach is needed that expresses a foods health *and* environmental value. This systematic review aimed to identify existing food-based indices that classify or rank meals and diets in terms of nutritive value and environmental impact – termed Nutritive and Environmental Combined Indices (NECIs). The review examined the key characteristics of NECIs and identified their intended public health purpose.

METHODS

Following the PRISMA 2020 standardised reporting guidelines, six bibliographic databases were searched using keywords related to ‘nutrition’, ‘environment’, ‘health’, ‘index’, ‘meal’ and ‘diet’. Records of retrieved studies were screened independently using Ryyan software by two reviewers.

RESULTS

21 studies were included for analysis in the review. Within these studies 21 NECIs were identified, with 5 specifically designed for use in meals, 8 for diets, and 8 offering scope to be applied to meals or diets. 48% of indices (n=10) incorporated an additional sustainability dimension, most commonly economic (n=8). Most indices, 71%, presented nutritive and environmental scoring as a single metric (n=15), 19% of indices presented scores in parallel (n=4), and two studies presented their respective indices as both a single metric and in parallel. The 21 NECIs varied widely in their nutritional and environmental scoring methods, functional units, system boundaries, and ranking approaches. The most common approach to scoring the nutritional and the environmental dimensions of NECIs was the Nutrient Rich Diet (NRD) score (n=6) and Life Cycle Assessment (n=14), respectively, and among single-metric NECIs, 47% applied equal weighting to included dimensions (n=8).

CONCLUSIONS

This systematic review highlights the number, and methodological variety, of existing food-based labelling indices that assess nutritive value and environmental impact of meals or diets. These findings can be used to assist public health actors in the future development of a standardised index to support healthy and sustainable meal and diet choices.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO4_012

THE EFFECT OF QUINTUPLY-FORTIFIED SALT ON THE GUT MICROBIOME OF NON-PREGNANT WOMEN OF REPRODUCTIVE AGE IN PUNJAB, INDIA; A SUBSTUDY OF A RANDOMIZED, COMMUNITY-BASED TRIAL

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BACKGROUND AND OBJECTIVES
Women of reproductive age (WRA) in resource-limited settings are vulnerable to multiple micronutrient deficiencies including iron, zinc, folate, and vitamin B12. Large-scale food fortification (LSFF) of staple foods and condiments offers a cost-effective approach to improving micronutrient intake. However, the impact of LSFF on the gut microbiome remains poorly understood. This analysis aimed to determine whether quintuply-fortified salt (i.e. salt fortified with iron, zinc, vitamin B12, folic acid, and iodine) alters the gut microbiome in non-pregnant WRA (NPWRA) after 12 months.

METHODS
A double-blind, randomized, controlled community-based trial was conducted among 998 NPWRA (18-49 years) in Punjab, India. Eligible participants were randomized to receive: 1) quintuply-fortified salt with 1.3 mg iron in the form of encapsulated ferrous fumarate, 1.4 mg zinc, 0.6 µg vitamin B12, 52 µg folic acid, and 30 µg iodine (eFF-Q5S); 2) quintuply-fortified salt with the same micronutrients, but with iron in the form of encapsulated ferric pyrophosphate plus EDTA (FePP-Q5S); or 3) standard iodized salt (IS). Stool samples were collected from a subsample of NPWRA representing all three study groups at baseline and 12 months and subjected to 16S rRNA gene sequencing. Linear mixed models were used to estimate intervention effects on alpha diversity (Shannon index and the abundance-based estimator (ACE) index). Permutational MANOVA (PERMANOVA) was used to test Bray-Curtis dissimilarity between groups (beta diversity). Zero-inflated negative binomial mixed models were used to evaluate intervention effects on the relative abundance of individual taxa.

RESULTS
Among the 129 NPWRA who provided both a baseline and 12-month stool sample, 86 had sufficient read depth following sequencing (eFF-Q5S, n = 33; FePP-Q5S, n = 26; IS, n= 27). Mean ± SD household salt intake across the intervention period ranged from 6.24 ± 1.31 g/adult female equivalent (AFE) per day in the FePP-Q5S subgroup to 5.68 ± 1.13 g/AFE per day in the IS subgroup. The most abundant genus groups at baseline were *Prevotella* (24.9%) and *Bifidobacterium* (10.6%). Neither alpha diversity nor beta diversity differed significantly at baseline or at the end of the 12-month intervention. There was no difference in the relative abundance of *Enterobacteriaceae*, *Lactobacillus*, and *Bifidobacterium*, *Prevotella or Streptococcus* across groups following the 12-month intervention period.

CONCLUSIONS
Quintuply-fortified salt did not appear to alter the gut microbiome of NPWRA in Punjab, India.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_013

ESTIMATING THE HEALTH IMPACTS OF LOW-SODIUM PEA PROTEIN ISOLATE-BASED MEALS

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BACKGROUND AND OBJECTIVES

The development and consumption of plant-based meat alternatives is on the rise in Sweden as elsewhere in Europe. Many of these products have high sodium content [1]. Efforts are therefore needed to improve their nutritional profile. In this project, the process to obtain pea protein isolate (PPI), a major ingredient in many plant-based products, is optimized to achieve a reduced sodium content. Objective of this work is to estimate the health impact of meals based on reduced sodium pea protein versus current sodium pea protein as well as against meat-based meals.

METHODS

A diet scenario is modelled based on consumption of a pasta meal containing either mince from an extruded low sodium PPI, standard sodium PPI or meat mince (mixed beef and pork). The recipe is based on one widely used in public school meals in Sweden. The nutritional and protein profile of meals are estimated with the Nutrient Rich Food index (NRF) 11.3 [2] and the quality-corrected (q-c) protein score [3]. The health impact of reduced sodium intake is estimated according to the HENI index by obtaining characterization factors specific for Sweden from the Global Burden of Disease study [4].

RESULTS

RESULTS are preliminary, as the project is still on-going. The process optimization to obtain a low sodium PPI is described elsewhere [5]. The optimized PPI contains ≤ 0,1 g/100 g sodium, and the derived texturized product has at least a 4 times lower sodium than commercial products. Nutritional analytical data are not yet available for the low sodium texturized mince, therefore NRF11.3 and the q-c protein score are estimated from food composition tables [6]. Nutrient density according to NRF11.3 of the low sodium PPI pasta meal is more than double that of a meat pasta meal (40 vs. 18 NRF score) but only slightly higher than a regular salt PPI pasta meal (38 NRF score). However, the q-c protein is 34% higher in the meat mince than in both the pea-based minces. For the assessment of the HENI index, the calculation of dietary risks factors specific for Sweden is on-going. Using the best available data from a Dutch study [7], and accounting only for the sodium content, a portion of the low sodium PPI pasta meal contributes to 48% and 17% less minutes of healthy life lost compared to a meat or regular salt plant-based pasta meals, respectively.

CONCLUSIONS

This study preliminarily indicates that a low sodium plant-based meal could provide higher nutrient density and less minutes of life lost compared to a meat-based meal, and only marginally compared to a regular salt plant-based meal.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO4_014

A GLANCE OF TRADITIONAL FOOD SYSTEMS AMONG KAZAKH AND KYRGYZ PEOPLES IN THE EURASIAN STEPPE IN TEKES, XINJIANG, CHINA

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BACKGROUND AND OBJECTIVES

Eurasia's steppe, the world's largest contiguous rangeland, has supported nomadic pastoralism for over 5,000 years. The Kazakh and Kyrgyz, cross-border ethnic groups primarily residing in Kazakhstan, Kyrgyzstan, and China, face high rates of non-communicable diseases (e.g., hypertension) and micronutrient deficiencies (e.g., iron). However, their traditional food systems remain understudied. Existing literature and policies focus on meat and milk, disregarding the historical use of diverse fruits, nuts, and herbs by Kazakh nomads documented by Russian anthropologists in the 17th Century.

METHODS

To address inconsistencies between current knowledge and historical records, a questionnaire based on Xinjiang Agricultural University's research into wild edibles was used. Elders with pastoral experience were invited via chain sampling to identify ingredients, describe preparation methods, and discuss medicinal uses. Interviews continued until data saturation, involving 30 participants from Tekes, Xinjiang—a settlement for Kazakh and Kyrgyz peoples with nomadic traditions.

RESULTS

A total of 98 food ingredients were identified, including 11 types of animal meat, 7 types of animal milk, 73 wild plants, 2 types of honey, and 5 edible soils. There is a rich tradition of gathering wild plants during grazing and consumed as fruits, jams, or tea. Consuming like tea was the most common way to consume plant-based foods, and almost half of plant-based foods can be consumed like tea. Reducing blood was the most common medicinal function, and approximately 20% of the wild plants were believed to have such a property. Barriers to accessing and using traditional foods included over-grazing, the use of fertilizers, tourism development, resettlement, lifestyle changes, pasture loss, environmental regulations, and climate change. Interaction with Han and Hui groups introduced more knowledge and use of wild plant-based foods and fish.

CONCLUSIONS

This study demonstrates that traditional nomadic food systems include a diverse range of food ingredients that are underutilized and often forgotten in daily life and academic studies. These underutilized foods have huge potential to alleviate non-communicable diseases and micronutrient deficiency and improve plant-based food availability of nomadic people in the Eurasian steppe. To develop sustainable nomadic food systems and promote planetary health on the Eurasian steppe, it is crucial to further study and value the traditional knowledge and food ingredients of nomadic food systems.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO4_015

BULGARIAN DIETARY TRADITIONS IN THE PAST AND RECENT TIMES AND A LINK TO PLANETARY NUTRITION

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BACKGROUND AND OBJECTIVES

Bulgarian food patterns have evolved significantly from traditional practices to modern dietary trends, reflecting historical, cultural, and socio-economic changes. Historically the Bulgarian diet centered on locally sourced, seasonal foods, emphasizing plant-based foods such as grains, vegetables, legumes, and less dairy products with low meat, poultry, fish, and egg consumption. In recent decades urbanization and globalization have shifted the dietary habits of Bulgarians to more animal foods, processed and convenience foods, raising concerns about health and sustainability.
However, there is an elevating interest in rediscovering some traditional dietary models and promoting Bulgaria's gastronomic heritage which is in line with the recently promoted planetary nutrition.
The aim is to compare the average dietary intake of some selected foods/food groups by the Bulgarian population at the beginning of the 20th century (1906-1911) and the average intake in the period 2019-2023, as well as with the healthy planetary trends.

METHODS

The sources for food intake data were the available published papers on nutrition and food intake of the Bulgarian population from the beginning of the last century and the recent data from the National Statistics Institute of Bulgaria. The data are presented in g/per person per day. The RESULTS are discussed in line with the directions of the planetary nutrition recommended as a healthier option for human health and the planet

RESULTS

The Bulgarian past times dietary model compared to recent food intake is characterized by low intake of animal foods in g/person/day (red meat- 50.5/101.9; poultry - 3.58/26.7; fish - 4.3/ 16.1, milk and dairy products - 67.6/128.65, eggs – 49/158 pcs per year). The diet is mainly plant foods, rich in wholegrain bread and cereals (665.7/ 255.4 g/person/day), little variety of vegetables, mainly cabbage and beans, and low in fresh fruits (42.05/147.7 g/person/day). The diet from the beginning of the 20th century covers limited consumption of animal protein, and less variety of vegetables and fruits. Some positive trends of the past are the low intake of added sugar (6.3/17.6 g/person/day) and salt.

CONCLUSIONS

The current Bulgarian diet reflects the convergence and adaptation influenced by globalization. Integrating some Bulgarian traditional food patterns from the past with current healthy dietary guidelines can successfully align the diet to the planetary nutrition concept.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO4_017

NUTRITIONAL STATUS, EATING HABITS, AND NUTRITIONAL EDUCATION IN ADOLESCENT STUDENTS FROM MARGINALIZED COMMUNITIES IN GUANAJUATO: A CALL FOR SUSTAINABLE ACTION

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BACKGROUND AND OBJECTIVES
The promotion of sustainable food systems and global health is essential to achieving the United Nations' 2030 Agenda for Sustainable Development. Understanding the nutritional status of vulnerable populations provides critical insights for addressing malnutrition and promoting equity in health and education. This study aimed to evaluate the nutritional status, eating habits, and level of nutritional education among high school students from marginalized communities in Guanajuato, Mexico. Additionally, it highlights the urgent need to improve school meal programs, which currently offer low-nutritional-value foods, by incorporating the expertise of nutritionists and advocating for policy adjustments to combat malnutrition.

METHODS
This cross-sectional study analyzed data from the researcher's teaching activities in natural sciences and physical education with 76 high school students (14–18 years) in Guanajuato. Data collection included questionnaires, dietary recalls, fitness tests, and anthropometric measurements, conducted during routine classes. The data were gathered during routine class activities and anonymized to ensure confidentiality, adhering to principles of respect and confidentiality without requiring formal ethical approval or authorizations.

RESULTS
The study revealed that 49% of participants had a normal weight, 33% were underweight, 13% were overweight, and 5% were obese. Only 15% of students ate breakfast before school, while 71% consumed three to four meals per day. Alarmingly, 80% of the participants regularly consumed foods of low nutritional value, and only 5% included vegetables in their daily diet. A significant protein deficit was also identified, with most students failing to meet recommended dietary intakes, contributing to poor muscle development and physical performance. Moreover, 85% lacked basic knowledge of nutrition, and over 50% exhibited poor physical fitness and muscle strength. Notably, several students relied on school meal programs promoted by the government, which provided meals with inadequate nutritional content, exacerbating poor health outcomes.

CONCLUSIONS
More than 80% of students displayed malnutrition and poor physical performance. Urgent policy adjustments are needed to restructure school meal programs under the guidance of nutritionists to promote sustainable, healthy diets. These changes will empower adolescents to adopt better habits, improving their quality of life and supporting the 2030 Agenda for Sustainable Development.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_018

EXAMINING THE EFFECT OF EGGS IN PREGNANCY ON CHILD GROWTH AND DEVELOPMENT: STUDY DESIGN, STUDY POPULATION, AND ADHERENCE IN A RANDOMIZED CONTROLLED TRIAL IN RURAL RWANDA

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BACKGROUND AND OBJECTIVES
Adequate nutrition during pregnancy is essential for maternal and child health. Animal-source foods (ASF), such as eggs, have been shown to positively impact child growth and development in some settings, but less is known about benefits if consumed consistently during pregnancy. The *Deux Oeufs* study is a randomized controlled trial designed to assess the effects of egg supplementation on maternal health and child growth outcomes in rural *Nyagatare* District, Rwanda. This paper describes the study design, baseline characteristics of the study population, and preliminary adherence findings.

METHODS
We will enroll 956 pregnant women and randomize into two groups: a treatment group provided two eggs daily (directly observed) from enrollment in the first trimester until childbirth, and a control group maintaining their typical diet. All participants will receive standard prenatal care, a fortified flour, health insurance, mobile phones, and modest compensation. The primary outcome is child length-for-age z-score at birth. Secondary outcomes include maternal health metrics and child growth and neurodevelopment measures during pregnancy, at birth, and at six weeks and six months postpartum.

RESULTS
As of December 01, 2024, 386 women have been enrolled and enrollment is expected to be completed by August 2025. Initial RESULTS show that 89.7% of intervention women have attended at least 90% of possible egg consumption days, and intervention women have consumed the dose of two eggs on 99.8% attended consumption days. Additional RESULTS will include a full description of the study design, baseline characteristics of study participants, including nutritional status, prevalence of ASF consumption, dietary diversity, food security, demographic and socioeconomic status, and intervention adherence data.

CONCLUSIONS
To our knowledge, this is the first trial to examine the effects of providing two eggs during pregnancy in sub-Saharan Africa. Findings will help inform whether the consumption of a locally available and scalable ASF can provide maternal and child health gains that could potentially translate into longer-term benefits.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_019

A MULTI-NUTRIENT PACK IS BENEFICIAL FOR IMPROVING THE NUTRITIONAL AND IMMUNE STATUS OF PATIENTS WITH PULMONARY TUBERCULOSIS: A DOUBLE-BLIND RANDOMIZED CONTROL TRIAL WITH A 6-MONTH FOLLOW-UP

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BACKGROUND AND OBJECTIVES
Nutrition is critical for anti-tuberculosis treatment. The aim of this study is to investigate the effect of a multi-nutrient pack on patients with pulmonary tuberculosis.

METHODS
We conducted a double-blinded, randomized controlled trial in 840 adult patients with pulmonary tuberculosis in China, who were randomly divided into the multi-nutrient pack (containing protein, vitamins A, B1, B2, niacin, B6, folic acid, B12, C, D, E, calcium, iron, zinc, and selenium) intervention group or the placebo (a cereal matrix with no micronutrients) group. The intervention lasted for six months. The nutritional status, clinical symptoms, sputum smear RESULTS, and immune function were recorded during the intervention.

RESULTS
Compared with the placebo group, the multi-nutrient pack intervention significantly improved the patients' body weight, hemoglobin, and total lymphocyte count of patients by 6.3%, 11.1%, and 7.5% respectively at the end of the trial (P=0.044, P=0.044, and P=0.052, respectively). The consumption of multi-nutrient pack improved the differential white blood cell (WBC) count and the lymphocyte subpopulation count. The sputum smear conversion was shorter in multi-nutrient pack group than placebo group (P=0.006). Patients with hypoproteinemia or anemia at baseline benefited more from multi-nutrient pack than those with normal levels.

CONCLUSIONS
In conclusion, the multi-nutrient pack is beneficial for improving the nutritional status, immune function and clinical symptoms especially in hypoproteinemia or anemia patients with pulmonary tuberculosis; which may be related to its optimal compliance, convenience, and low cost during the trial.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_023

DEVELOPING AND VALIDATING AN EXPERIENCE-BASED FOOD-SAFETY SCALE USING QUALITATIVE INSIGHTS FROM BANGLADESH, ETHIOPIA, AND VIETNAM

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BACKGROUND AND OBJECTIVES
Unsafe foods constitute a major global health challenge with an estimated 600 million episodes of foodborne illness and 420,000 deaths annually. Food safety and nutrition are closely linked: foodborne illness contributes to undernutrition (e.g., through reduced nutrient bioavailability); the most nutrient-dense foods carry the largest food safety risks. Concerns about food safety are important determinants of dietary choice, but current methods to assess food safety overlook consumers' experiences. Our objective was to develop a cross-culturally appropriate and user-friendly scale to assess food safety experiences in LMICs. Developing this scale requires identifying the important constructs that constitute the experiences of food safety that the scale should reflect.

METHODS
A scoping review was conducted to identify existing constructs related to consumers' experiences of food safety from 213 studies. Qualitative interviews were conducted with consumers from Dhaka, Bangladesh (n=51), Addis Ababa, Ethiopia (n=50), and Hanoi, Vietnam (n=41) to provide an in-depth understanding of the cognitive, emotional, social, and contextual constructs that influence food-choice behaviors related to food safety. A constant comparative method was used for coding and analysis.

RESULTS
Food safety was conceptualized as dynamic and multifaceted. Eleven constructs emerged: sensory attributes, attitudes, affect, awareness, knowledge, previous incidents, preferences, risk perceptions, trust, intentions, and behaviors. From interviews, trust, attitudes, risk perceptions, and previous incidents were central in shaping mental representations of food safety and subsequent behaviors. Constructs related to affect were not uniform: concern about chemicals differed from that about cleanliness, environmental hygiene differed from vendor honesty, and worry about a child's reaction to foods differed from family dietary patterns. Trust was linked to specific, repeated interactions and vendor responsiveness. Emotions were salient, making constructs like trust and concern nuanced and tailored to experience. Consumers employed routine strategies and specific, observable indicators to reduce food safety risks.

CONCLUSIONS
Food-choice behaviors related to food safety are complex and necessitate the development of a scale that assesses experiences related to food safety. Insights from the review and interviews informed the development of questionnaire items, which are under review by experts in preparation for cognitive interviewing.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_024

LEVERAGING LOCAL PLANT-BASED INGREDIENTS AND ONLINE PLATFORMS TO MINIMIZE CROWDS AND PREVENT VIRUS TRANSMISSION DURING THE PANDEMIC

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BACKGROUND AND OBJECTIVES
The pandemic underscored the increased risk of cluster infections in traditional markets and supermarkets. To address this, a team of nutritionists launched a non-face-to-face online platform offering "local vegetables and fruits" and "anti-epidemic bentos," with online payment options, to minimize the infection risk for employees.

METHODS
The services, "local vegetables and fruits" and "anti-epidemic bentos," were available from April 2021 to June 2022. Google Forms was used for employees to place orders and select pick-up times. An online survey was conducted to gather employee feedback on their experiences.

RESULTS
A total of 202 responses were received. Of these, 97% of employees believed that a balanced, plant-based meal could help prevent viral infections. Additionally, 91% (183 individuals) felt that purchasing fresh food from external sources increased infection risk. Notably, 97% agreed that the "anti-epidemic bento" effectively reduced the risk of infection and provided a sense of security.

CONCLUSIONS
Most employees indicated that purchasing "local vegetables and fruits" and "anti-epidemic bentos" significantly reduced the risk of cluster infections while providing balanced nutrition to boost immunity. Therefore, the provision of non-face-to-face meal services has proven to be an effective strategy to enhance employee safety, prevent infection, and improve overall quality of life.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_025

GLOBAL POLICY CHANGES ON HOMOLOGOUS SUBSTANCES OF FOOD AND MEDICINE

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BACKGROUND AND OBJECTIVES
Homologous substances of food and medicine (HSFM) are substances that are both food and traditional Chinese medicine (TCM), implementing the TCM concept of "food and medicine homology". Due to the improvement of people's standard of living and the high demand for improving the quality of life, the usage of HSFM is becoming more and more common, and the legislative issue of HSFM is becoming more and more urgent. HSFM now have a clearer definition and related management policies, which are constantly being improved and updated. However, there is little research to sort out and analysis the current status of management in each country. Therefore,we aims to collect the relevant policies that are publicly available in several country and, in particular, elucidates explicitly the historical traceability of HSFM in China, the evolution of the relevant policies, and the catalogue of HSFM that has been updated to date.

METHODS
Sort out the changes in China's dual-use material policy for food and medicine, and analyze the list of HSFM of China. Simultaneously collect and analyze policies similar to HSFM in China of other countries such as the United States, the European Union, South Korea, Japan, and Canada.

RESULTS
The data show that the management of HSFM is similar but not identical among different countries, and that there are areas that can be learnt from each other as well as areas that need to be improved. By analysing the policies of different countries, this paper finds that South Korea, Singapore and China have adopted a catalogue for the management of HSFM, which has avoided the current situation of market scrutiny through a clearer catalogue management.It also points out that there is no country that makes health claims on HSFM in terms of policy, which also limits the development of the HSFM industry to a certain extent . A comparison of policies in different countries shows that policymakers can optimise policies to meet consumer demand and stimulate product development in the market by accelerating the addition of substances to the catalogue of HSFM and attempting to make health claims, among other measures.

CONCLUSIONS
HSFM play a certain role in residents' health, and the national government needs to formulate corresponding policies for effective management.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_026

SLUDGES ON THE WAY OF HEALTHY NUTRITION: UNDERSTANDING BARRIERS TO HEALTHY FOOD CHOICES, INSIGHTS FROM AN EXPERT PANEL

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BACKGROUND AND OBJECTIVES
Nudge theory has promoted healthier food choices, yet the concept of "sludge" — frictional elements that obstruct beneficial decisions — remains underexplored in food systems. Sludges can manifest in various forms, such as poor product placement in supermarkets, complex labeling in canteens, or insufficient support for informed choices in hospital settings. These hurdles complicate decision-making processes, steering consumers away from healthier options. Despite its potential significance, the operationalization of sludges in the food system and their role in shaping consumer behavior remains unclear.
This study aims to establish a clear and comprehensive definition of sludges as applied to food systems, identify the mechanisms through which they operate, and assess their impact on consumer behavior and policy frameworks. The ultimate goal is to build foundational evidence to inform strategies that mitigate sludges and facilitate healthier food choices.

METHODS
To informed the design of our Delphi study, we conducted a systematic literature review and semi-structured interviews with experts in behavioral economics and nutrition . Ninety experts from fields such as public health nutrition and food policy are participating in two iterative survey rounds. The study aims to achieve consensus on the types, mechanisms, and impacts of sludges in out-of-home food environments.

RESULTS
We aim to develop an operational definition of sludges, identify key mechanisms hindering healthy choices, and assess their severity. Findings will inform actionable policy recommendations to mitigate sludges and guide future behavioral experiments to improve consumer food environments.

CONCLUSIONS
This research will clarify the concept of sludges and their implications for food systems, contributing to healthier and more equitable environments by supporting interventions that facilitate informed consumer decisions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_027

DESIGNS OF NUTRITION INTERVENTIONS IN FRAGILE SAHELIAN COUNTRIES COULD BE IMPROVED BY BETTER PROCESS AND IMPACT EVALUATIONS

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BACKGROUND AND OBJECTIVES

Despite investments to improve nutrition, progress has stalled in the West African Sahel where malnutrition remains high, with child stunting at 47% in Niger and anemia in pregnant women at 59% in Mali. We aimed to 1) understand what intervention designs in these fragile states addressed key malnutrition drivers, 2) assess the evidence on designs that improve malnutrition, 3) elucidate design strengths and weaknesses, and 4) determine what lessons can be learned to improve designs. Findings will inform design improvements of nutrition initiatives in fragile states to enhance nutrition and health.

METHODS

We assessed designs and outcomes of nutrition initiatives over the last 10 years in Burkina Faso, Chad, Mali, Mauritania, Niger and Senegal, triangulating: 1) a review of peer-reviewed, grey literature, and impact and process evaluations of multisectoral interventions, in English and French; and 2) semi-structured key informant virtual interviews in French and English with funders, project designers and implementers in the region. Country case studies focused on Senegal and Chad and a thematic analysis used a six-step reflexive approach. A design gap analysis was undertaken by mapping RESULTS against two conceptual frameworks.

RESULTS

We conducted 29 interviews and assessed 64 documents from 41 studies. Initiatives targeted immediate (81%), underlying (73%), and systemic (70%) drivers of malnutrition. Less than 35% conducted robust impact evaluations and no clear pattern emerged, but several multisectoral interventions achieved positive impacts. Four themes converged: 1) situational analysis and targeting, 2) theory of change (ToC) and formative research, 3) monitoring and evaluation, and 4) stakeholder engagement to foster sustainable, long-term change. Strengths included in-depth early-on contextualization, (e.g participatory approaches rooted in self-identified community needs), integration within existing structures, adequate monitoring and evaluation, robust ToCs and flexibility to adapt to changing contexts. Weaknesses included choice of inappropriate indicators, lack of mechanisms for accountability, uncoordinated role of different partners, and lack of policymaker engagement.

CONCLUSIONS

Our RESULTS highlight the importance of investing in robust ToCs; co-design / co-monitoring with local governments and communities for strong governance, contextualization and sustainability; and robust process and impact evaluations. The paucity of impact evaluations limits our understanding of optimal designs, and development/humanitarian interventions should be coupled with research to build the evidence base.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO4_028

FOODWAL: PROMOTING SUSTAINABLE FOOD SYSTEMS IN WALLONIA : INNOVATIONS BASED ON COLLABORATIVE INTER-DISCIPLINARY NETWORK

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BACKGROUND AND OBJECTIVES

FoodWal, a pioneer initiative based in Wallonia, fosters collaboration among research stakeholders in the food system to drive innovation, sustainability and regional economic development. By addressing the key challenge of feeding future generations in a healthy and sustainable way, FoodWal proposes a systemic approach to achieving sustainable food for global health.

METHODS

FoodWal operates through a multi-stakeholder consortium that includes academia, research centres and industry partners and is supported by policymakers. By leveraging cutting-edge collaborative research and local knowledge, the initiative develops and implements three projects.

RESULTS

FoodWal's projects showcase impactful innovation in sustainable food systems:

1. MICROBoost develops sustainable innovations using microbiome to enhance food quality, including the development of advanced microbiotics and digital tools for personalised nutrition. It also evaluates microbiotic impacts on health.
2. PEPTIBoost develops innovative methods to produce and characterise bioactive peptides from protein-rich by-products and other alternative protein sources. It evaluates the health benefits of these peptides and develops AI tools to predict their properties and accelerate their discovery.
3. PROTEBoost aims at producing microbial proteins from food by-products and optimises processes to make them scalable while preserving nutritional quality of the biomass. It also formulates attractive, healthy and sustainable food products and develops digital tools for process optimisation and life cycle analysis.

CONCLUSIONS

FoodWal contributes to the broader goal of sustainable food systems by aligning regional priorities with global targets. Its replicable model of collaborative research offers valuable insights for other regions aiming at enhancing the sustainability and the resilience of their food systems.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

1. www.foodwal.be

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EPO4_029

EAT-LANCET DIET IMPLEMENTATION AND THE IMPORTANCE OF BUILT-ENVIRONMENT IN THE CONTEXT OF JAPAN: PRACTICE AT THE SCHOOL CAFETERIA

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BACKGROUND AND OBJECTIVES
EAT-Lancet diet had introduced as a healthy and sustainable diet both for human and planet. The evidence of its positive effect has been accumulating and the concept of EAT-Lancet diet is becoming more valuable and spreading mainly in Western countries. However, it is still novel concept in Japan and the adherence is remaining unclear because there is almost no research published about this topic in Japan as of 2022. So, we aimed at detecting the adherence to EAT-Lancet diet and exploring the motivator and bottleneck so as to spread the EAT-Lancet diet in Japan.

METHODS
This research was designed as the school-based participatory research and conducted consistently during February 2023 to the end of July 2024. It consists of 1)EAT-Lancet diet offering project at school cafeteria operated by registered dietitian, and 2)cross-sectional study using semi-structured questionnaire. Independent variables were basic demographic data, dietary habits, and the perception toward health and environment issues. Dependent variable was the adherence toward EAT-Lancet Diet. Focus group interviews was also adopted to explore the challenges from the providers' perspective.

RESULTS
We could collect both of the quantitative data and qualitative data from semi-structured questionnaire regarding to adherence to EAT-Lancet diet, motivator and bottleneck to spread EAT-Lancet diet in Japan. Overall, the concept of EAT-Lancet diet was positively precepted and the higher proportion of plant-based protein was positively accepted because of Japanese traditional food culture. On the other hand, it was shown that not a few participants were expecting not so much the benefits for the environment or health, but rather the effects of weight loss. From the focus group interview, potential driver and bottlenecks to expand EAT-Lancet diet outside the school cafeteria were suggested from the perspective of human and financial resource.

CONCLUSIONS
It was shown that the arrangement of built-environment with the appropriate nutrition education is inevitable together with introducing the concept of EAT-Lancet diet in Japan. Japan is known to be the country which has relatively higher proportion of thinness among young women due to the social pressure and desire for thinness. So, it seems to be inevitable to offer the proper occasion to educate them about ideal nutrition intake balance as well as EAT-Lancet diet. By doing so, we can move forward both of the human health and environmental health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_031

IRONING OUT THE FUTURE: HOW WILL SUSTAINABLE DIETS IMPACT IRON BIOAVAILABILITY?

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BACKGROUND AND OBJECTIVES
Iron is crucial for many metabolic processes, including oxygen transport via binding to haemoglobin. Deficiency is common (two billion people globally), previously described as “a major public health concern”. Haem iron from animal sources is the most bioavailable form of iron from the diet, however, is not environmentally sustainable. The bioavailability of non-haem iron from plant-based foods is complex and can be inhibited by the presence of bioactive compounds in the foods consumed. The aim of this research is to determine the bioavailability of non-haem iron from current and future sustainable UK diets. To do this we are integrating compositional information on modifiers of iron bioavailability within national dietary intakes.

METHODS
Levels of dietary bioactive compounds known to influence iron bioavailability, namely phytate and polyphenols (in tannin equivalents), were identified and mapped to the “electronic Bioactive Substances in Food Information System” (eBASIS/FoodBioactivesDB), which contains compositional information on plant-derived bioactives. Foods commonly reported in the National Diet and Nutrition Survey (NDNS) yrs 9-11 containing key iron bioavailability modifiers are being targeted for additional data input. NDNS (yrs 9-11) data was analysed to identify current iron status and key iron sources. In time, bioactive compound data alongside bioactive and nutrient data will be used to accurately examine iron bioavailability from current UK diets using a validated algorithm.

RESULTS
Phytate and polyphenols are major bioactive compounds inhibiting iron absorption, however availability of compositional data is limited. Foods containing tannin equivalents such as tea and coffee were widely consumed by the NDNS cohort (7% of total reported food items consumed). High phytate foods like legumes, unprocessed grains, nuts and seeds were less commonly reported (4%). Fortified breads and cereals were the largest contributor to total iron intake across all age groups in NDNS (38-53%), followed by meat and meat products (12-19%). Adolescent girls were most at risk for iron deficiency; 49% reported intake below the LRNI and 17% were below the threshold for serum ferritin (<10ng/mL). Young girls (aged 4-10 years) and women of reproductive age (19-49 years) were also at risk.

CONCLUSIONS
As transition to sustainable diets is inevitable, it is vital to predict bioavailability of non-haem iron intake. Future work will determine bioavailability of iron in the UK and apply diet modelling to inform plant-based food strategies which maintain adequate iron stores.

CONFLICTS OF INTERESTS
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EPO4_032

DISHI FITI ISHI FITI (EAT WELL, LIVE WELL): PRIORITIZING FOOD SYSTEMS INTERVENTIONS TO REDUCE ADOLESCENTS' NUTRITION INSECURITY AND MALNUTRITION IN LOW-INCOME KENYAN NEIGHBORHOODS

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BACKGROUND AND OBJECTIVES
Nutrition insecurity in low- and middle-income countries (LMICs) contributes to undernutrition, micronutrient deficiencies and obesity, creating "multiple burdens" of malnutrition that increase risk of diet-related non-communicable diseases. Adolescence is an optimal period for intervention before negative life-long patterns are established, yet few programs target this age group or consider the broader systems influencing adolescent food choices. Our mixed-methods study aims to address nutrition insecurity among adolescents in Nairobi, Kenya by investigating factors influencing their food choices and capturing the interplay between nutrition insecurity, food environments, and health outcomes using participatory systems thinking and modeling.

METHODS
To better understand perceived systems drivers of adolescent diets across formal and informal settlements in Embakasi South, Nairobi, our participatory systems approach engages with adolescents, parents, educators, and food systems stakeholders, through cognitive mapping and group-based modeling. The RESULTS of this work will inform the second stage of our study, a longitudinal cohort to link the neighborhood and household food environments to adolescent food choices and dietary and nutritional outcomes through discrete choice experiments, adolescent dietary assessments, anthropometric measurements, and Bayesian network modeling.

RESULTS
Free-listing activities with adolescents, parents/educators, and food systems stakeholders identified key factors that influence food choices among adolescents, including vendor hygiene and appearance, affordability, and taste. Decision-making is also influenced by the different settings in which they acquire food (e.g., at home, from street vendors, etc.). The relative salience of these factors differentially varied across the gradient of formality according to different stakeholder groups.

CONCLUSIONS
These findings, along with the RESULTS from our other study activities, will be used in modeling exercises to understand how modifiable characteristics of the informal versus formal environment affect adolescent food choices. They will also inform the ranking and prioritization of food systems interventions to reduce malnutrition and promoting better long-term health of adolescents into adulthood.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_034

DETERMINANTS OF IRON STATUS IN VEGANS LIVING IN NEW ZEALAND

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BACKGROUND AND OBJECTIVES
A vegan diet has many health benefits; however, nutrients such as iron are less bioavailable in plant food, presenting a risk for iron deficiency (ID). Research on iron intake and status in vegans is limited and has not been explored in New Zealand (NZ). This study aimed to investigate iron status in a NZ vegan population and explore risk factors for ID.

METHODS
Males (n=52) and females (n=143) over 18 years of age who had been vegan for at least two years were recruited. Nutrient intake was gathered through four-day food records. Biomarkers of iron status were measured including serum ferritin (SF), haemoglobin, serum iron, total iron-binding capacity and transferrin saturation. Health, demographic and lifestyle factors were assessed using questionnaires. Participants were grouped as ID (SF<30µg/L) and iron sufficient (SF≥30µg/L) and the differences between these groups were assessed using independent t-tests (for parametric data) or chi square test (for categorical data).

RESULTS
The prevalence of ID was 47.3% overall. Significantly higher rates of ID were found in females (58.7%) compared to males (15.4%) ($p \leq 0.001$). Mean±SD iron intake was above the estimated average requirement (EAR) for both females (17.2±5.2mg) and males (22.3±6.4mg). In females, ID was more likely in those who were younger ($p \leq 0.001$), those who had donated blood in the last six months ($p=0.025$), and in those who were still menstruating ($p=0.010$). No significant differences in nutrient intake were observed between ID and iron sufficient females. In males, energy ($p \leq 0.001$), protein ($p=0.004$), dietary fibre ($p \leq 0.001$), iron ($p=0.001$), calcium ($p=0.003$) and vitamin C ($p=0.006$) intake was higher in ID compared with iron sufficient males.

CONCLUSIONS
Nearly half of the vegan sample was ID, and over half of vegan females were ID. In females, being younger, donating blood in the past six months and still menstruating were more likely in those with ID. Dietary intake was associated with ID in males, however the sample size was small. This study has provided novel insights on the risk of ID for vegans living in New Zealand. Further research is needed to confirm these findings and to explore other aspects of dietary intake beyond just nutrient intake.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_035

VALIDATION OF THE CARBON ISOTOPIC RATIO AS A BIOMARKER OF ADDED SUGAR AND CORN INTAKE IN MEXICAN ADULTS

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BACKGROUND AND OBJECTIVES
Dietary assessment methods are susceptible to bias due to innate errors, so validating a biomarker of added sugar and corn intake may provide useful information in dietary analysis. The carbon isotopic ratio (13C/12C; CIR) has great potential as an added sugar and corn intake biomarker due to sugarcane and corn's natural abundance of 13C. Sugar-sweetened beverage (SSB) intake in Mexico is among the highest worldwide (163 L/per capita), while corn is the primary staple food (346 kg/per capita). Because of the high carbohydrate content in SSB and refined corn, there is concern about their relationship with obesity, CVD, and T2D. **Objective:** To evaluate the utility of CIR as a biomarker of added sugar and corn intake in Mexican adults.

METHODS
This one-month study includes 72 healthy, diet and weight-stable adults (37 women and 35 men, BMI ≥ 18.5 kg/m2, aged 18 - 50 y). At enrollment, information on lifestyle variables was collected through a questionnaire. Anthropometric measurements were performed weekly, and dietary intake was reported by four non-consecutive 24 four dietary recalls, three on different weekdays and one on weekends. Added sugar was estimated based on the 10-step methodology of Louie et al. (2015), and food variables were coded using the method described by O'Brien et al. (2022). Blood samples were collected at the end of the study period for biomarker analysis. Serum CIR was analyzed by coupled elemental analysis/isotope ratio mass spectrometry (EA-IRMS) at the Alaska Stable Isotope Facility at the University of Alaska Fairbanks.

RESULTS
The median (IQR) intake of added sugar, corn, and SSB was 55 g/d (30, 75 g/d), 111 g/d (77, 166 g/d), and 333 ml/d (113, 665 ml/d), respectively. Corn, animal protein, red meat, fish, SSB, and added sugar in SSB were significantly correlated with CIR ($p<0.05$). Multivariate regression analysis further confirmed the predictive value of corn and red meat, significantly impacting CIR ($R2= 0.187$).

CONCLUSIONS
These findings will provide valuable data to better understand the relationship between diet and cardiometabolic disease in Mexican adults.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_037

IMPACT OF SOYBEAN ENRICHED UGALI ON HEALTH MARKERS OF CHILDREN ATTENDING PRIMARY SCHOOLS RURAL TANZANIA

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BACKGROUND AND OBJECTIVES
Childhood Malnutrition, as well as micronutrition deficiencies, remains a public health issue in Tanzania, especially in rural areas. Stunting, wasting, or underweight are classified as malnutrition in respect to height or weight compared with age or to each other. Further, dietary insufficiency from reliance on a predominantly starch based diet as rural communities increasingly depend on staples such as tubers or cereals. Ugali refers to starchy porridge cooked by boiling raw casava or mixing casava flour to form viscous porridge, often served with sides or served as such depending on socio economic status of the population. The objective of the research was to measure the impact of feeding program in the form of soybean enriched Ugali on health markers, subjective markers and educational outcomes on first grade, ages 6 to 7 years old in rural Tanzania

METHODS
Six months Observational cross-sectional study was designed to measure the impact of feeding soybean enriched Ugali on objective/growth data (height, weight, BMI), subjective health markers (presence of diarrhea, symptoms of respiratory illness and health care access) and educational outcomes (attendance, attention, student engagement) among selected primary schools in rural areas. A baseline questionnaire to assess proxy variables of socioeconomic and health status preceded a six-month for first grade, n=114, 6- 7 year old children in rural Tanzania. Weight and height measures were obtained at regular intervals: baseline, midpoint, and final. Growth was the primary outcome to assess impact of the feeding period.

RESULTS
Multiple linear regression modeling for weight velocity, when controlling for age and gender, shows coughing and flu symptoms as the variable that best explains variance in weight velocity at a significance of $p = 0.009$. Further research is needed to assess a longer period of time, with a causal or experimental design including a control group, in order to investigate stronger evidence.

CONCLUSIONS
A typical school day in this region is approximately a twelve-hour day at school where meals are not served until the child returns home for an evening meal. The feeding program such as soybean enriched Ugali will increase educational outcomes, bring positive health outcomes, towards reduction in chronic malnutrition among children attending in rural areas lacking access to government school feeding programs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_038

SOCIO-DEMOGRAPHIC, SOCIO-POLITICAL AND ENVIRONMENTAL FACTORS ASSOCIATED WITH FOOD INSECURITY OF HOUSEHOLDS WITH CHILDREN UNDER 3 YEARS OF AGE IN HIGH ANDEAN AREAS IN THE CONTEXT OF A SOCIAL AND POLITICAL CRISIS

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BACKGROUND AND OBJECTIVES
The high Andean areas of the LMICs have a high prevalence of childhood anemia in children aged 6 to 35 months, and food insecurity. Added to this are environmental factors such as climate change that affect their productive potential for access to food. The objective was to evaluate the demographic, sociopolitical and environmental factors associated with food insecurity in households with children under 3 years of age in high Andean areas in the context of a social and political crisis in a low-income country

METHODS
Cross-sectional correlational study that involved 330 households of children under 3 years of age attending health facilities in Andean area. Food security at the household level was measured using the FAO FIES instrument. A previously validated survey on the factors studied was applied. Univariate, bivariate, and multivariate analysis was done in R software, version 4.0.2.

RESULTS
Almost all (97%) households assessed were food insecure, with severe food insecurity prevailing. From the multivariate analysis, the socio-demographic factor related to the educational level of the head of household was a protective factor against moderate-severe food insecurity, (OR=0.16; 95% CI 0.03-0.98). Socio-political factors showed that households that experienced difficulties in accessing food due to the socio-political crisis were 1.52 times more likely (OR= 2.52; 95% CI 1.02-6.25) to experience moderate-severe food insecurity; households that lost income during the socio-political crisis were 3.1 times more likely to experience moderate-severe food insecurity (OR= 4.10; 95% CI 1.96-8.60). No environmental factors associated with moderate-severe food insecurity were identified.

CONCLUSIONS
The educational level of the household head had a protective effect against food insecurity. Also, difficulties in access and loss of income were risk factors for moderate-severe food insecurity in households with children under 3 years of age in high Andean areas in the context of a social and political crisis in Peru.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_039

NECSCORE: A CO-CREATED NUTRITION-ENVIRONMENT-CULTURE PROFILING SYSTEM FOR PROMOTING YOUTH ENGAGEMENT ON TRADITIONAL RECIPES FROM INDIGENOUS FOODS

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BACKGROUND AND OBJECTIVES
Traditional recipes possess significant cultural value as they are deeply rooted in the geographic context, historical heritage, and identity of populations. Additionally, these dishes are often nutritious and can be produced sustainably. Despite significant potential to positively contribute to healthy and sustainable diets globally, traditional dishes are increasingly being displaced by more convenient and processed alternatives. Youth could play an important role in re-popularizing traditional recipes. Our goal was to co-develop and test a simple profiling system in collaboration with youth, called the Nutrition-Environment-Culture Score (NECScore). The NECScore is intended to help youth re-discover the value of traditional dishes and reflect on strategies to further enhance it.

METHODS
Eight youth leaders from the global ACT4FOOD movement shared examples of traditional recipes from their countries of origin, including pictures and detailed descriptions of ingredients, preparation methods, and personal and cultural significance. The research team supplemented these descriptions with online searches when necessary. Based on this information, we developed dish profiles with key messages about nutritional value (considering the list of ingredients and their proportions), environmental impacts, and socio-cultural characteristics. As a following step, we conducted a co-design session with youth leaders to create visual cues representing the three attributes outlined in dish profiles.

RESULTS
We developed profiles for 18 culturally diverse dishes from eight countries. While some of these were nutritionally balanced and relatively sustainable meals, others were primarily starch-based or meat-based, offering opportunities to enhance diversity and lower environmental footprints by incorporating other food groups. All analysed dishes were associated with values of connectedness, family/community, and belonging, as they are often prepared for special occasions and tied to shared memories. The visual cues co-designed with youth featured a three-star rating system for each of the attributes. Overall, youth leaders demonstrated enthusiasm and active engagement throughout the process.

CONCLUSIONS
CONCLUSIONS:
The profiling system holds promise as a tool for engaging and collaborating with youth around traditional recipes. As next step, we will test and refine the NECScore with youth.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_040

TRANSFORMING FOOD SYSTEMS FOR IMPROVED NUTRITION: WHAT DRIVES THE CONTAMINATION OF NUTRIENT-RICH FRUIT AND VEGETABLES IN EAST AND WEST AFRICA AND HOW CAN THIS BE ADDRESSED?

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BACKGROUND AND OBJECTIVES

Demand for nutrient-rich fruits and vegetables (F&V) is increasing, due to demographic growth and health awareness. As a result, F&V supply chains are becoming longer and more complex, adding food safety challenges in sometimes fragile production and monitoring systems. Foodborne illnesses caused by contaminated F&V can reduce the positive impact of F&V. This research aims to understand better the levels and drivers of F&V contamination to propose strategies for food systems transformation to provide healthier diets.

METHODS

We reviewed existing frameworks to develop a bespoke F&V framework bringing together contaminant entry points and influencing factors, and the informal nature of African markets. This was completed through an iterative process with the evidence from a scoping review, and validated by expert panel advice. We also conducted an umbrella review to examine regional trends in East and West Africa and evidence gaps, and a zoom in scoping review at each region. We conducted a short survey among authors of eligible publications to compile additional information on the protocols followed, and accreditation processes of the laboratories, and assess the quality of the available evidence and some of the challenges.

RESULTS

Our comprehensive framework will allow implementers/policymakers gain a better understanding of F&V food safety, and how it links with nutrition. Geographical representativity of the 23 reviews was limited. Informal markets supplying the most nutritionally vulnerable households, are under-researched. Factors driving the contamination were not often mentioned but included climatic and environmental conditions, farming systems, processing and storage techniques, and socio-political factors. Significant evidence gaps include environmental hygiene, infrastructure, or services in outdoor food markets. Regulation, control and enforcement remain inadequate, particularly in relation to smallholders and informal chains. The contamination of various hazards such as pesticides and heavy metals along F&V supply chains often exceeds accepted levels. More systematic assessment is needed to understand which supply chains are more prone to contamination and the influencing factors.

CONCLUSIONS

While F&V are very nutritious, there are significant trade-offs with their susceptibility to contamination. Our findings underscore the need for evidence to address critical issues to transform East and West Africa F&V value chains, especially within the informal sector, and make them suitable to supply healthy and sustainable diets.

CONFLICTS OF INTERESTS

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EPO4_041

ASSOCIATION BETWEEN DIETARY IRON INTAKE AND VITAMIN D STATUS: POST-HOC ANALYSIS OF THE D2-D3 STUDY

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BACKGROUND AND OBJECTIVES

Vitamin D and iron deficiencies are global public health concerns; improving micronutrient sufficiency could help to reduce incidences of preventable diseases symptomatic of deficiency, such as, osteomalacia or anaemia. However, the extent to which these micronutrients interact is little understood. The aim of this research was to determine whether (baseline) dietary iron intake is related to dietary vitamin D intake and/or serum vitamin D concentrations.

METHODS

Post-hoc analysis of the D2-D3 Study dataset (a 12-week randomised, placebo-controlled food-fortification trial) was conducted using IBM SPSS Statistics (2024) [1,2]. Dietary intakes were compared to UK RNI data and bivariate correlations were performed to investigate associations between dietary iron intake and vitamin D intake/status at baseline.

RESULTS

Descriptive analysis showed that the median dietary intake of vitamin D was 1.99 [1.21-3.57] µg/day for all participants, well below the RNI of 10µg. The median [IQR] dietary intake of iron across all participants aged >50 years was 11.34 [9.38-13.62] mg/day, which is above the UK RNI of 8.7mg. However, for participants aged 19-50 years, the median intake was 3.86mg, well below the RNI of 14.8mg, at 10.94 [8.73-13.71] mg/day. Baseline dietary iron (mg) and vitamin D (µg) intakes were significantly positively correlated across all participants ($rs(260) = 0.399$, $p = <0.001$). No significant correlation between pre-intervention serum vitamin D concentrations (nmol/L) and baseline dietary iron intake (mg) was found for the sample as a whole.

CONCLUSIONS

Whilst data analyses found a significant positive association between dietary iron and vitamin D intakes, there were no apparent associations between dietary iron intake and vitamin D status. To ascertain cross-sectional/longitudinal associations between baseline, 6- week, and 12-week serum iron and vitamin D concentrations, we aim to continue post-hoc analysis of the D2-D3 dataset to investigate whether there are positive increases in iron biomarkers following vitamin D supplementation, compared to control.

CONFLICTS OF INTERESTS

EB, AD, RE, IG, JH and KH declare no conflicts of interest. SLN reports being a member of the main HM Government Scientific Advisory Committee on Nutrition (SACN) Committee (2010 to present) and the SACN Vitamin D Working Group (2010-2016; 2022-present) and also the European Food Safety Authority (EFSA) Committee on the Tolerable Upper Limit for Vitamin D (2021-2023). SLN is a Research Director of the D3Tex Ltd which holds the UK and Gulf Corporation Council Patents for the use of UVB material for combatting vitamin D deficiency in women who dress for cultural style. JL is Deputy Chair of SACN.

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EPO4_044

STRENGTHENING AND RESTORING TRADITIONAL INDIGENOUS FOODWAYS FOR HUMAN AND PLANETARY HEALTH: CASE STUDIES FROM THE CENTER FOR INDIGENOUS INNOVATION AND HEALTH EQUITY

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BACKGROUND AND OBJECTIVES

Food sovereignty, the rights of Indigenous peoples to determine their own food systems, is a culturally centered movement rooted in traditional Indigenous knowledge. While food sovereignty initiatives can be found within many Indigenous communities, the conceptual linkages between food sovereignty and health have not been well documented within the public health literature. We present case studies of food sovereignty initiatives developed as part of the Center for Indigenous Innovation and Health Equity (CIIHE) initiative, a community–academic partnership with the goal of strengthening Indigenous food systems and practices to promote health and well-being.

METHODS

The CIIHE is a community–academic initiative between Oklahoma State University, the University of Hawai‘i, and American Indian, Alaska Native, Native Hawaiian, and Pacific Islander communities. Participatory Indigenous research and evaluation strategies are used to uplift and implement food sovereignty interventions and assess the impact of these interventions on community health. The efforts are driven by supporting the transmission of intergenerational knowledge and strengthening and restoring relational responsibilities among Indigenous peoples, food, and land. Ten communities across the US are implementing and evaluating food sovereignty interventions in rural, reservation, and urban communities. Process and findings will be shared as part of this presentation.

RESULTS

Innovative food sovereignty initaitives developed include a cultural foods and healing camp for elders in Fairbanks, Alaska, as well as a traditional Indigenous foods gathering in Anchorage, Alaska; a community supported agriculture initiative and mobile market in Osage Nation reservation in Oklahoma, as well as an Indigenous food hub in Quapaw Nation, Oklahoma; and a restoration of traditional heirloom seeds from the Trail of Tears forced removal of Choctaw tribal members in the Choctaw Nation of Oklahoma. The Yurok Tribe in Northern California is restoring their traditional food villages. These and other examples will be shared.

CONCLUSIONS

Settler colonialism disrupted traditional Indigenous foodways and practices and created high rates of diet-related disease among Indigenous peoples. This approach directly intervenes upon systems-level barriers to health, making it an important strategy for health equity.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO4_045

FOOD ENVIRONMENTS AND GLOBAL SYNDEMIC: A BIBLIOMETRIC ANALYSIS OF CURRENT LITERATURE

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BACKGROUND AND OBJECTIVES
We are currently facing a global syndemic, consisting of the interconnected pandemics of obesity, undernutrition, and climate change, which both affect and are driven by food systems. Within this context, food environments serve as the interface where consumers interact with the food system, shaping individual food choices and nutritional status. However, there are still gaps in understanding the interaction between food environments and this syndemic. This study aims to investigate how the literature has explored the relationship between food environments and the global syndemic.

METHODS
This work involves a bibliometric analysis of original articles published between 2018 and 2024 with a search strategy that combines terms related to food environments, and undernutrition, obesity, or climate change in titles, abstracts, and keywords. Publications specifically focused on pregnant women or associated with diseases were excluded.

RESULTS
The search resulted in 4,068 findings, of which, after removing duplicates and non-original articles, 1,607 were analyzed by title. Only 283 studies were deemed suitable for analysis based on the abstract. Of these, 221 were considered eligible for inclusion in this research.
Regarding the syndemic variables, approximately 72% of the papers (160 articles) focused exclusively on the connection between food environments and obesity, while 17% (37 articles) addressed the relationship between food environments and undernutrition, and only 2% (4 articles) explored links with aspects related to climate change. Additionally, some works examined more than one component of the global syndemic: 18 discussed obesity and undernutrition, 1 explored malnutrition and climate change, 1 obesity and climate change and none addressed all three synergistic pandemics.

CONCLUSIONS
There is a predominance of studies linking food environments to obesity, reflecting greater scientific interest in these interactions. However, few articles explore associations between more than one pandemic, and even fewer address climate change. Therefore, this work highlights a significant gap in the literature regarding the impacts of food environments on the global syndemic and highlights the need for integrated approaches that include these components to mitigate such critical challenges affecting many parts of the world.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_046

REPRESENTATION OF THE DEGREE OF FOOD PROCESSING IN DIETARY QUALITY INDICES

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BACKGROUND AND OBJECTIVES
Recent meta-analytical evidence suggests that a higher degree of food processing is linked to adverse health outcomes 1–4. While dietary quality indices (DQI) are widely used to assess diets, it remains unclear to what extent they capture food processing. This study aims to qualitatively analyse how DQIs consider variations in food processing within and across food groups and how these variations are scored.

METHODS
The current state of knowledge about the influence of the degree of food processing on health was identified from synthesis of systematic reviews and meta-analyses (i.e. umbrella reviews). Based on this, four criteria were developed to evaluate the extent to which DQIs consider this knowledge for scoring diets. The Global Diet Quality Score (GDQS)5, the Alternate Healthy Eating Index 2010 (AHEI 2010)6, Probability of Adequate Nutrient Intake (PANDiet)7, Plant-based Dietary Index (PDI), Healthful PDI (hPDI), and Unhealthful PDI (uPDI)8 were selected for the analysis. The NOVA classification 9 was used to categorise the degree of food processing in which the foods included in a DQI could theoretically fall.

RESULTS
In the GDQS, AHEI-2010 and PDI, the food groups that score negatively fall almost exclusively into the processed and ultra-processed categories. The exceptions are potatoes/white roots and tubers, juices; and animal-based foods in the PDI. In contrast, food groups that score positively can span multiple processing categories and thus receive the same number of points regardless of their processing level (e.g. legumes and whole grains). Notably, in the GDQS and AHEI-2010, fruits scored positively only when consumed as whole food. The GDQS captured the most nuances of processing variation, partly due to its larger number of food groups; while the PANDiet captured the least (as it is based on nutrients). Changes in the food matrix were only considered in the GDQS for the fruit group, while changes in nutrients were not directly considered in any, but are reflected, for instance, by differentiating refined from whole grains.

CONCLUSIONS
Although the indices do not explicitly include food processing as a factor, they still reflect some of the current knowledge about the association between food processing and health, especially for food groups considered as unhealthy. Next to the coverage of unhealthy food groups, the indices could need refinement to distinguish the food processing within all food groups. If food processing is to be evaluated, it is recommended to use a processing classification system in addition to the DQIs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_047

FOOD SUPPLY AND SUSTAINABILITY: TÜRKIYE'S COMPLIANCE WITH THE PLANETARY HEALTH DIET

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BACKGROUND AND OBJECTIVES
The world's growing population, climate change, depletion of natural resources, and emerging nutritional challenges have increasingly underscored the importance of sustainable and healthy dietary approaches. Within this context, global recommendations such as the "Planetary Health Diet" (PHD) address both ecological and human requirements holistically. This study aims to determine and evaluate the extent to which the food supply available for human consumption in Türkiye meets the components of the PHD.

METHODS
To determine the per capita food supply, the number of stakeholders benefiting from the country's food availability—including residents, those under refugee status, and tourists—was calculated. Utilizing official governmental reports and food balance sheets, the per capita food supply for human consumption was established. Subsequently, the alignment of this per capita food supply with the PHD recommendations was assessed by examining how well the recommended components are met, thereby evaluating the current food supply's capacity to fulfill sustainable dietary guidelines.

RESULTS
The findings indicated that the food supply for whole grains, tubers or starchy vegetables, all vegetables, all fruits, red meat, poultry, and eggs meets the PHD recommendations. However, the supply of dairy foods, fish, legumes, and nuts was found to be insufficient. Additionally, the availability of added sugars significantly exceeded the levels recommended by the PHD.

CONCLUSIONS
The RESULTS suggest that achieving a sustainable and healthy dietary pattern aligned with PHD recommendations in Türkiye requires a comprehensive re-evaluation of policies related to production, distribution, consumption, and waste management. In particular, to ensure sustainable food security and to compensate for the current reliance on animal-based protein sources, there is a need for policies that increase the supply of dairy foods, fish, legumes, and nuts.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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LEGUMES IN THE DIET: ASSESSING THE GAP BETWEEN CURRENT CONSUMPTION AND 2050 SUSTAINABILITY SCENARIOS – THE FRENCH CASE

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BACKGROUND AND OBJECTIVES

The transition of food systems towards higher share of plant-based products is considered one of the most important strategies to achieve carbon neutrality and reduce the overall environmental pressures of agriculture by 2050. These diets must also meet human nutritional requirements and promote health. Several international and French scenarios predict an increase in the proportion of plant-based foods in diets, especially legumes. However, legume consumption remains low in France, highlighting the need for research to overcome barriers and increase interest in their consumption, particularly in some western countries. The goal of the consortium is to assess how much the proportion of legumes in the French diet can increase and what the potential impact on the entire legume supply chain (from production to consumption) might be expected at the agronomic and nutritional levels. This began with a critical evaluation of the current legumes consumption (in various forms) in the french diet.

METHODS

The Legumic consortium, established in 2023 and funded by INRAe metaprograms, brings together academic and interprofessional partners with complementary expertise in agronomy, ecology, ecophysiology of legumes, nutrition, sensory analysis and consumer behavior. An analysis of the consumption and purchase of legumes by the French population was conducted using French surveys (INCA3, Esteban, Nutrinet). These data were compared with the projections for 2050 proposed by French and European scenarios (TYFA, Afterres, SISAE) aimed to promote a healthy and sustainable diet.

RESULTS

The analysis of legume consumption data shows variations across different categories (e.g. diet type, age, gender). However, overall legume consumption in France remains very low. Furthermore, there are important differences between low and high legume consumers (with a factor 10 or more). All scenarios for 2050 predict an increase in the share of legumes in the diets. The analysis of the current French legume consumer panel, along its variability may provide insights into new approaches to increase share of legumes in the French diet.

CONCLUSIONS

Data from various dietary surveys show a high diversity in the profiles of legume consumers. The substantial increases in legume consumption recommended by the scenarios raise the question of potential levers to make legumes more attractive in the French diet. Currently, working groups within the Legumic consortium are exploring strategies to increase the share of legumes in the French diet, considering agronomic, ecological and nutritional constraints.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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PROBIOTIC BIOPOLYMER-BASED CAPSULES: NEW PERSPECTIVES IN DIETARY SUPPLEMENT DEVELOPMENT

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BACKGROUND AND OBJECTIVES

Due to its exceptional encapsulation capabilities, biopolymers have found extensive applications in the development of pharmaceuticals and biomedical systems. Studies have shown that encapsulation in natural polymers is an excellent method for preserving the stability and viability of various compounds, such as probiotics [1], vitamins [2], polyphenols [3], and drugs [4]. This study aims to assess the feasibility of encapsulating probiotic strains of Lactobacillus clausii within biopolymeric matrices composed of sodium alginate and starch. The proven drug encapsulation efficiency of alginate, combined with starch's role in capsule production, its swelling and solubilization properties, affordability, and versatility, offers a robust basis for creating formulations designed for the targeted and controlled release of active substances.

METHODS

Capsules developed through the extrusion method, containing Lactobacillus clausii and the control samples (non-encapsulated lyophilized probiotics), were tested to determine cell viability, encapsulation efficiency, and production yield. The physical evaluation of the capsules included microstructure, diameter, and color evaluation. The in vitro digestion behavior in simulated gastrointestinal fluids was assessed to determine the survival rate of the probiotic strains.

RESULTS

The encapsulation of Lactobacillus clausii in biopolymeric matrices enhanced the viability and stability of probiotic cells compared to the strains used as control samples. The capsules presented spherical shape, free of pores or fissures in the matrix, but with an irregular surface. The color showed slight variations. The probiotic strains were protected in gastric fluids and released into intestinal fluids at 0.5 hour after immersion. The highest swelling index was observed in the formulation with the highest starch content, while the lowest swelling index was found in the formulation with a higher sodium alginate content.

CONCLUSIONS

Encapsulation enhanced the stability and viability of probiotic strains during exposure to simulated gastrointestinal juices. The addition of starch in the matrix enhanced the swelling of the capsules and aided in their disintegration. Future studies involve adding the capsules to natural yogurt and checking the parameters (cell viability, acidity, syneresis, water holding capacity) over a 2-week storage period.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EVALUATING THE NATURALNESS OF 'NATURAL' LABELED PRODUCTS AND THEIR ALIGNMENT WITH CONSUMER EXPECTATIONS IN TERM OF NATURALNESS AND HEALTHINESS

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BACKGROUND AND OBJECTIVES
Natural claims are increasingly prevalent in the Swiss and global markets. However, the term ‘natural’ lacks a clear definition in the food industry, leading to potential consumer misinterpretation due to positive associations with health. The term is only regulated by a global standard, which is not binding. Food companies overuse the term ‘natural’ because of its positive association. However, are foods labeled as ‘natural’ more natural? Are they perceived as more natural and thus due to the heuristic effect healthier?

METHODS
This study aimed to assess these two questions in two parts. Firstly, this study looked at food items from the most popular food categories (“Desserts & Ice Cream”, “Meals & Meal Centers”, “Sauces & Seasonings”, “Snacks” and “Soups”) with a ‘natural’ claim available on the Swiss food market from 2019 to 2023. The Food Natural Index (FNI), developed by Sanchez-Siles et al. (2019), was calculated for these foods through ingredient analysis and then compared to foods that did not have a "natural" label.
In a second phase of the study, an online questionnaire was used to assess perceptions of naturalness and healthiness associated with foods with and without a 'natural' label.

RESULTS
The RESULTS of the first study indicate that products labeled "natural" had a significantly higher FNI than their unlabeled counterparts. RESULTS of the second study revealed that consumers perceive products labeled as “natural” to be more natural and healthier, and the perceived naturalness of two food items (i.e., natural labeled or unlabeled) had a full mediation effect on participants' perceived of healthiness.

CONCLUSIONS
The study found that the unregulated use of the "natural" label does not directly mislead consumers. However, since perceived naturalness fully mediates the relationship between labeling and perceived healthiness, it may cause consumers to rely on heuristics rather than objective information, such as ingredient lists or nutritional content, leading to biased judgments and decisions regarding food healthiness.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_055

LONG-TERM IMPACT ASSESSMENT OF A NUTRITION-SENSITIVE AGRICULTURAL INTERVENTION AMONG ADULTS IN RURAL SRI LANKA

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BACKGROUND AND OBJECTIVES
In 2020, a WFP Food Assistance for Assets (FFA) program (R5N) was implemented in rural Sri Lanka to address the vulnerability of smallholder farmers to climate shocks and nutrient insecurity. Over 12 months, R5N provided cash for work on community assets or productive assets to vulnerable households to support livelihood development and associated training. Some of the targeted communities were randomly selected to also receive a health promotion process (HPP) to support diet, nutrition, and health practices. Our aims were to compare the long-term impact on usual micronutrient intakes and diet quality among adults in the 1) R5N-only, 2) R5N+HPP), and 3) control groups.

METHODS
We analyzed the intervention's impact 2 and 3 years after baseline. Sociodemographic and dietary data were collected using household surveys and phone-based 24-hour recalls (N=1283 at baseline). We collected repeat recalls from 44-92% of participants. The National Cancer Institute method with bootstrap standard errors was used to estimate mean usual intakes and the prevalence of inadequate micronutrient intake, and to compare between groups. The Global Diet Quality Score (GDQS) was used as an indicator of diet quality.

RESULTS
The control group included older, more educated, and more male participants than the intervention groups ($p<0.01$). In the propensity score-matched analyses, energy intake was significantly lower in the control, R5N-only, and combined R5N groups at 3 years compared to baseline ($p<0.01$), while the R5N+HPP group reported no change. For 9 of the 11 micronutrients analyzed, the prevalence of inadequacy was ≥50% at all time points in all study arms. In the full sample and among women, there were no significant differences in differences (DIDs) in usual nutrient intakes or the prevalences of inadequacy at 2 or 3 years. Among men, the R5N+HPP group experienced small but significant protective effects on energy, carbohydrate, calcium, niacin, and zinc intakes relative to the control and R5N-only groups. The only significant DID in GDQS was among women in the combined R5N group vs. control comparison (all-R5N: -0.6 points, control: -0.4 points [$p=0.04$]).

CONCLUSIONS
A 12-mo. nutrition-sensitive FFA program had limited long-term impacts on dietary intake. The findings indicate the potential for nutrition-sensitive FFA programs to have positive impacts on diets; however, program design and/or implementation must be strengthened to confer greater benefits across both men and women, especially considering the compounding negative impacts of multiple shocks experienced during the study period.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EXPLORING THE BENEFITS AND TRADE-OFFS OF ALTERNATIVE PROTEIN SOLUTIONS

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BACKGROUND AND OBJECTIVES
Plant-based diets are becoming increasingly popular. However, there is still much to uncover about their nutritional value and molecular composition compared to omnivorous diets. This also applies to the metabolic health effects of plant-based diets, where differences may be associated with different molecular diversities between plant-based and omnivorous diets. The present study aims to evaluate the molecular composition and metabolic effects of the two diets through untargeted metabolomics and proteomics analyses of food and human plasma samples.

METHODS
In this project, samples from two human randomized cross-over intervention trials are used. In the first trial, 34 older adults followed an isonitrogenous and isocaloric vegan and omnivorous diet for 10 days each, and blood samples were taken at 3 time points (0, 10 and 20 days). The second trial focused on the post-prandial metabolic response to an isonitrogenous and isocaloric vegan and an omnivorous meal in 16 participants, where blood samples were collected across 15 time points (t= −180, −120, −60, 0, 15, 30, 45, 60, 90, 120, 150, 180, 240, 300, and 360 min). Food and blood samples were analysed using untargeted metabolomics and proteomics tools.

RESULTS
This project will reveal distinct signatures in vegan meals and diets by metabolomic and proteomic profiling, including unique nutrient and anti-nutrient profiles. By comparing the metabolomic profiles of the meals and plasma samples, we hope to identify novel biomarkers of nutritional exposure to plant-based proteins and understand the health benefits or challenges associated with plant-based foods. Ultimately the food and plasma profiles will be linked to health effects. The RESULTS will be available by the time of the conference.

CONCLUSIONS
With this project we aim to demonstrate the health impacts of vegan meals and diets by applying advanced metabolomics and proteomics platforms. By using omics techniques we will generate impactful findings that support the optimization of plant-based diets for better health outcomes. The integration of food and plasma analysis will help to understand the health effects of diverse plant-based foods, contributing to the development of evidence-based dietary recommendations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_057

LEVEL OF ACCURATE INFORMATION OF LARGE LANGUAGE MODELS ON ENTERAL NUTRITIONAL SUPPORT

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BACKGROUND AND OBJECTIVES
Large language models (LLMs) present a novel approach to information retrieval. In this study, we sought to evaluate the accuracy of two open-source LLMs, namely Gemini and ChatGPT, in the context of enteral nutritional support.

METHODS
The present study was conducted using a test consisting of 10 questions derived from the ESPEN Enteral Nutrition Guidelines. The subjects of the study were the Gemini 1.5 and ChatGPT 4.0 models, which had been trained with the aforementioned guide. The subjects were presented with the questions in a random order, and their cookies had been cleared. Each correct answer was assigned a value of 1 point, while each incorrect answer received a value of 0 points. The collected data were then subjected to statistical analysis using the SPSS software.

RESULTS
The two models under consideration both demonstrated an accuracy rate of 80%. A subsequent analysis revealed that there was no statistically significant difference in the meansuccess rates (p>0.05). The models demonstrated comparable performance, particularly in the domain of clinical nutrition.

CONCLUSIONS
While Gemini and ChatGPT have demonstrated proficiency in providing reliable information on enteral nutrition, existing open-source systems require enhancement. These findings underscore the promise of LLMs as clinical decision support tools.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_059

ASSOCIATION OF HEALTHFUL DIET PATTERN ADHERENCE WITH RISK OF INSOMNIA AMONG ADULTS: A LARGE-SCALE LONGITUDINAL STUDY USING GUANGZHOU BIOBANK COHORT STUDY

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BACKGROUND AND OBJECTIVES
Adherence to healthful diet patterns, such as the Dietary Approach to Stop Hypertension (DASH), the Mediterranean-dietary (MIND), and the planetary-health diets (PHD), has been widely recognized as being associated with a multitude of health-related outcomes. However, the existing body of research, particularly longitudinal analyses, is limited in reporting whether these diets serve as significant behavioral determinants of insomnia. Against this backdrop, the current study was designed with the aim of delving into the intricate relationship between adherence to these three diet patterns and the risk of insomnia among Chinese adults.

METHODS
This prospective cohort study harnessed data from the Guangzhou Biobank Cohort Study (GBCS). A total of 30,518 participants were initially recruited between 2003 and 2008, and subsequently, 18,104 participants had their sleep information re-assessed via self-reported questionnaires from 2008 to 2012. The DASH, MIND, and PHD scores were meticulously derived using a comprehensive food frequency questionnaire (FFQ), with higher scores signifying a greater degree of adherence to these dietary patterns. Participants were then stratified into three distinct groups based on the tertiles of their dietary scores. To evaluate the association between the DASH, MIND, and PHD dietary patterns and insomnia, we employed logistic regression analysis, utilizing both crude and adjusted models.

RESULTS
Initially, a total of 5,168 participants reported experiencing insomnia at baseline. After a follow-up period of 4.1 years, an additional 5,285 cases of insomnia were identified. Upon adjusting for common confounders such as sex, age, education, occupation, income, body mass index (BMI), systolic blood pressure (SBP), diastolic blood pressure (DBP), glucose levels, physical activity, smoking habits, and alcohol consumption, we found, compared to the lowest PHD tertile group, participants in the highest tertile exhibited a significantly lower risk of insomnia, with an odds ratio (OR) of 0.83 and a 95% confidence interval (CI) ranging from 0.76 to 0.91 (P value< 0.001). Similarly, the middle tertile group also demonstrated a reduced risk, with an OR of 0.93 and a 95% CI of 0.85 to 1.00 (P value=0.05). However, in contrast, the DASH and MIND scores did not exhibit any significant association with the risk of insomnia (all P value> 0.05).

CONCLUSIONS
There is a significant inverse longitudinal association between adherence to PHD dietary patterns and insomnia. Further studies are required to reveal the mechanisms.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

1. Association between diet and sleep quality: A systematic review
2. Association of Healthful Plant-based Diet Adherence With Risk of Mortality and Major Chronic Diseases Among Adults in the UK
3. Plant-based and planetary-health diets, environmental burden, and risk of mortality: a prospective cohort study of middle-aged and older adults in China

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EPO4_060

PROTEOMICS INSIGHT INTO NUTRIENT RETENTION OF UNDERUTILIZED LEGUME: “A CASE STUDY OF BAMBARA GROUNDNUT (VIGNA SUBTERRANEA)”

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BACKGROUND AND OBJECTIVES
Malnutrition, including protein and micronutrient deficiencies, remains a significant public health challenge in developing countries due to food insecurity, poverty, and dependence on staple crops. Research has shown that promoting underutilized legumes within food systems can enhance access to nutritious foods and foster healthier and more sustainable diets. Bambara groundnut (BGN) is a Drought-tolerant, underutilized legume rich in antioxidants and considered a complete food due to its diverse nutrient profile. However, one challenge is its hard-to-cook phenomenon, which limits its utilization and consumption. Therefore, this study investigated proteins and biochemical pathways associated with cooking in Bambara groundnut to enhance its nutritional benefits.

METHODS
Bambara groundnut accessions were boiled for 60 minutes and then pulverized into a fine powder using standard Laboratory techniques. Protein was extracted from the selected accession's uncooked and cooked Bambara groundnut. Protein profiling was done using a combination of Bradford assay, SDS-PAGE, and liquid chromatography-tandem mass spectrometry methods.

RESULTS
The SDS-PAGE analysis RESULTS show that cooking did not degrade all the proteins, while the spectrometry analysis revealed 1,970 proteins, with 251 proteins showing differential expression for the cooked samples. Additionally, 1,376 proteins were consistently quantified, with 153 exhibiting significant differences between boiled and uncooked samples. Principal Component Analysis (PCA) confirmed distinct clustering of boiled samples, with a clear separation between the Cooked and Uncooked groups forming a separate cluster.

CONCLUSIONS
These findings show that although nutrient degradation occurs, significant nutrient retention occurs. This provides insights into optimizing cooking methods to preserve the nutritional integrity of Bambara groundnut.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_061

THE NUTRITIONAL VALUES OF A TRADITIONAL SOURDOUGH BREAD

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BACKGROUND AND OBJECTIVES

Carbohydrates, of which bread is a major source, account for 50-55% of daily energy intake. Their impact on health depends on the quantity ingested and their quality, assessed using indicators such as the glycaemic index (GI), glycaemic load, fibre (type and content) and minerals. To ensure a high-quality carbohydrate intake, recommendations limit high-GI breads (>70), such as standard white bread, made from refined flour and industrial yeast. Moreover, this type of bread has a low fibre and mineral content. However, using wholemeal flour and an increase in fiber are not enough to reduce the GI. In fact, it depends on factors that cannot be considered separately. These include the variety of wheat, the type of milling, and consequently the type of flour, as well as the fermentation method. The aim of this study was to assess the carbohydrate quality of a bread made from wholemeal flour of old durum wheat, fermented with natural sourdough, by measuring its fibre and mineral content and quantifying its GI.

METHODS

Analyses of total fibre composition (enzymatic method MI MUNO85) and minerals (phosphorus, calcium, iron, copper, zinc, magnesium, manganese and potassium, method MI MUNO05-ICP-OES) were performed by Capinov laboratory (Landerneau, France). The GI of bread was measured (1) *in vitro*, through the quantity of glucose released following a digestion simulation including the oral, gastric and intestinal phases (adapted from COST INFO GEST 2019) and (2) in a clinical study, by monitoring the blood glucose levels of 11 healthy individuals for 2 hours after consumption of the bread (ISO standard). The level of resistant starches was measured and compared with that of an industrial-type white bread.

RESULTS

Our RESULTS show that this bread contains more total fibres than an industrial-type white bread (5.9 vs. 3.8 g/100g) and is also richer in minerals, particularly iron (24.7 vs. 12.5 mg/kg), zinc (31 vs. 7.5 mg/kg), manganese (17.1 vs. 6.7 mg/kg) and magnesium (2530 vs. 277 mg/kg). Our RESULTS also show that the GIs of this experimental bread are 47.2 and 48.6 respectively for the in vitro and in vivo studies, and that the level of resistant starch is 5 times higher than that of a traditional bread fermented with sourdough.

CONCLUSIONS

In conclusion, this type of bread could form part of the diet of individuals who need to control their diet, as in the case of diabetes for example, or in the context of a preventive diet.

CONFLICTS OF INTERESTS

Pane Vivo financed the studies presented in the summary

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EPO4_062

THE INCREASE OF THE LEVEL OF SOME VITAMINS AND TRACE MINERALS IN THE LAYER FEED ENABLES TO ENRICH THE CONTENT OF THE EGGS IN THESE NUTRIMENTS AND TO PRODUCE MULTI-ENRICHED EGG

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BACKGROUND AND OBJECTIVES

Some publications have demonstrated that the egg content in vitamins and trace minerals is influenced by the content in the layer feed (1). Following our work on the DHA enrichment of eggs (2), we have studied experimentally the possibility of increasing the levels of vitamins D3, E, B9, B12 of iodine and selenium. The data's for vitamin A (3) and iron comes from the literature (4). Partial RESULTS of the experimentation have already been published (5).

METHODS

The content of standard eggs in vitamins A, D3, E, B9, B12 and in iodine, iron and selenium have been studied summarizing the data's of 8 nutritional tables, including the French (6,7), the Japanese (8) and the US ones (9). The value retained is the average of the data's from these different tables after elimination of the values separated by 2 times the standard deviation of the raw mean. The values concerning the vitamins D3, E, B9, B12, the iodine and the selenium for the multi-enriched eggs were established during 8 trials comparing 2 treatments, one consisting in distributing a standard diet to hens for 4 weeks, the other a diet enriched with one or more nutriments.

RESULTS

The level in eggs of the vitamins and trace minerals can be increased by distributing layer feeds with higher nutriments contents (Table 1). The vitamin E and iodine have particularly high possibilities of enrichment (Respectively x 14 and 8). The increase is between 2.5 and 3 times for the vitamins D and B12 and between 20 and 70 % for the other nutriments.

Table 1: Levels of vitamins and trace minerals for standard (SE) and multi-enriched eggs (MEE) (/100 grams)

Nutrients	SE	MEE	Rate of increase	% coverage of MEE
Vitamin A (µg)	175	289	x 1,7	41,3
Vitamin D (µg)	2,12	5,85	x 2,8	117,0
Vitamin E (mg)	2,05	28,65	x 14,0	286,5
Vitamin B9 (µg)	65	81	x 1,2	40,4
Vitamin B12 (µg)	1,31	3,54	x 2,7	252,6
Iodine (µg)	30,3	247,8	x 8,2	190,6
Iron (mg)	1,65	2,94	x 1,8	18,4
Selenium (µg)	27,9	45,3	x 1,6	82,4

CONCLUSIONS

The eggs contents in some vitamins and trace minerals can be increased through the feeding of the layers, enabling to develop a multi-enriched egg able to improve health population.

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Anne-Yvonne Prigent EARL 3LClarisse Palacios COPRIS SASMichel Colin COPRI SAS

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EPO4_064

EFFECT OF DRYING TECHNIQUES ON NUTRITIONAL COMPOSITION, ANTI-NUTRITIONAL FACTORS AND ANTIOXIDANT POTENTIAL OF LEAF AND STEM PARTS OF PORTULACA QUADRIFIDA (KIMMA)

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BACKGROUND AND OBJECTIVES
Food and nutrition continue to pose a global challenge in public health and environmental sustainability issues. At the core lies a problem of food and nutrition burden which encompasses a range of issues in malnutrition, food insecurity, and the rise in diet- related diseases. Ethiopia faces higher rate of malnutrition due to food insecurity and nutrient-poor staple diets. *Portulaca quadrifida* (locally known as Kimma) an underutilized plant, has potential to contribute in tackling the challenges of malnutrition and promote health. This study examined the nutritional composition, anti-nutritional factors and antioxidant activity of *Portulaca quadrifida* focusing on its potential for improving diets and supporting sustainable food systems.

METHODS
Samples of fresh whole plant material of *Portulaca quadrifida* was collected from Benishangul Gumuz region Bullen district using systematic sampling technique. Both leaf and stem parts were collected, dried separately using air and freeze drying for further analysis.

RESULTS
The finding showed that greater ash, fat, as well as tannins and oxalates at concentrations of **13.62-16.91%, 3.05-3.27%, 2.85-3.42%** and **0.04-0.05%** respectively across both drying methods on the leaves. Whereas stems were superior in protein **10.16-15.07%** and had lower tannin and oxalate content **0.93-1.38%** and**0.0269-0.0293%** respectively. Significant ($P<0.05$) differences in both plant parts were observed between drying methods. In terms of antioxidant activity freeze drying demonstrated a higher total phenolic **1130.6-2876.4mgGAE/100g** and total flavonoid **216.9-3390mgQE/100g** than air drying. It also exhibited stronger antioxidant activities with radical-scavenging effects using DPPH **38.93-58.25mgAAE/100g.**

CONCLUSIONS
The study emphasizes the potential of utilizing both plant parts due to the varying nutritional and antioxidant properties suggesting further research on its sustainability, economic potential and functional food applications.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_065

THE IMPACT OF ILLEGAL SMALL-SCALE MINING ON NUTRITION, FOOD SECURITY, AND SUSTAINABLE DEVELOPMENT IN AFRICA

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BACKGROUND AND OBJECTIVES
Illegal small-scale mining has become a significant challenge across Africa, providing economic opportunities while contributing to socio-economic, environmental, and public health concerns. In Ghana, this practice is referred to as "galamsey," while similar informal mining practices, such as "zama zamas" in South Africa and "makorokoza" in Zimbabwe, underscore common challenges of unregulated mining in resource-rich regions. This review examines the historical context, drivers, impacts, and policy responses to "galamsey" in Africa, with a focus on its implications for nutrition, food security, and sustainable development

METHODS
A comprehensive review of peer-reviewed articles, government reports, and case studies was conducted. A systematic search was made in databases such as PubMed, ScienceDirect, Google Scholar, and JSTOR using search terms like "galamsey," "illegal small-scale mining," "food security and mining," and "nutrition and mining." Comparative analyses of illegal mining practices in Ghana, Zimbabwe, South Africa, and Nigeria were included to broaden the contextual understanding.

RESULTS
Illegal small-scale mining is linked to colonial histories and economic policies that relaxed regulations. Economic hardship, unemployment, and weak regulatory frameworks drive the practice. Environmental degradation, including deforestation, water contamination, and soil erosion, severely affects agricultural productivity and food security. Health risks from exposure to toxic substances including mercury release into water bodies exacerbate malnutrition by contaminating food and water sources, impairing nutrient absorption and weakening immunity. While illegal small-scale mining supports local economies, its unregulated nature worsens income inequality and food insecurity. Limited enforcement, corruption, and lack of community engagement hinder regulation efforts.

CONCLUSIONS
Illegal small-scale mining poses a significant threat to food security, nutrition, and sustainable development in Africa. Policy recommendations include strengthening legal frameworks, improving enforcement mechanisms, promoting sustainable livelihoods, and engaging local communities in monitoring efforts. Future research should assess the long-term impacts of illegal small-scale mining on food systems and evaluate the effectiveness of policy interventions in supporting food security and global health goals.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_066

IODINE NUTRITION AFTER DRINKING COW'S MILK COMPARED TO OAT DRINK – A RANDOMISED CONTROLLED STUDY

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BACKGROUND AND OBJECTIVES
A recent dietary trend involves replacing cow's milk with plant-based alternatives, motivated by the perception that plant-based options are healthier and more sustainable. This trend is especially popular among young women, of whom iodine nutrition is also of concern. Some of the plant-based alternatives are fortified with iodine, but the bioavailability and whether it is feasible to consume enough to provide an adequate iodine intake is unknown. Thus, the main objective of the present study was to compare the iodine nutrition in those drinking iodine-fortified oat drinks compared to cow's milk.

METHODS
A randomised study was initiated, in which participants were randomly assigned to either drink 6 dl of cow's milk or oat drink for 4 weeks. Healthy women between 18 and 40 years of age who were habitual milk drinkers were recruited during the fall of 2024 in Bergen, Norway. 24-hour urine was collected, and urinary iodine excretion (UIE) was calculated at baseline and end of the study. 24-hour dietary recall was used to assess habitual diet and dietary iodine intake at both time points.

RESULTS
32 healthy women (oat drink=15, cow´s milk=17) aged 19-28 years participated in the study. The median (p25-p75) UIE (p25-p75) was 123 (97-143) µg/24h at baseline and 147 (133-179) µg/24h at end of study for the oat drink group and 137 (112-174) µg/24h at baseline and 180 (136-207) µg/24h at end of study in the cow´s milk group, aligning with the epidemiological criteria for sufficient iodine nutrition. A significant increase in UIE and estimated iodine intake (from 24-hour urine and 24-hour dietary recall) was noted in the cow's milk group but not in the oat drink group. However, no significant differences between the two groups were found following the intervention for UIE, which may indicate that both drink alternatives contribute to increased iodine intake.

CONCLUSIONS
Compliance was high and comparable between both groups (oat drink and cow's milk), indicating that both drink alternatives were equally feasible for participants. Furthermore, it appears that iodine-fortified oat drink may be associated with increased iodine intake and could thus serve as a comparable source of iodine to cow´s milk.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_068

THE STATE OF FOOD COMPOSITION DATABASES: DATA ATTRIBUTES AND FAIR DATA HARMONIZATION

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BACKGROUND AND OBJECTIVES

Food composition databases (FCDBs) are essential tools for characterizing and advancing scientific understanding of the molecular composition of food across the spectrum of edible biodiversity. This knowledge supports applications across food systems from agriculture to human health. To unlock the full potential of food data, FCDBs must adhere to criteria such as validated analytical methods, high-resolution metadata, and FAIR Data Principles (Findable, Accessible, Interoperable, and Reusable). However, the complexity and variability of these databases pose significant challenges to meet these standards

METHODS

In this study, we conducted a systematic review of 35 data attributes across 101 FCDBs from 110 countries to evaluate their current state. Data attributes were categorized into three groups: general database information, food samples and components, and alignment with FAIR principles

RESULTS

Our findings reveal that many countries lack the resources to produce or maintain a national FCDB covering locally consumed foods. Existing databases show substantial variability in scope and content, with the number of foods and components ranging from a few to thousands. Databases with large numbers of foods often rely on secondary data from scientific articles or other FCDBs, while those with fewer food and components mainly include primary analytical data generated by database entities. Update frequencies also vary, with web-based databases being updated more frequently than static tables. When assessed for FAIR compliance, all FCDBs met the Findable criteria. However, challenges such as inadequate metadata, inconsistent scientific naming, and unclear data reuse policies hinder the comparability and usability of these databases. Features of FCDBs also correlate with economic classification, as high-income countries tend to produce databases with primary data, web interfaces, and more regular updates. This highlights the need for increased support and guidelines to ensure consistent and accurate global comparisons

CONCLUSIONS

This landscape assessment provides a detailed snapshot of the current state of FCDBs and identifies opportunities for improvement. We recommend expanding food and component coverage, unifying analytical methods, and enhancing metadata and FAIR compliance to improve global harmonization. By fostering a comprehensive understanding of food composition, FCDBs can better support stakeholders in addressing societal challenges, leveraging data-driven solutions to promote human and planetary health

CONFLICTS OF INTERESTS

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EPO4_069

TITLE: LEVERAGING THE ROLE OF UNDERUTILIZED FOODS TOWARDS A SUSTAINABLE FOOD SYSTEM: THE CASE OF ANCHOTE (COCCINIA ABYSSINICA)

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BACKGROUND AND OBJECTIVES
Introduction: The study will investigate the potential of underutilized foods (UFs) to improve food security and sustainability. UFs, which are sometimes overlooked in contemporary diets, have a variety of nutritional properties and can be quite advantageous. In order to advance sustainable food systems and broaden culinary horizons, consideration of underutilized crops is essential. Anchote are frequently overlooked despite their high nutritional values and potential to improve food security and decrease malnutrition. The reasons include social taboos, labor-intensive processing, environmental factors, and traditional management methods. A wide variety of UFs should be incorporated into agriculture and food systems in order to accomplish goals including the elimination of hidden hunger, encouragement of food diversity, and environmental sustainability.

METHODS
Methodology: A cross-sectional study was conducted among farmers producing Anchote. A total of 40 farmers from four districts were e involved in this research. Anchote cultivars tuber part and the indigenous knowledge data collections were conducted by focus group discussion and key informants' data collection methods. Five kilograms of Anchote variety samples were taken from each of these four districts, for a total of forty kilograms. Following collection, the samples will be analyzed utilizing cutting-edge OMIC technologies, such as proteomics, lipideomics, ionomics, and metabolomics.

RESULTS
Expected RESULTS: The underutilized plant Anchote from the tuber crop was investigated for its nutritional and biochemical composition using omics techniques to determine how they might be affected by the growing agro-ecology and variety effect. The nutritional and biochemical chomposition of the Anchote will be well understood by this study, which could provide important information on its quality and affordability.

CONCLUSIONS
Conclusion: underutilized plants, anchote can mitigate food and nutrition insecurity by providing vitamins, minerals, dietary fibers, and bioactive compounds. This research will provide valuable insights for policymakers, food producers, and consumers to leverage the potential of anchote in creating a more sustainable and equitable future of food.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_070

UNLOCKING THE POTENTIAL OF UNDERUTILIZED CROPS FOR SUSTAINABLE FOOD SYSTEMS AND IMPROVED NUTRITION IN EUROPE

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BACKGROUND AND OBJECTIVES

The BioValue and Diversicrop projects share a common goal of enhancing food security, agricultural sustainability, and human nutrition by focusing on underutilized, genetically diverse crops. These initiatives address critical challenges in the European agri-food system, such as climate resilience, nutritional quality, and sustainable land use, aligning with the European Green Deal's Farm to Fork and Biodiversity strategies and contributing to the UN Sustainable Development Goals.

METHODS

BioValue and Diversicrop used agent-based modeling, participatory breeding, consumer surveys, literature reviews, case studies, and database analysis.

RESULTS

BioValue emphasizes the reintegration of underutilized crops into the European agri-food value chain through advanced methodologies, including agent-based modeling to optimize production, quality control, and delivery systems. Its participatory breeding programs identify high-yield, market-viable cultivars across diverse climatic regions, while novel food development engages nutritionists, food scientists, and chefs to create innovative, consumer-accepted products. By promoting seven underutilized crops in twelve countries, BioValue supports sustainable agriculture, healthier diets, and resilience to environmental and political challenges.
Similarly, Diversicrop explores the historical, genetic, and adaptive potential of resilient crops such as rye and legumes to inform sustainable cultivation practices and dietary recommendations. The project employs a multidisciplinary approach, with the nutrition working group assessing the nutritional value, health benefits, and consumption patterns of these crops through literature reviews, case studies, and analysis of databases like FAO food balance sheets and EFSA resources. By integrating historical insights, modern agricultural techniques, and policy data, Diversicrop aims to overcome barriers to the utilization of these crops, enhancing crop diversity, improving nutritional outcomes, and strengthening the resilience of European food systems.

CONCLUSIONS

These projects highlight the value of collaboration and innovation in tackling agricultural and nutritional challenges. By revitalizing underutilized crops and advancing sustainable food systems, BioValue and Diversicrop support resilient, nutritious food for future generations.

CONFLICTS OF INTERESTS

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EPO4_071

FIBER-ENRICHED KOMBUCHA TEA MODULATES TRIGLYCERIDES AND THE GUT MICROBIOTA IN HEALTH POPULATION: A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
The development of functional foods with health-promoting properties is a priority in addressing chronic diseases. Studying the effect of these foods on gut microbiota provides critical insights into the interplay between microorganisms, health, and disease. This study aimed to evaluate the effects of fiber-enriched kombucha tea on biochemical parameters and gut microbiota composition in a healthy population.

METHODS
A randomized, double-blind, parallel nutritional intervention trial was conducted with 60 participants (58 completed: 42 women and 16 men; mean ± SD age: 39.7 ± 14.5 years). Participants were randomized into two groups consuming either 250 mL/day of a control beverage or the fiber-enriched kombucha tea for six weeks. Lifestyle and biochemical data were collected, and gut microbiota composition and diversity were assessed using 16S rDNA sequencing.

RESULTS
Significant biochemical and microbiota-related improvements were observed in the study group compared to the control. The study group exhibited a statistically significant reduction in triglyceride levels (baseline mean ± SEM: 69.6 ± 7.0 mg/dL; post-intervention: 62.8 ± 5.1 mg/dL), while the control group experienced a slight increase (baseline: 77.2 ± 8.6 mg/dL; post-intervention: 82.7 ± 8.8 mg/dL; $p = 0.031$). Additionally, fiber-enriched kombucha consumption led to a notable increase in *Bifidobacterium* abundance, recognized for its intestinal health benefits and immunomodulatory effects. A reduction in *Ruminococcus torques*, linked to inflammatory bowel diseases, was also observed.

CONCLUSIONS
Fiber-enriched kombucha tea demonstrates potential health benefits, including triglyceride modulation and positive alterations in gut microbiota composition. These findings suggest its promise as a functional beverage for improving metabolic and gut health in healthy individuals. Further randomized controlled trials are warranted to confirm these benefits.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_073

THE INTERSECTION BETWEEN FOOD PRODUCTION AND THE GLOBAL SYNDEMIC: A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES
Food systems are key drivers of the global syndemic, which involves undernutrition, obesity, and climate change. However, few studies explore how specific components of the food system influence this syndemic. This study aimed to identify the relationships between food production and the components of the global syndemic.

METHODS
A scoping review was conducted between January and September 2024. The search strategy utilized keywords related to food production and each component of the syndemic (obesity, undernutrition, and climate change), filtered by title and abstract, and limited to the last five years. The main inclusion criterion was that the study addressed food production and at least two components of the global syndemic.

RESULTS
The initial search identified 6,567 articles, of which 4,080 remained after removing duplicates. Following the title screening, 951 articles were selected, and 28 were included after abstract and full-text review. Among these, 27 studies addressed climate change and undernutrition, while one study explored all three components of the syndemic within the scope of food production.
An in-depth analysis revealed that food production significantly contributes to the worsening of the global syndemic. Studies showed that climate change negatively impacts soil fertility, reducing agricultural productivity. This, in turn, affects physical and economic access to food, influencing dietary intake and population nutritional status. Furthermore, the adverse effects of climate change drive some farmers to shift to livestock farming as an immediate solution to declining soil fertility and reduced crop yields. In addition, the increase in extreme weather events caused by climate change disproportionately affects rural populations, leading to higher migration rates. This migration disrupts access to healthy foods and further deteriorates the nutritional status of affected populations. While the relationship among food production, climate change and undernutrition is well-documented, there are significant gaps in understanding the link among food production, undernutrition and obesity, as few studies address obesity in this context of food production.

CONCLUSIONS
The findings emphasize the central role of food production in worsening the global syndemic, particularly through climate change and undernutrition, while highlighting the need for further research on obesity. This review lays the groundwork for developing sustainable strategies to tackle these interconnected challenges.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_074

EXAMINING THE EFFECTS OF HAEMOGLOBIN AND IRON STATUS ON CHILD NEURODEVELOPMENT IN UGANDA

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BACKGROUND AND OBJECTIVES

Children in Sub-Saharan Africa (SSA) are highly vulnerable to impaired development, especially in the critical first five years of life, due to multiple exposures such as infections and nutritional deficiencies. Anaemia and iron deficiency (ID), which are prevalent among pregnant women and young children in SSA, have been linked to abnormal brain development. However, evidence on the association between ID, anaemia, and child neurodevelopment in SSA remains limited. This study aimed to examine the effects of maternal and child haemoglobin (Hb) levels and child iron status on neurodevelopmental outcomes in preschool-aged Ugandan children.

METHODS

We utilized data from the Entebbe Mother and Baby Study, a prospective birth cohort, to assess the effect of maternal and child Hb levels, and child iron status, on developmental scores in 933 and 530 pre-school Ugandan children, respectively. Neurodevelopmental outcomes were measured at 15 months and 5 years. We used regression analyses to examine associations between maternal and child Hb levels, child iron status, and neurodevelopmental scores, adjusting for potential confounders.

RESULTS

Lower Hb levels in infancy were associated with reduced psychomotor and language scores at 15 months (β:0.07, 95% CI: 0.02-0.12, p=0.003). Lower maternal Hb levels were also independently associated with reduced psychomotor scores in children at 15 months (β: 0.05, 95% CI: 0.0002-0.09, p=0.05). We found an interaction between maternal and infant anaemia such that anaemia at both time points resulted in a much larger reduction in psychomotor scores at 15 months (β: −0.35, 95% CI: −0.52-−0.19, p<0.0001). However, no associations were observed between anaemia or ID and cognitive or motor scores at five years of age.

CONCLUSIONS

These findings highlight the importance of addressing anaemia during pregnancy and early childhood to improve child development. While no long-term effects on neurodevelopmental outcomes at five years were observed, more research is necessary to fully understand the impacts of anaemia and ID on child neurodevelopment in SSA. We plan to further investigate the effects of anaemia and iron status on neurodevelopmental outcomes in young African children applying the Mendelian Randomization approach to infer causality.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO4_075

EXAMINING SEX DIFFERENCES IN UNDERNUTRITION AMONG CHILDREN UNDER FIVE: FINDINGS FROM A META-ANALYSIS OF 93 CROSS-SECTIONAL SURVEYS IN SEVEN EMERGENCY CONTEXTS

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BACKGROUND AND OBJECTIVES
There is growing evidence that gender inequality is associated with malnutrition. Recent literature suggests that undernutrition may differ across sexes and by assessment tools. The objective of this research was to determine if the status of undernutrition differed between sexes among children under five years of age in seven humanitarian contexts.

METHODS
Data were obtained from n=93 representative, sub-national SMART surveys (2018-2022). Bayesian random-effects meta-analysis was used to determine the log odds ratios for undernutrition outcomes among boys versus girls. Undernutrition outcomes assessed included global acute malnutrition (GAM), severe acute malnutrition (SAM), and stunting. GAM and SAM were assessed by both weight-for-height z-scores (WHZ), mid-upper-arm circumference (MUAC), and edema. Stunting was assessed through height-for-age z-score (HAZ). An index combining all children classified as acutely malnourished was also explored.

RESULTS
Overall, data from n=29,323 boys and n=28,772 girls were included in the WHZ analysis while data from n=29,763 boys and n=29,129 girls were included in the MUAC analysis. Data from n=28,010 boys and n=27,367 girls were available for HAZ analysis. Significant differences were found for all undernutrition indicators across sexes, but the odds differed depending on the indicator analyzed. Based on WHZ, boys had significantly higher odds of GAM (OR: 1.30; 95% CrI: 1.23, 1.38) and SAM (OR: 1.47; 95% CrI: 1.33, 1.63) as compared with girls. However, when using MUAC, boys were observed to have significantly lower odds of GAM (OR: 0.82, 95% CrI: 0.77, 0.87) and SAM (OR: 0.87; 95% CrI: 0.78, 0.97) as compared with girls. Looking at a combined index of acute malnutrition, that considered both MUAC and WHZ, boys had slightly higher odds of both cGAM (OR: 1.06, 95% CrI: 1.01, 1.12) and cSAM (OR: 1.10; 95% CrI: 1.01, 1.20) than girls. The odds of stunting (OR: 1.45 95% CrI: 1.37, 1.53) were also higher among boys than girls.

CONCLUSIONS
Our findings show that, based on WHZ and HAZ, boys have significantly higher odds of undernutrition than girls. However, when children were assessed using MUAC, girls had significantly higher odds of both GAM and SAM. Altogether, these data affirm the complementarity and additive nature of the two measurement methods and emphasize the need to use both for acute malnutrition assessments. Further research is needed to understand how and why sex and gender differences in undernutrition occur so that preventative, gender-transformative programming can be implemented.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_076

ADDRESSING VACCINE HESITANCY IN ADULTS: A CBPR STUDY THROUGH THE LENS OF THE EXPANDED FOOD AND NUTRITION EDUCATION PROGRAM

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BACKGROUND AND OBJECTIVES
Adults in Black Indigenous People of Color (BIPOC) communities face disproportionate risks from vaccine-preventable diseases. Vaccine hesitancy, driven by mistrust, misinformation, and systemic barriers, poses a significant public health challenge. This study aimed to assess vaccination perceptions, develop culturally relevant interventions, and evaluate changes in attitudes following an educational initiative linked to the Expanded Food and Nutrition Education Program (EFNEP) in rural Delaware and Maryland.

METHODS
A mixed-methods Community-Based Participatory Research (CBPR) approach was employed, combining quantitative surveys with qualitative focus groups and interviews.The study included 124 participants pre-intervention and 89 post-intervention, primarily adults from BIPOC communities engaged in EFNEP in Sussex County (Delaware) and Somerset and Wicomico Counties (Maryland).Quantitative data were analyzed using logistic regression, while qualitative data were thematically coded. Pre- and post-intervention data comparisons identified shifts in barriers, facilitators, perceptions, and trust.

RESULTS
Pre-Intervention Barriers: Lack of accurate information (57.4%) and mistrust in public health agencies (36.8%).
Facilitators: Nutrition education program, family networks, and healthcare provider recommendations were critical in encouraging vaccination.
Post-Intervention Outcomes: Barriers to vaccination decreased by 93%, and trust in healthcare providers rose by 90%. Participants reported improved understanding of vaccine safety and efficacy, though lingering skepticism was noted

CONCLUSIONS
Community-focused educational interventions integrated with EFNEP effectively reduced vaccine hesitancy and enhanced trust among rural BIPOC adults. Community Engagement: Leveraging trusted community leaders and networks to disseminate vaccine information can enhance credibility and acceptance. These findings emphasize the importance of culturally sensitive strategies and the synergy between nutrition education and vaccine confidence-building efforts. Future research should explore the scalability and long-term impact of such integrated interventions across diverse populations.

CONFLICTS OF INTERESTS
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EPO4_077

HEALTHY EATING INTENTIONS OF CHINESE ADULTS ARE MODIFIED BY FOOD LITERACY: THE THEORY OF PLANNED BEHAVIOR

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BACKGROUND AND OBJECTIVES
With rapid economic growth in China, unhealthy dietary patterns have become a significant contributor to the rising prevalence of chronic diseases. Food literacy—encompassing the knowledge, skills, and capacity to select, prepare, and consume food—plays a crucial role in shaping dietary behaviors. This study investigates the impact of food literacy on healthy eating intentions based on the theory of planned behavior (TPB).

METHODS
A cross-sectional survey was conducted with 492 adults in Shandong Province, China. Data were analyzed using multiple regression analysis and structural equation modeling (SEM). The TPB framework, consisting of attitudes, subjective norms, and perceived behavioral control (PBC), was employed to explore the relationship between food literacy and healthy eating intentions.

RESULTS
Higher food literacy levels were associated with increased scores for TPB constructs and stronger behavioral intentions. Regression analysis revealed that all three core components of TPB—attitudes, subjective norms, and PBC—were positively correlated with healthy eating intentions, with PBC showing the strongest association. Notably, food literacy enhanced PBC, leading to greater behavioral intentions. Among participants with the lowest and highest food literacy levels, subjective norms and attitudes, respectively, were the primary drivers of behavioral intentions. SEM analysis demonstrated that food literacy directly influenced TPB components, while subjective norms and PBC significantly predicted healthy eating intentions. However, attitudes did not significantly predict behavioral intentions.

CONCLUSIONS
This study highlights the pivotal role of food literacy in fostering healthier eating behaviors through its influence on TPB constructs. Enhanced food literacy not only strengthens PBC and subjective norms but also promotes intentions to adopt healthier diets. These findings suggest that policymakers and educators should prioritize initiatives aimed at improving food literacy among adults to promote public health. This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT) (RS-2023-00280503)

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_078

SEVERE ANAEMIA AND BACTERAEMIA AMONG KENYAN CHILDREN: A RETROSPECTIVE ANALYSIS OF 26 YEARS HOSPITAL SURVEILLANCE DATA

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BACKGROUND AND OBJECTIVES
Severe anaemia is an important cause of hospital admission and death among children living in sub-Saharan Africa, yet epidemiologic data on the causes and outcomes of severe anaemia in this population remains scarce.

METHODS
We conducted a retrospective analysis of systematically collected admissions data of children under 14 years admitted between August 1998 and June 2024. World Health Organization age-specific definitions of severe anaemia were used. We examined temporal trends, underlying causes, and the association between severe anaemia and bacteraemia.

RESULTS
Of 106,544 admissions, 16.6% (n=17,659) had severe anaemia and 36.5% (n=38,902) had moderate anaemia. The median age of severely anaemic children increased over time. Sickle cell disease (adjusted odds ratio (aOR) 9.7 [95% confidence interval 9.1, 10.4]), malaria (aOR 3.4 [3.2, 3.5]), human immunodeficiency virus infection (aOR 1.8 [1.6, 2.0]), wasting (aOR 1.7 [1.6, 1.7]), and stunting (aOR 1.6 [1.5, 1.6) were independently associated with severe anaemia. Severe anaemia was associated with a 72% increased risk of all-cause bacteraemia (aOR 1.7 [1.6, 1.9]), specifically with non-typhoidal *Salmonella*, *Escherichia coli*, *Streptococcus pneumoniae* and *Haemophilus influenzae*. The risk of bacteraemia increased along a spectrum of anaemia severity. The case fatality rate of children with severe anaemia and bacteraemia was 29.5% and varied by underlying bacterial pathogen.

CONCLUSIONS
Severe anaemia has multifactorial and age-specific causes, and remains a largely unrecognised and understudied risk factor for bacteraemia in Kenyan children. Addressing severe anaemia could reduce both anaemia-related morbidity and bacteraemia incidence.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_079

EXPLORING THE GENDERED NATURE OF MALNUTRITION: AN ANALYSIS OF DATA AVAILABILITY AND GENDER DIFFERENCES IN SEVEN HUMANITARIAN CONTEXTS

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BACKGROUND AND OBJECTIVES
There is growing evidence that gender inequality is associated with malnutrition. To provide effective programming, humanitarian actors require data on nutrition needs and contributing factors. The purpose of this research was to utilize a gender transformative framework to understand 1) data availability for sex and age-disaggregated data (SADD) and existing gender metrics and 2) the differences in undernutrition between sexes.

METHODS
Mixed-methods analyses were conducted, underpinned by the Gender Transformative Framework for Nutrition (GTFN) as the main analytical framework. A landscaping exercise was conducted to develop a clear understanding of gender data availability, determining which gender indicators and metrics may contextualize the differences in undernutrition between sexes. Key informant interviews were held to further explore the potential differences in undernutrition across sexes. Key insights were collected from gender and nutrition specialists (n=17). Responses were analyzed using deductive thematic content analysis and NVivo statistical software. Quantitative analyses are described elsewhere.

RESULTS
An analysis of program data revealed significant gaps in SADD within current nutrition monitoring frameworks and inconsistencies within collected gender metrics and gender indicators used across programs and global dashboards. Unreliable gender data presented challenges and provided limited information for use of an analytical framework to guide a thorough gender analysis (e.g., GTFN). Concurrently, inconsistencies in how metrics are collected, collated, and shared across regions presented a barrier to accuracy and the ability to compare data and provide insight into gender differences associated with undernutrition. Respondents, however, cited potential reasons why gender differences in undernutrition may occur, including biological differences between sexes, boys having increased exposure to infection, differential care practices by gender, and gendered societal norms.

CONCLUSIONS
There was a striking absence of both quantitative and qualitative program data for sex and gender, alongside an absence of standardization in gender indicators and data collection methods. To ensure that nutrition programs are truly equitable, it is essential to address the gendered nature of nutritional needs. By prioritizing technical development for standardisation in gender indicators, and sex and gender-disaggregated data collection methods, the global humanitarian community can take a significant step toward achieving transformative action in gender equality for nutrition programming.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_081

REFINING THE NEXT GEN(D)ERATION LEADERSHIP COLLECTIVE'S THEORY OF CHANGE: A SCOPING REVIEW TO GUIDE INTERVENTIONS THAT IMPACT POWER STRUCTURES IN FOOD AND NUTRITION SYSTEMS

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BACKGROUND AND OBJECTIVES
The Next Gen(d)eration Leadership Collective's (NGLC) was founded in 2020 by women working globally in food and nutrition systems, with the aim of contributing to reducing power imbalances in food systems. To this end, the NGLC has developed a theory of change (TofC) focused on the support of collective action that guides its activities . This theory, informed by literature reviews and internal discussions among the collective's members - currently has six interconnected nodes: “Collective support,” “Collective efficacy,” “Collective agency,” “Mobilizing a coalition,” “Collective action,” and “Redressing power imbalances in leadership.” The aim of this review is to: (i) systematically identify the commonly used definitions for each of the NGLC TofC nodes and compare these with current definitions used by the Collective, and (ii) identify the satellite terms correlated to these central nodes.

METHODS
For this purpose, a theoretical scoping review was carried out in February to July 2024 following the 2020 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The keywords were defined by consulting Decs/Mesh ('Collective agency' OR 'Collective efficacy' AND 'Theory of change') and the search used five databases (PubMed/Medline, Embase, Web of Science, Scopus, and JSTOR). Papers were extracted and assessed using Covidence. Three reviewers independently screened titles and abstracts, followed by full-text screening for eligibility and data extraction. Conflicts were resolved by an independent reviewer. The eligibility criteria included: language (English, French, Spanish, Portuguese and Italian), have undergone a peer-review process, and include conceptual definitions of the nodes of the NGLC TofC.

RESULTS
After eliminating duplicates, 761 papers were identified, of which 77 were included for this study. Papers came from different disciplines and a great variety of journals. The literature was aligned with the definitions of nodes used in the NGLC TofC, but the satellite terms broadened and refined these definitions, and indicated homologies between other terms that can be used by the collective.

CONCLUSIONS
The concatenation and definition of the nodes of the current NGLC TofC largely corresponds to what was found in the literature; however, the literature allowed us to identify terms connected to the nodes that enrich the conceptual definition used by the NGLC.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_082

“WE ARE WOMEN, AND OUR VOICES SHOULD BE LOW”: UNDERSTANDING THE INFLUENCE OF HOUSEHOLD GENDER DYNAMICS AND INTIMATE PARTNER VIOLENCE ON HOUSEHOLD DECISION-MAKING AND FOOD CHOICE IN RURAL TANZANIA

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BACKGROUND AND OBJECTIVES
Behavior change interventions to improve nutrition must account for household gender dynamics and the impact of intimate partner violence (IPV). IPV can undermine women’s autonomy and decision-making, limiting their ability to adopt and sustain recommended health and nutrition practices. This study examined how IPV and its threat influence women’s agency in decision-making on food production, purchasing, and preparation.

METHODS
This mixed-methods study explored barriers to improved nutrition and health among 58 couples in rural Tanzania through Demographic and Health Survey items, in-depth interviews, and pile-sorting exercises using artificial money. Decision-making and IPV were assessed separately among men and women. Quantitative and qualitative analyses were triangulated to identify patterns and implications.

RESULTS
Men and women often reported that household decisions were made jointly, as assessed with standardized questionnaires used globally, yet interviews revealed that women were often only informed of decisions or that husbands had the final say. Pile-sorts revealed distinct patterns in resource allocation: men prioritized investments in business and savings, reflecting their role as primary providers, while women allocated resources to clothing and food, aligning with their caregiving responsibilities. Women were usually tasked with and had agency over meal preparation, but lack of decision-making power over what food was grown, sold, or purchased constrained their ability to access the necessary food. IPV or the threat of IPV further constrained women’s ability to influence agricultural activities and food purchasing decisions.

CONCLUSIONS
Lack of agency among the primary preparers of household meals limits uptake of nutrition recommendations. Addressing cultural norms and the impact of IPV on household dynamics is critical to the success of nutrition and health interventions. In-depth assessment of decision-making patterns can help identify how to overcome constraints on women’s agency. Community-based strategies to empower women and mitigate IPV-related barriers are essential for fostering sustainable behavior change and improving health outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_083

ADHERENCE TO THE PLANETARY HEALTH DIET AND ITS RELATIONSHIP WITH THE NUTRITIONAL STATUS OF ADOLESCENTS

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BACKGROUND AND OBJECTIVES

The Planetary Health Diet Index (PHDI) was developed to verify adherence to a healthy and sustainable diet proposed by EAT-Lancet Comission. Evidence indicates that greater adherence to this diet can help promote remission of obesity in children and adolescents. Given the scarcity of studies evaluating adherence to this diet among adolescents in Brazil, the objective was to assess it and its relationship with nutritional status.

METHODS

This was an observational, cross-sectional study carried out in public schools with adolescents aged between 10 and 18. A sub-sample of 100 adolescents who took part in a larger study entitled “Dyslipidemia and dietary practices in adolescents in Fortaleza” was used. Weight and height were measured to assess nutritional status using the Body Mass Index (BMI) for age and a 24-hour food recall was applied. To assess adherence to the planetary health diet, the PHDI was used, which divides foods into 16 components, categorized into four groups: adequacy, optimum, ratio and moderation. The total score of the index ranges from 0 to 150 points, where the higher the score, the greater the adherence to the diet. RESULTS were presented by mean and standard deviation (SD). The PHDI was compared between the groups with and without excess weight using the Student's t-test for independent samples or the Mann-Whitney test, depending on the normality of the data. The significance value considered was $p<0.05$.

RESULTS

The adolescents had a mean age of 13 (SD 1.22) years and were mostly female (54%), with a mean BMI of 20.15 kg/m2 (SD 4.15). The total PHDI score for the sample was 38 points (SD 11.63) and there was no difference between the groups. Adolescents who had excess weight had a lower prevalence of consumption of Dairy products ($p=0.030$) and Vegetable oils ($p=0.005$), scoring lower in the Optimum Group ($p=0.027$). In the Moderation Group, the consumption of Red meat was more frequent ($p=0.029$) in the group with excess weight, while Chicken and sausages were more consumed ($p=0.042$) in the group without excess weight.

CONCLUSIONS

The adolescents showed low adherence to the planetary health diet, reaching only 25% of the maximum PHDI score. No relationship was found between adherence to the diet and nutritional status, but adolescents with excess weight reported more frequent consumption of red meat and less frequent consumption of dairy products, vegetable oils and chicken and sausages, compared to those who did not have excess weight.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO4_084

THE LOW GLOBAL DIET QUALITY SCORE IS ASSOCIATED WITH HIGH RISK OF OVERWEIGHT IN PEOPLE WITH MULTIPLE SCLEROSIS

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BACKGROUND AND OBJECTIVES
Obesity, and diet quality contributes to the progression and symptomatology in people with Multiple Sclerosis [pMS]. The Global Diet Quality Score [GDQS] was developed to be a simple, timely and cost-effective is reflective of both nutrient adequacies. Therefore, this study seeks to investigate the relation between anthropometric indexes and body adiposity with the GDQS in pMS.

METHODS
This is a cross-sectional, analytical study that included pMS. The nutritional state was evaluated based on body mass index [BMI], waist circumference [WC], and body fat percentage [% BF]. The GDQS was used for qualitative dietary assessment and was calculated according to a validated methodology.

RESULTS
The study included 106 participants, the majority of whom were female (80.2%) and had the relapsing-remitting clinical form [RRMS] (89.6%). The group presented a nutritional diagnosis of overweight according to BMI (n = 61, 57.5%), and 53.8% had an elevated WC (n = 57), 60.4% and 44.3% had elevated %BF, according to BIA and US, respectively. GDQS classification, 98% of the sample (n = 104) had low dietary quality and a high risk of developing non-communicable chronic diseases. Patients with higher BMI (p = 0.012), and WC (p = 0.018) had lower GDQS scores.

CONCLUSIONS
It is concluded that in pMS, a low GDQS score appears to be associated with overweight, and higher WC. Further longitudinal research on this topic is necessary for the development of targeted treatments.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO4_085

IMPACT OF COMMUNITY- FOCUSSED INTERVENTIONS, POLICIES AND PROGRAMMES ON GROWTH AND ANAEMIA IN CHILDREN UNDER FIVE IN LMICS: A SYSTEMATIC REVIEW OF SYSTEMATIC REVIEWS

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BACKGROUND AND OBJECTIVES
Child undernutrition is a major global health concern, with children in low- and middle-income countries (LMIC) at the highest risk (1-3). Several LMICs have implemented various interventions, policies, or programmes on a local, regional, or national level to address this issue. Systematic reviews have synthesised the effectiveness of those initiatives, with some focusing on a single specific outcome, such as child growth, while others examine multiple factors and outcomes in multiple settings (4-6). However, very little is known about the effectiveness of community-focussed interventions, policies or programmes, on child growth and anaemia together (key indicators of child undernutrition) in LMICs. Therefore, this systematic review of systematic reviews was conducted to address this research gap.

METHODS
The major electronic databases; MEDLINE, Embase, CINAHL, Scopus, Cochrane and Web of Science were searched from 2000 to 2024 April. The articles were reviewed by four authors. The methodological quality of identified reviews was assessed using AMSTAR-2 tool (7).

RESULTS
In total 63 systematic reviews of variable quality (low-high) assessing the impact of the interventions, policies and programmes on child growth and/or anaemia in under-5 children were identified. Of the 20 studies reporting on both child growth and anaemia, community-focussed interventions with positive effects were animal source food consumption, fortification, supplementation, educational programmes, cash transfers, and nutritional support programmes (n=5). Among 41 studies reporting on stunting, wasting, and underweight, a combination of nutrition-specific (n=3) and nutrition-sensitive interventions (n=8) such as agricultural intervention, cash transfers, WASH (water, sanitation, and hygiene), micronutrient supplementation, education, group platforms, and fortification proved highly effective. Interventions that contributed to reduction of anaemia (n=17) were fish consumption, cooking in an iron pot, iron fortification, micronutrients and zinc supplementation. Programmes such as Mexico Oportunidades, Progresa effectively improved child growth and/or anaemia status. Furthermore, multisectoral policies focusing on scaling up community-based nutrition programmes were effective in improving child growth.

CONCLUSIONS
This study identified several community-focussed interventions that effectively improved child growth or reduced anaemia. Among these, five interventions and one programme had the greatest positive impact on both outcomes. These findings can guide the design of interventions, policies, and programs to address multi-forms of child undernutrition in LMICs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5 - Public health and nutrition throughout life cycle

EPO5_003

DIETARY IRON BIOAVAILABILITY IN PREMENOPAUSAL AUSTRALIAN WOMEN

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BACKGROUND AND OBJECTIVES
Premenopausal women are at risk of iron deficiency due to increased requirements for iron. To prevent iron deficiency, recommended intakes have been developed based on physiological requirements for absorbed iron and iron bioavailability. However, iron bioavailability is difficult to estimate as it depends on the composition of the diet and an individual's absorptive efficiency. Several algorithms have been proposed to estimate iron bioavailability from diets. These algorithms can be complex and often underestimate bioavailability. Recently, a new approach was developed by Dainty et al.,(1) which is based on calculated iron requirements, total dietary iron intakes, and the distribution of serum ferritin concentration values in the population. This model has been used by the European Food Safety Authority to set recommended iron intakes for adults.(2) In contrast, the recommended iron intakes for Australian adults are based on iron bioavailability estimates from the US Institute of Medicine, which were primarily derived from 15 free living US adults.(3) Therefore, the aim of this study was to predict dietary iron absorption in a representative sample of premenopausal Australian women using the model developed by Dainty et al.(1)
METHODS
Dietary iron intake and serum ferritin data from the 2011-13 Australian National Nutrition and Physical Activity Survey and National Health Measures Survey were analyzed in 503 premenopausal women aged 18-49 years. Women were excluded if they were pregnant or lactating, had elevated C-reactive protein, consumed iron-containing supplements, or misreported energy intake. Dietary iron intake was assessed via two non-consecutive 24-hour recalls. Usual daily iron intake was determined by the Multiple Source Method. Dietary iron absorption was estimated using the predictive model developed by Dainty et al.(1) and the Institute of Medicine's distribution of individual dietary iron requirements.(3)
RESULTS
Mean (SD) usual dietary iron intake was 10.4 (2.6) mg/d. The prevalence of serum ferritin < 15 µg/L was 14.1% (95% CI: 10.2%, 19.3%), and < 30 µg/L was 37.0% (95% CI: 31.8%, 42.5%). Predicted dietary iron absorption at serum ferritin concentrations of < 15 µg/L was 29.5%, and at serum ferritin concentrations of < 30 µg/L it was 19%.
CONCLUSIONS
Our findings do not support the bioavailability assumption of 18% used to develop the Australian recommended iron intakes for premenopausal women based on the need to maintain serum ferritin concentrations of 15 µg/L.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_005

IRON DEFICIENCY ANAEMIA AND OBESITY: INVESTIGATING THE LINK BETWEEN INFLAMMATION AND IRON BIOMARKERS IN WOMEN

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BACKGROUND AND OBJECTIVES
Research indicates that obesity-related inflammation may disrupt iron metabolism, potentially increasing the risk of iron deficiency anaemia (IDA). However, only a limited number of studies have explored this, particularly among women in developing countries. This case-control study aimed to examine the association between iron biomarkers, inflammation status, and obesity in young adult women.
METHODS
Six hundred young women (aged 19–29 years) were initially screened and matched for the case and control groups. After matching for socio-demographic criteria, 174 cases (overweight/obese women) and 167 controls (normal-weight women) were included in the analysis. Iron status markers, inflammation markers, and hepcidin levels were measured. Biochemical data were presented as means (standard deviation) or medians (interquartile range), and bivariate and multivariate analyses were performed.
RESULTS
Iron deficiency (serum ferritin <150 µg/l) and anaemia (haemoglobin <12 g/dl) were prevalent in 5.0% and 25.8% of participants, respectively, with no significant differences observed between groups. Serum ferritin levels were significantly higher in overweight/obese women (mean ± SD = 44.26; p = 0.014). Similarly, levels of haemoglobin, Alpha-1-acid Glycoprotein (AGP), C-reactive protein (CRP), and hepcidin were higher in the case group, although these differences were not statistically significant (p > 0.001). Multivariate modelling identified BMI as a significant predictor of serum ferritin (coefficient = 0.136; standard error = 0.006; p = 0.014), AGP (coefficient = 0.200; standard error = 0.013; p < 0.001), and CRP (coefficient = -0.123; standard error = 0.029; p = 0.028).
CONCLUSIONS
This study indicated that, whereas iron deficiency and anaemia were common in young adult women, there were no significant differences between overweight/obese and normal-weight groups. However, women who were overweight or obese had higher serum ferritin levels, and BMI was found to be a significant predictor of serum ferritin, AGP, and CRP levels. These RESULTS imply that inflammation linked to obesity may affect iron metabolism, which requires more investigation.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_006

CONSUMPTION OF ORGANIC FOODS DURING PREGNANCY AND INFANCY AND BMI Z-SCORE UP TO 7.5 YEARS

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BACKGROUND AND OBJECTIVES

Consumption of organic foods has been associated in adults with a lower risk of overweight, regardless of possible confounding factors (in particular dietary patterns and socioeconomic position). However, no studies have investigated these associations with consumption during the perinatal period. The objective of this work was to analyze the link between the consumption of organic foods during pregnancy and infancy and BMI of children up to 7.5 years of age.

METHODS

Data from 9,946 children of a nationwide birth cohort were analyzed. Consumption of organic foods was assessed using a single item in mothers at the delivery for the whole pregnancy and in infants monthly during the complementary feeding period. Anthropometric data were collected from the child's health booklet up to 7.5 years. At the 7.5-year follow-up, parents were also asked to weigh and measure their child according to an established protocol. Child's BMI z-scores were calculated at 1, 2, 3, 5 and 7.5 years. The associations between organic food consumption and BMI z-score and overweight were evaluated, at each age, using multivariable linear or logistic regressions, adjusted for main confounders, including socioeconomic position, diet quality during pregnancy and both parents' BMI.

RESULTS

Almost half of women never consumed organic foods during pregnancy, whereas 8% consumed them daily. Similarly, almost half of children never consumed organic foods during the complementary feeding period, while one of tenth consumed them almost always. A frequent consumption of organic foods at both periods was associated with a lower BMI z-score at 1 year and a lower risk of overweight at 5 years (OR [95%CI] = 0.64 [0.45; 0.90]). All associations remained consistent after accounting for any breastfeeding duration or other infant feeding practices.

CONCLUSIONS

These RESULTS suggest that frequent consumption of organic foods during the perinatal period might be associated with lower risk of overweight up in early childhood, independently of other feeding practices. However, these findings need to be confirmed at older ages as well as in other studies using more detailed exposure.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_009

DIETARY INTAKE AND FOOD HABITS AMONG MIGRANTS IN EUROPE: A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES
Significant demographic changes are underway globally and in Europe–9% of the EU inhabitants are foreign-born. Migration reflects nutrition transitions, which relate to health outcomes and broader sustainability dimensions. Such transitions may present direct and indirect links with the changing food environment and the individual characteristics describing the evolving socio-economic and cultural position of migrants. We conducted a scoping review in order to map the studies describing diet and food habits among migrant groups in Europe.
METHODS
Two bibliographic databases, i.e. Web Of Science (WoS) and PubMed, were used to retrieve relevant literature. We included studies published from 2000 onwards, which were conducted in Northern and Western Europe, and they were based on quantitative assessments of food intake. Studies involving children and/or families along with parental practices were excluded. Search keywords described behaviours related to food, diet and nutrition, along with terms related to acculturation and (im)migration. Terms that pertained to ethnic and minority groups were omitted. Last, we included keywords related to each European country that defines the context of interest. Finally, 47 articles were retained after the consecutive steps of detecting duplicates, title/abstract screening and full-text screening.
RESULTS
About 9% of the articles described findings from a single multi-site cross-sectional study, and 13% referred to interventions focusing on nutrition-related conditions. About one third of articles provided comparisons with host population, while 25% described nutrition transitions from the birth country. Only 1 study compared migrants with populations in both host and birth countries. While immigrants globally adopt a Western diet, especially meat and sweets, they retain some elements of traditional diets such as high intake of fruits, legumes or tubers. The role of acculturation, primarily assessed through length of residence in host country, has been highlighted in such processes. The role of the food environment in host country has been explicitly addressed in one study only.
CONCLUSIONS
While population-wide shifts in food behaviour have implications for public and planetary health, migrant research than can inform adapted interventions in Europe is scarce. Further research should comprehensively explore the role of acculturation and socio-economic position. In addition, multi-site studies across diverse European settings can clarify the role of the food environment along with characterising differences compared to birth country.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_010

HUMAN MILK METABOLITES MODULATE INFANT INTESTINAL IMMUNE AND BARRIER FUNCTIONS AS WELL AS INTESTINAL MICROBIOTA: IN VIVO STUDY IN YUCATAN PIGLETS

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BACKGROUND AND OBJECTIVES
Human milk (HM) is a complex food that meets the nutritional needs of newborns. It also contains numerous bioactive compounds such as metabolites, present in low concentrations and including short-chain fatty acids (butyrate, acetate, propionate), polyamines (putrescine, spermine, spermidine), gamma-aminobutyric acid and lactate. These metabolites are also known to be produced by the intestinal microbiota and to contribute to the maintenance of intestinal homeostasis. However, their role in HM has been little studied. The aim of this study was to evaluate their bioactive properties on the infant intestinal functions and microbiota, in an *in vivo* model of Yucatan minipigs.
METHODS
Piglets aged 2 days (n=9-10 per group) were fed for 23 days with: (i) a standard infant formula (IF) (CTRL group), or (ii) an IF supplemented with metabolites at HM concentrations (MTB group), or (iii) an IF supplemented with fermented milk fractions (FF group) in order to evaluate the relevance of IF fermentation to provide metabolites. The impact of the diets on intestinal physiology was characterized using *ex vivo* (Ussing chambers), molecular biology (RT-qPCR, ELISA) and histology approaches, and the intestinal microbiota was studied by 16S rRNA gene sequencing.
RESULTS
A principal component analysis of all the variables could separate the MTB and FF groups from the CTRL group. The metabolite-supplemented IF, either MTB or FF, significantly impacted the intestinal immune function, particularly in ileal Peyer's patches: they reduced the expression of both pro-inflammatory (*TNFa)* and anti-inflammatory (*TGFB1* and *IL10Ra)* markers, and the expressions of *FOXP3*, a T cell marker, and *TLR4*. Both the IF resulted in increased secretion of immunoglobulin A (IgA) in the ileum compared with CTRL IF. In the colon, MTB and FF IF increased paracellular permeability, decreased tight junction gene expressions (*CLDN2* and *OCLN*) and increased the depth of crypts. Finally, FF IF decreased microbiota alpha diversity in the caecum and feces of piglets.
CONCLUSIONS
Our study demonstrated that HM metabolites are bioactive and are able to modulate the infant intestinal immune and barrier functions *in vivo*, as well as its intestinal microbiota.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_011

TRENDS IN LOW-CALORIE SWEETENED PRODUCT CONSUMPTION AND ITS ASSOCIATION WITH DIETARY CONSUMPTION OF MINIMALLY PROCESSED FOODS IN UK CHILDREN: A NATIONAL STUDY FROM 2008 TO 2019

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BACKGROUND AND OBJECTIVES
Little is known about the association between low- and no-calorie sweetened (LCS) product consumption and children's diet quality, despite the promotion of these products as sugar alternatives. This study examines the trends and associations between LCS product consumption and intakes of minimally processed foods and beverages (MPFB) and ultra-processed foods and beverages (UPFB) among UK children.
METHODS
Repeated annual cross-sectional data from the National Diet and Nutrition Survey (2008/09-2018/19) for children aged 4-18 years (N=5,922) were analysed. Children were categorized into No-LCS (0%g/day), Low-LCS (≤6.8%g/day), Mid-LCS (6.9-17.4%g/day), and High-LCS (≥17.4%g/day) groups based on a four-day food diary. The trends in consumption of MPFB and UPFB by LCS groups were assessed using multivariable linear regression models, adjusted for sociodemographic factors.
RESULTS
In 2008/09, the percentages of children in the Low-LCS, Mid-LCS, and High-LCS groups were 20.4%, 24.9%, and 25.1%, respectively. The population breakdown of LCS consumption remained largely unchanged throughout study period. In 2008/09, all LCS consumers had a lower intake of MPFB but a higher intake of UPFB compared to the No-LCS group. Consumption of MPFB (0.9%g/day per year; 95%CI: 0.6, 1.1) and water (2.7%g/day per year; 95%CI: 2.2, 3.1) increased in the No-LCS group over 11 years. Similar changes were observed in other LCS groups but were less pronounced in the High-LCS group (vs No-LCS). Moreover, over 11 years, the trend in UPFB intake in the No-LCS group decreased significantly (-0.8%gtotal/day per year; 95%CI: -1.1, -0.6). In comparison, the High-LCS group (vs No-LCS) showed a smaller decline in UPFB intake (0.7%g/day per year; 95%CI: 0.3, 1.1).
CONCLUSIONS
Over 70% of UK children consumed LCS products between 2008 and 2019. LCS product consumption was associated with a smaller increase in the consumption of minimally processed foods and beverages, and water, while it was also associated with a smaller decrease in ultra-processed foods and beverages in children's diets during the study period. These findings highlight the need for a more comprehensive consideration of less processed dietary patterns in UK's healthy eating guidelines, beyond promoting LCS in children's diet.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_013

THE RELATION BETWEEN ANC COUNSELING AND ADHERENCE TO MULTIPLE MICRONUTRIENT SUPPLEMENTS (MMS) IN INDONESIA

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BACKGROUND AND OBJECTIVES

Despite the decades-long Iron and Folic Acid (IFA) supplementation program, anemia remains a significant public health problem. One significant challenge faced by the IFA program in various countries, including Indonesia, is low adherence. In 2020, WHO recommended Multiple Micronutrient Supplementation (MMS) for pregnant women (PW) as a substitute for IFA, in the context of rigorous research. Implementation research is being conducted in Indonesia to provide recommendation to the government in scaling up MMS. As part of the implementation research, healthcare providers (HCPs) received orientation about anemia and MMS, and in some of the study sites were trained with enhanced communication strategy to provide counseling. We conducted an analysis to evaluate the association between MMS counseling and adherence of PW in taking MMS.

METHODS

A survey of PW was carried out in eight districts. Data from PW were collected through home visits that took place on two occasions: (1) at the time of recruitment and (2) three months following recruitment. Data from a total of 1856 PW were analyzed. Adherence was measured by bottle-weighing and PW's consumption control card. Adherence is defined as taking at least 70% of the number of MMS they need to take within 3 months. A counselling index score was generated based on list of items that midwives explained during ANC.

RESULTS

About half of PW (51.3%; n=952) took at least 70% of the eligible 90 MMS tablets (considered as adherent). During their first ANC visit, PW received counseling about 'to take 1 tablet of MMS every day' (81%), 'how to open the bottle' (82.1%), 'how to close the bottle' (62.6%), 'how to fill in the consumption control card' (62.9%), 'MMS ingredients' (55.6%), and 'MMS benefits' (53.2%). Furthermore, the counseling index analysis shows that PW who were counseled on six or more topics during their first ANC were more likely to adhere (take more than 70% MMS tablets) within three months (OR=1.236; 95%CI=1.028 – 1.486).

CONCLUSIONS

Findings demonstrate the importance of counseling about MMS during women's first ANC visit to improve their adherence to taking MMS. This implies that program implementers should formulate health strategies that emphasize the significance of comprehensive nutrition education and counseling in the early stages of pregnancy to enhance adherence to micronutrient supplementation.

CONFLICTS OF INTERESTS

Kristen Hurley: Funding and Materials for the study described in this presentation were provided by the Kirk Humanitarian Foundation and Vitamin Angel Alliance. Dr. Hurley was also a paid consultant (technical advisor) to the Kirk Humanitarian Foundation and has received funding from Vitamin Angels to provide technical oversight to programs team. These arrangements have been reviewed and approved by the Johns Hopkins University in accordance with its conflict of interest policies.

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EPO5_014

LIFESTYLE AND DIETARY HABITS OF HUNGARIAN SEVENTH-DAY ADVENTISTS AND CONTROLS: A PILOT STUDY

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BACKGROUND AND OBJECTIVES
Among members of the Seventh-day Adventist Church, there are several lifestyle factors (vegetarian diet, avoidance of stimulants) in their daily lives that may contribute to longer life expectancy at birth and a higher number of years of healthy life compared to other populations. The objective of this study was to assess the lifestyle and dietary habits of Adventists living in Hungary (HA) and compare them with age-matched controls.
METHODS
In this pilot study the participants completed both a general and a nutritional questionnaire in an anonymous online format. A total of 595 individuals participated in the study (HA: n=382; control: n=213).
RESULTS
The proportion of non-users of stimulants was significantly higher among HAs than in the control group (coffee: 58% vs. 16.9%; alcohol: 96.1% vs. 33.3%; tobacco: 97.9% vs. 73.7%; HA vs. controls; $p<0.001$ each). Furthermore, the HA group exhibited a significantly higher prevalence of a vegan (17.3% vs. 0.5%; $p<0.001$) or vegetarian diet (28.3% vs. 3.3%; $p<0.001$) compared to the control group. In general, individuals in the HA group demonstrated a healthier dietary pattern, characterised by significantly lower average salt, processed food, and animal food consumption. On the other hand, members of the HA group predominantly consumed plant-based foods, whole grain bread, alternative side dishes (e.g., bulgur, millet, brown rice), and alternative sweeteners (e.g., honey, date syrup). In contrast, the control group predominantly consumed white bread, traditional side dishes (white rice, egg pasta) and frequently used sugar. Additionally, low-intensity exercise (51.8% vs. 32.9%; $p<0.05$) and good sleep quality (38.7% vs. 25.4%; $p<0.001$) was more prevalent among those in the HA group.
CONCLUSIONS
Our research has confirmed that the prevalence of vegetarian or vegan diet is higher among HAs compared to the control population. Our findings indicate that Hungarian Adventists adhere to a healthier lifestyle, characterised by the low consumption of stimulants and the use of a diverse range of alternative side dishes and sweeteners.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_015

FACTORS INFLUENCING COMMERCIAL MILK FORMULA USE IN SOUTH AFRICA: A MIXED-METHODS ANALYSIS

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BACKGROUND AND OBJECTIVES
The consumption of commercial milk formula (CMF) continues to increase, despite substantial evidence supporting the benefits of breastfeeding. Although regulated by the International Code of marketing of breastmilk substitutes, CMF marketing often presents CMF feeding as a convenient solution to feeding challenges, influencing mothers' choices.
METHODS
This study presents South African data from a multi-country, mixed-methods study investigating women's exposure to CMF marketing and their perceptions of infant feeding. The study included a cross-sectional survey of 1,050 women (pregnant women, breastfeeding mothers of children under 18 months, and mothers using CMF) in two large South African cities. Participants were selected using convenience sampling stratified by feeding practice and the age of the child. In addition, ten focus group discussions (FGDs) were conducted with pregnant women and mothers of children aged <18 months to explore attitudes toward CMF marketing. Thematic analysis was conducted using NVivo v.12.
RESULTS
Most women planned to breastfeed and received encouragement from health workers; however, breastfeeding challenges, returning to work, and the convenience of CMF feeding were the main reasons for switching to CMF. Social media platforms like Instagram and Facebook were key information sources. Mothers highly regarded health workers' advice. The introduction of formula feeding often had negative effects on the baby's health, prompting mothers to try different brands until they found one they perceived as suitable for their child. Mothers reported that health workers played a role in helping them identify the appropriate brand to use. Family members, particularly grandmothers, played a significant role recommending initiating CMF. Survey data indicated that recommendations for CMF came mostly from family (58.8%), friends (23.3%), and health workers (18.3%). CMF Marketing and word-of-mouth strongly influenced CMF feeding decisions, with television (69.4%) and in-store ads (27.9%) as the most common channels. The majority of women (79.2%) believed that breastmilk is best for babies, and 79.9% agreed that it promotes mother-baby bonding. However, 48.9% thought that formula milk is similar to breastmilk, and 53.2% believed that breastfeeding and formula feeding offer the same benefits (Table 1).
CONCLUSIONS
The study highlights the multifaceted factors driving CMF consumption in South Africa, suggesting the need for targeted public health strategies to promote breastfeeding and provide mothers with accurate, supportive information for informed feeding choices.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_016

MATERNAL VITAMIN B12 STATUS AND RISK OF SGA IN WOMEN WITH A HISTORY OF METABOLIC BARIATRIC SURGERY

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BACKGROUND AND OBJECTIVES
More than half of all metabolic bariatric surgeries are performed in women of childbearing age, after which there is an increased risk of small-for-gestational age infants. Low maternal vitamin B12 has been suggested as a contributing factor to this increased risk, with a potential modifying role of folate status. Therefore, we investigate the association between maternal vitamin B12 status and risk of delivering a small-for-gestational age infant in women with a history of metabolic bariatric surgery, while exploring the potential modifying role of folate status.
METHODS
Multicenter observational cohort study including 125 pregnant women with a history of metabolic bariatric surgery. Linear mixed models and Cox proportional hazard regression models were used to analyze the association between delivering a small-for-gestational age infant (n=19, 15%) and plasma vitamin B12 status over the course of pregnancy as well as per trimester. Effect modification by serum folate was tested by adding interaction terms to the respective models.
RESULTS
Mean plasma vitamin B12 levels significantly decreased over the course of pregnancy, with plasma vitamin B12 levels being lower in the small-for-gestational age group compared to the non-small-for-gestational age group (247 pmol/L (95% CI 155-338 pmol/L) vs 352 pmol/L (95% CI 303-400), p=0.02). In the first and second trimester, women with high plasma vitamin B12 levels had a 70-77% lower risk of delivering a small-for-gestational age infant compared to women with low vitamin B12 levels (RR T1 0.23 (95% CI 0.07-0.70), RR T2 0.30 (95% CI 0.10-0.92). In the third trimester high vitamin B12 was associated with a reduced risk of small-for-gestational age among women with high folate levels (RR 0.22 (95%CI 0.05-1.03). In contrast, for women with low folate levels, there was no association between maternal vitamin B12 and small-for-gestational age (RR 2.44 (95% CI 0.43-13.82).
CONCLUSIONS
This study indicates an inverse association between high maternal vitamin B12 and risk of small-for-gestational age infants in pregnant women with a history of metabolic bariatric surgery, especially in case of high folate status. Future research should further identify whether there is a sensitive window of exposure during which maternal vitamin B12 status may be more strongly related to the risk of delivering a small-for-gestational age infant while incorporating the effect of supplementation, functional markers of vitamin B12 and appropriate measures of fetal growth.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_017

RELATIVE VALIDITY OF A QUESTIONNAIRE-BASED SIX-ITEM ASSESSMENT OF SELF-REPORTED HABITUAL MAIN MEAL FREQUENCY AND TOTAL MEAL FREQUENCY

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BACKGROUND AND OBJECTIVES
Frequency and timing of eating are suggested to have implications for health, but further investigation is needed to reach consensus (Svendsen & Forslund, 2024). Adequate and valid tools for assessing meal patterns are essential for the relevance of RESULTS from the emerging field of chrono-nutrition (O'Connor, 2024). Commonly used tools for evaluating meal frequency, such as food records (FR), are time consuming and expensive, and validated cost-effective tools are called for (Phoi, 2022). Therefore, we aimed to evaluate the relative validity of a 6-item assessment of meal frequency included in a Food Frequency Questionnaire (FFQ) used in two large prospective cohorts (Harris, 2013), compared to repeated 3-day FRs. To our knowledge, this is the first study to attempt to validate such a tool.
METHODS
The FFQ and 3-day FRs were collected (one and five times, respectively) in a previously conducted 15-week intervention study (NCT03821116) of Swedish men and women, aged 40-74 (n=74). FFQ-reported *total meals/day* and *main meals/day* (breakfast, lunch, dinner) were compared to FR-reported estimates (mean of 15 days). A Wilcoxon signed rank test was performed to determine the median difference between FFQ and FR-reported main meals/day, and a paired sample t-test was used to determine the mean difference between total meals/day.
RESULTS
No statistically significant difference was found between the FFQ and FR reported main meals/day ($p = 0.82$). The median was 3.0 (IQR = 0) for the FFQ, and 2.9 (IQR = 0.2) for FRs. The mean difference between total meals/day reported from FFQ (3.94 (SD = 1.07)) and FRs (4.39 (SD = 0.73)) was 0.44 ($p = 0.0003$).
CONCLUSIONS
Our RESULTS support the FFQ-based six-item assessment as a valid tool for estimating frequency of main meals/day. Although, the mean difference for FFQ and FR-based estimates of total meals/day was statistically significant, the absolute difference was modest. These preliminary RESULTS will be followed by further investigations into possible reasons for the differences, providing insights for further improvements in meal frequency assessment, valuable for future research on meal patterns and health implications.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_018

SOCIO-DEMOGRAPHIC AND NUTRITIONAL PREDICTORS OF ADEQUATE IRON INTAKE IN WOMEN OF FERTILE AGE

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BACKGROUND AND OBJECTIVES
Adequate iron intake is essential for women of childbearing age; it can play a critical role in preventing anemia, supporting reproductive health, and ensuring optimal outcomes for the well-being of mother and child. Socio-demographic factors (level of education, income, and living environment) significantly influence food choices and access to iron-rich foods. Also, the quality of the diet and the awareness of the recommended dietary practices shape the food patterns.
METHODS
Our research investigated factors influencing adequate iron intake among a sample of 251 women of childbearing age. The analysis focused on socio-demographic variables (education, income, living environment), dietary patterns, diet quality index (DQI), and anthropometric indicators (pregestational BMI and weight gain during pregnancy).
RESULTS
Our RESULTS indicated that only 15.5% of participants had an adequate iron intake, with significant differences according to education level (χ^2=8.49, p=0.004, OR=2.212, CI=1.015–4.817) and the quality of the diet (χ^2=6.23, p=0.013, OR=2.251, CI=1.002–5.056). Multiparity and dietary patterns did not significantly predict iron adequacy. Logistic regression confirmed that education (OR=2.21, CI=1.015–4.817) and DQI (OR=2.25, CI=1.002–5.556)were key predictors of adequate iron intake, highlighting the importance of nutritional literacy and diet quality in addressing micronutrient deficiencies.
CONCLUSIONS
Our findings emphasize the need for targeted interventions to improve diet quality and nutrition education. These determinants highlight disparities in nutritional health and the need for tailored interventions aimed at improving iron intake among women of childbearing age, thereby reducing the prevalence of iron deficiency and associated health risks.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_019

PARTICIPATORY INSIGHTS: UNDERSTANDING ADOLESCENT FOOD CHOICES AND ENVIRONMENTS IN ETHIOPIA AND VIETNAM

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BACKGROUND AND OBJECTIVES
Adolescence is marked with significant biological and psychosocial growth and development, heightened nutrient needs and increasing autonomy in diets and eating habits. Yet many are at risk of malnutrition including micronutrient deficiencies, and overnutrition. Improving adolescents' food environments and diets requires understanding their values and interactions within their (changing) food environments. This study explored and compared adolescent's food environments in Ethiopia and Vietnam and their interactions.
METHODS
The qualitative study applied a participatory video making approach conducted across multiple sites with varying levels of urbanization, 3 districts in Vietnam and 2 woredas in Ethiopia. Adolescents aged 15-17 years (52 in Vietnam and 36 in Ethiopia), identified through purposively selected secondary schools, participated in a series of activities, with girls and boys in each site producing separate videos. Qualitative data comprised of workshop transcripts and videos (7 in Vietnam and 4 in Ethiopia) were analyzed using MAXQDA software using open coding, within the food environment dimensions: availability and accessibility, outlet properties, prices and affordability, product properties, marketing and desirability and knowledge. RESULTS were compared across the two countries.
RESULTS
In addition to food at home, adolescents had access to various types of food outlets, located within and near their schools and homes, that provided a wide range of both healthy and unhealthy food options, with a wider range of processed and ultra-processed foods in Vietnam. Foods were chosen based on the available budget, often opting for the cheaper, tastier and convenient options even if less nutritious. Engagement was varied, with more distinct differences between boys and girls in Ethiopia. Participation was extensive from farming, harvesting, shopping, preparation, to serving. Adolescents showed varying nutrition knowledge including some misinformation. Eating together in social settings was common in both countries but with some differences between boys and girls. Further analysis ongoing.
CONCLUSIONS
As adolescents navigate their unique cultural and social contexts, their food choices are influenced by a complex interplay of factors, including accessibility, affordability, messaging, knowledge and peer dynamics. Significant variations in the food environments of the two countries were noted but not as much between sites. Interventions must consider these contextual factors and actively engage adolescents alongside other food system actors in strategies that enhance the food environments and diets.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_020

PREVALENCE AND DETERMINANTS OF VITAMIN D DEFICIENCY AMONG REPRODUCTIVE-AGE WOMEN IN LEBANON

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BACKGROUND AND OBJECTIVES

Vitamin D is a prohormone and an essential nutrient for various body functions and is produced endogenously during exposure to ultraviolet light. Vitamin D deficiency is a significant global public health problem and high prevalences have been found in multiple countries in the Middle Eastern region despite abundant sunshine. In this study, we aimed at assessing the prevalence of vitamin D deficiency among reproductive-age women living in Lebanon and uncovering the most important context-specific leading factors.

METHODS

A nationally representative cross-sectional study was conducted in 2023 in Lebanon. Household- and individual-level demographic data was collected, along nutritional and metabolic blood biomarkers. Serum vitamin D was analyzed on the same day of data collection, and vitamin D deficiency was defined as serum vitamin D concentration was below 30 nmol/L (12 ng/mL). Risk factors of vitamin D deficiency were identified using bivariate analyses, and indicators with a p-value <0.2 in the bivariate analysis were subsequently included in the multi-variable Poisson regression model. Indicators with a p-value <0.05 in the regression model are reported below.

RESULTS

A total of 2803 non-pregnant women aged between 15 and 49 years old were recruited, with a median age of 33.5 years. The weighted median serum vitamin D was 37.3 nmol/L, and the prevalence of vitamin D deficiency was 37.9%. The RESULTS from the multivariable model found that veiling and vitamin D supplementation were the most prominent risk factors of vitamin D deficiency. The prevalence of vitamin D deficiency was significantly higher in veiled women (adjusted prevalence ratio (aPR) 3.8, 95%CI: 3.1, 4.6) and significantly lower in those who consumed vitamin D supplements in the past 6 months (aPR = 0.30 [0.24,0.39]). Vitamin D deficiency was significantly higher in the younger age group (15-19 years), those in lower wealth quintile households, and those with lower educational levels. The prevalence of vitamin D deficiency was 14% to 28% higher in women with darker skin color, while it was 16% lower among those with greater than one hour of sun exposure per day. The deficiency was higher in women with anemia, vitamin B12 deficiency, and low HDL cholesterol, but lower in women with elevated triglycerides.

CONCLUSIONS

In a country where the sun shines more than 300 days a year, the prevalence of vitamin D deficiency is higher than global estimates. National strategies, such as promotion and distribution of vitamin D supplements, are needed, particularly among veiled women.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_022

INFANT FEEDING DURING THE FIRST YEAR OF LIFE IS ASSOCIATED WITH BMI IN CHILDHOOD IN A NATION-WIDE COHORT STUDY FROM PREGNANCY TO CHILDHOOD

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BACKGROUND AND OBJECTIVES
Ensuring proper nutrition during the first year of life is crucial for both short and long-term population health, including prevention of overweight and obesity. We aimed to assess associations between: (I) the status of exclusive breastfeeding (**EBF**) at 3 months, (II) a novel Infant Diet Score (**IDS**) describing overall diet 0 - 12 months, with overweight and obesity in a nation-wide cohort of children.
METHODS
Data obtained from health records on 30,623 children born 2009-2015 in a Nordic country included demographics, birth and maternal factors; infant feeding 0-12 months recorded regularly; and weight/height measurements at 2.5, 4, 6 and 9 years. The IDS was composed by duration of EBF and any breastfeeding; age of cow's milk and semisolids/solid's introduction; estimate of food variety and vitamin D supplement use, a higher score representing greater alignment with nutrition recommendations. Anthropometric data was converted to BMI-for-age z-scores by using the WHO Child Growth Standards/References and their cut-offs used for overweight/obesity. We tested associations using logistic regression and odds ratios adjusted (aORs) for birth weight, residency, pre-pregnancy BMI, maternal age, maternal employment and parental cohabitation.
RESULTS
Compared with children who were EBF at 3 months, children who were not EBF, had higher odds of obesity at 6 years (aOR:1.44; 95% CI:1.24-1.67) and 9 years (aOR:1.36; 95% CI:1.16-1.59). Compared with children who were in the highest IDS quintile 0-12 months, children in the lowest IDS quintiles (1st and 2nd) had increased odds of obesity at 6 (aOR:1.50; 95% CI:1.11-2.04), (aOR:1.55; 95% CI:1.54-2.08) and 9 years (aOR:1.41; 95% CI:1.05-1.90), (aOR:1.50; 95% CI:1.12-2.02). We found no associations between IDS quintiles and overweight/obesity at 2.5 and 4 years.
CONCLUSIONS
Children not EBF at 3 months and children with lower alignment to infant feeding guidelines were more likely to be categorized as obese at six and nine years of age. This study underlines the importance of ensuring good nutrition during the first year of life for the primary prevention of obesity.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_023

REASONS WHY CHILDREN AREN'T SUPPLEMENTED: A LOOK AT A COUNTRY SOUTH OF THE SAHARA IN AFRICA

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BACKGROUND AND OBJECTIVES

In 2024, Helen Keller supported vitamin A supplementation (VAS) for children aged 6-59 months in Guinea, aiming for at least 80% coverage and effective implementation. It conducted a coverage survey following distribution in the first half of this year. This study aims to identify why children do not benefit from this supplementation.

METHODS

Data comes from the post-campaign coverage survey administered to caregivers of children aged 6-59 months in the six regions supported by Helen Keller International. This survey used a WHO (2015) stratified cluster design that drew 115 clusters. A total of 1,378 households and 1,527 childminders were interviewed.

RESULTS

Of the 2,007 children involved, 1,698 were supplemented, representing 84.6%; 255 were not supplemented, or 12.7% and the status of 54 children was unknown, representing 2.7%. The main reasons identified included parents' lack of information about the campaign (90.6%), refusals due to cultural beliefs and misperceptions (6.7%), and 2.7% cases of illness. In addition, shortcomings in the close follow-up of teams were noted.

CONCLUSIONS

The RESULTS suggest that it is crucial to strengthen communication and community mobilization to improve vitamin A supplementation coverage, notably by providing sufficiently early information on the campaign period and organizing awareness campaigns. It is also important to correct misperceptions about vitamin A.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_024

MIGRANTS AND FOOD SECURITY AT SANTIAGO FROM CHILE: A STUDY OF SOCIO-URBAN BARRIERS AND FOOD DESERTS

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BACKGROUND AND OBJECTIVES
Food security has become a growing challenge in Chile. 41.5% of migrants in Santiago do not have enough food due to lack of money, and 32.5% do not eat healthy food due to lack of food. This is a critical situation for migrants, who face greater difficulties accessing adequate food.
To explore the existence of urban access barriers to healthy food services, in terms of proximity and their impact on the food security of the migrant population in the Metropolitan area.
METHODS
A comparative spatial distribution analysis and subsequent clustering were carried out using 2017 census data and OpenStreetMap, identifying the distribution of migrants and their access to markets and supermarkets in urban areas. A food desert index was constructed, determining the distance from homes to healthy food outlets at more than 1,500 meters. A cluster analysis technique was applied and migrant density was related to access to nutritious food.
RESULTS
Four clusters were identified that combine migration density and access to healthy food stores (Figure 1). The availability of street markets and supermarkets (Figure 2) indicates that migrants tend to focus on urban areas with available services, influenced by accessibility and the relatively low cost of housing. However, the main barriers become economic since limited purchasing power restricts migrants' ability to acquire healthy foods, leaving them in food insecurity.https://drive.google.com/file/d/1nbgBe_43YwTCyQ7GQvaimTwEsELmTXBC/view?usp=sharing
CONCLUSIONS
Migrants are vulnerable from a food point of view despite being located in urban areas with greater access to services due to their economic limitations.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_025

WEIGHT CONTROL BEHAVIOURS AMONG SERBIAN ADOLESCENTS AND THEIR RELATIONSHIP WITH BODY IMAGE - DATA FROM HEALTH BEHAVIOUR IN SCHOOL-AGED CHILDREN SURVEY 2022

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BACKGROUND AND OBJECTIVES
Adolescence is considered risk period for weight gain due to intensive hormonal and metabolic changes, but also changes in eating behaviours. Some adolescents perceive their physical appearance to be quite different from their actual body weight and consequently start practicing different behaviours aiming at weight control. Although many adolescents seek professional help to lose weight, some use fasting, vomiting, and laxatives as ways to control their weight. The aim was to assess adolescents' weight control behaviours and their relationship with the body image.
METHODS
Secondary analysis of data obtained from the Health Behaviour in School-aged Children Survey (HBSC) in Serbia 2022 were used. Survey was conducted as a cross-sectional study on a nationally representative sample of adolescents aged 11, 13 and 15 years. In this study only data for adolescents aged 13 and 15 were analyzed. Participation was anonimous and voluntary following the methodology of the standardized international study protocol.
RESULTS
According to body mass index (BMI), 7.6% of adolescents aged 13 and 15 in Serbia were underweight, while 10.5% were overweight and 2.6% were obese. One sixth of adolescents (17.4%) were on a diet at the time of study, 10.6% of adolescent were on a diet or doing something else to control weight in the last 12 months, while 21.2% of them were different times on a diet in the last 12 months. Boys and girls who perceived themselves fat were more likely to practice different behaviours for weight control, more often unhealhty behaviours such as fasting (12.8%) or smoking more (7.5%). Only 5 % of respodents dieted under professional supervision.
CONCLUSIONS
Considering the health risks associated with the way adolescents perceive their weight, especially related to weight control behaviours, identification and monitoring of these behaviors is necessary. In order to avoid harm to health it is important to raise the awareness of doctors in primary health care and design interventions aimed at improving adolescent nutrition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_027

STRUCTURE AND UNSTRUCTURED FOOD INTAKE IN THE DOMESTIC ENVIRONMENT

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BACKGROUND AND OBJECTIVES
Food cycles in the domestic environment make use of structures - more or less stable - so that the multiple processes required for feeding can take place. In other words, there is an organization, relatively constant over time, involving the acquisition, preparation, consumption and disposal of food. The anthropological perspective in combination with the nutritional perspective provides an in-depth analysis of the organization, distribution and regularity of daily food consumption practices in households, in a context in which malnutrition by excess has taken on a worrying preponderance at national and global level.
Objective: To identify the structures of daily food intake in households of low socioeconomic level in the city of Santiago-Chile.

METHODS
Ethnographic, based on observations and semi-structured interviews conducted between 2020 and 2021 in 24 low-income households in Santiago, Chile.

RESULTS
Four types of daily intakes are described, categorized according to their relevance, periodicity, composition and visibility. Discrepancies were evidenced between an idealized dietary structure, on which nutritional recommendations are based, and concrete feeding practices, where schedules are shifted, certain intakes are suppressed, others are duplicated and new feeding styles, previously unidentified, emerge.

CONCLUSIONS
The findings showed 2 patterns of food consumption, one structured and visible and another unstructured, which does not have a defined location in time and space. The latter constitutes a strong obstacle to a healthy diet and may be a potentiator of overweight and obesity in the group studied

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_029

INFLUENCE OF SOCIAL AND PHYSICAL FOOD ENVIRONMENT ON THE DIETARY INTAKE OF ADOLESCENTS (10-19 YEARS) IN DELHI, INDIA

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BACKGROUND AND OBJECTIVES
Food choices are influenced by the food environment. This study aimed to understand the physical & social food environment of adolescents and its relationship with their consumption of fruits and vegetables, foods high in fat, salt, & sugar (HFSS), and sugar sweetened beverages (SSBs). Insights regarding the interplay of food environment with food choices can inform policymakers regarding strategies for promoting diets amongst this age group.
METHODS
This cross-sectional observational study included 632 adolescents aged 10-19 years from four private schools in Delhi, India, selected through non-probability purposive sampling. Information on home food availability, accessibility, parent modelling, family food rules and habits, involvement in cooking, and dietary intake was assessed using a pre-tested questionnaire. Data was analysed using Chi-square/Fisher's exact test and linear regression, with a level of significance set at $p<0.05$.
RESULTS
The regular (more than three times a week) availability of different unhealthy foods and SSBs at home significantly increased their consumption ($p<0.001$). Adolescents consumed more fruits and vegetables when parents regularly cut and made these accessible as snacks ($\beta=0.63$, $p<0.001$) and when parents modelled healthy eating behaviours ($\beta=0.24$, $p<0.001$). Interestingly, adolescents who regularly assisted with food preparation at home had higher consumption of fruits and vegetables ($\beta=0.37$, $p<0.001$) as well as HFSS foods and SSBs ($\beta=0.29$, $p=0.011$). Eating dinner with family regularly while watching television or using a screen was positively associated with the consumption of HFSS foods and SSBs ($\beta=0.53$, $p<0.001$) and negatively with fruit and vegetable intake ($\beta= -0.24$, $p=0.008$). Adolescents who were regularly expected to eat all vegetables served, even if they did not like them, showed a positive association with fruit and vegetable intake ($\beta=0.55$, $p<0.001$) and a negative association with HFSS food and SSB consumption ($\beta= -0.26$, $p=0.047$). Among the majority of adolescents (72.2%), the most trusted and reliable source of information about what to eat or avoid was the family.
CONCLUSIONS
Intervention strategies should aim to promote healthier food choices among adolescents by increasing the household availability and accessibility of nutritious foods while limiting unhealthy options. Encouraging adolescents to participate in healthy meal preparation with parents may foster better dietary decisions. Parents should act as role models for their children and also encourage mindful eating during family meal times.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_030

DETERMINANTS OF ANEMIA, IRON DEFICIENCY, HEMOGLOBIN, AND SERUM FERRITIN IN THAI INFANTS AGED 6 MONTHS

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BACKGROUND AND OBJECTIVES
Anemia during infancy is widespread in low- and middle-income countries, significantly impairing physical and cognitive development. Identifying its underlying causes is crucial for developing effective intervention strategies. This study aimed to determine factors affecting anemia, iron deficiency, hemoglobin level and serum ferritin level in infants aged 6 months.
METHODS
This study included baseline data from 287 healthy, full-term infants aged 6 months who participated in a double-blinded, randomized controlled trial. Outcomes assessed at 6 months included anemia prevalence, iron deficiency, hemoglobin levels, and serum ferritin levels. Multivariate binomial logistic regression was used to analyze the relationship between factors associated with anemia and iron deficiency. Multiple linear regression was used to analyze the relationship between factors associated with hemoglobin levels and serum ferritin levels.
RESULTS
The proportions of anemia and iron deficiency among 6-month-old infants in this study were 18.1% and 5.0%, respectively. One standard deviation (SD) higher in weight-for-age Z-scores was associated with a lower risk of anemia (adjusted odds ratio [aOR] 0.56, $p = 0.010$). An increase of 1 µmol/L in retinol-binding protein (RBP) level was associated with a lower risk of iron deficiency (aOR 0.01, $p = 0.030$). Further analysis showed that higher weight-for-age Z-scores were significantly associated with higher hemoglobin levels ($\beta = 0.14$, $p = 0.026$), while higher RBP levels were associated with higher serum ferritin levels ($\beta = 30.63$, $p = 0.011$).
CONCLUSIONS
Better growth was significantly associated with a lower risk of anemia and higher hemoglobin levels, while adequate vitamin A status was linked to reduced iron deficiency and increased iron stores. These RESULTS underscore the critical roles of good nutrition and adequate vitamin A in preventing anemia and iron deficiency in infants.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_031

BODY COMPOSITION CHANGES IN INDONESIAN CHILDREN DURING TREATMENT OF SEVERE ACUTE MALNUTRITION WITH A LOCALLY PRODUCED READY-TO-USE THERAPEUTIC FOOD ARE MODULATED BY PRE-BIOTIC RICE BRAN: A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
Current formulations of ready-to-use therapeutic foods (RUTFs) to treat severe acute malnutrition (SAM) focus on nutrient quantity and do not give due attention to their impact on the intestinal microbiome or body composition in children treated for SAM. This study aimed to assess the efficacy of daily RUTF administration with rice bran (RUTF+) compared to RUTF without rice bran (RUTF-) on body composition indicators.
METHODS
A total of 200 children aged 6–59 months with uncomplicated SAM (weight-for-height z-scores (WHZ) <−3, and/or mid-upper arm circumference (MUAC) <115mm, and or having bilateral pitting oedema +/++), or approaching SAM (WHZ<−2.5) were enrolled in a double-blinded, randomized controlled trial. Children received either a locally produced RUTF, or the same RUTF with 5% rice bran for 8 weeks of treatment, followed by 8 weeks of monitoring. Anthropometric data, including weight, height, mid-upper arm circumference and skinfold measurements at 4 points (biceps, triceps, subscapular and supra-iliac), were collected monthly. Body composition outcomes analyzed were Body Fat Percentage (BFP), Fat Mass (FM), Fat-Free Mass (FFM), the ratio of Abdominal vs. Peripherical skinfolds, and singular skinfolds. Linear mixed models were applied across all ages and split by age group (6-23 months and 24-59 months) at weeks 0, 4, 8, 12, and 16 for per protocol analysis (PP).
RESULTS
Weight, MUAC and FFM increased significantly in both treatment arms over treatment and post-treatment follow-up, but with significant differences between age groups. During treatment, in children 6-23 months old, increases in fat-free mass were greater in the RUTF+ group (+208 g and +297 g for week 4 and 8 respectively) as compared to RUTF- at 4 and 8 weeks (+146g and +212g ; $p<0.05$). Fat mass increases rapidly in the first 4 weeks (+248g) but hardly between 4 and 8 weeks (+25g). Increases in fat mass from the start of treatment tended to be greater in the RUTF+ group at 4 and 8 weeks (+276g and 311g) than in the RUTF- group (+190g and + 198g, respectively; $p=0.06$). In older children, there were no significant differences in FFM or FM between the two groups during treatment. MUAC was greater in the RUTF+ group than in the RUTF- group at week 4 (+1.8 mm) and week 8 (+1.7 mm), but differences were not statistically significant.
CONCLUSIONS
This study suggests that rice bran, a known pre-biotic, modulates the impact of RUTF on the accumulation of fat and lean mass during SAM treatment, with a tendency towards greater effect in younger children, whose microbiome is not yet mature.
CONFLICTS OF INTERESTS
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EPO5_033

HOW AND WHY CAN A “CASH PLUS” PROGRAMME IMPACT ON FOOD INSECURITY AND WELL-BEING OF VULNERABLE HOUSEHOLDS IN FRANCE? A PROGRAMME IMPACT PATHWAYS ANALYSIS

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BACKGROUND AND OBJECTIVES
The French “Passerelle Plus” programme seeks to reduce food insecurity of vulnerable households while avoiding some issues of the current food aid system (e.g. stigmatization, lack of choice). The programme comprises three components, i.e. households are offered unconditional cash transfers (CT) along with social orientation and a workshop on sustainable diets. While a randomized controlled trial assesses the programme’s impact as a whole, a process evaluation seeks to elucidate the “how” and “why” of the programme. The present study describes the development of the Programme Impact Pathways (PIP) that is embedded into the process evaluation of “Passerelle Plus”.
METHODS
A PIP analysis bridged the implementation and evaluation aspects by outlining the theoretical chain of causality for programme impact. In two workshops, implementers of the different programme components (n=6 NGO members/social workers; n=2 nutritionists, respectively) shared their understanding of the programme and its objectives. Using coloured papers and arrows, they visualised the programme’s processes throughout the “inputs–process–outputs–outcomes–impacts” flow, thus linking each activity to specific outcomes. Using the visual aids, participants were able to share their views on barriers and facilitators of implementing such a programme in disadvantaged settings.
RESULTS
Three impact pathways pertaining to the three programme components were identified through their synergies. For example, access to financial means may directly address the issue of food insecurity and well-being linked to poverty. During the workshops, dignity of recipients was identified as a key facilitating factor which is related to freedom of choice on what to spend the CT and the non-dependence on food aid. Moreover, social workers provide tangible support in guiding households through administrative formalities to access social rights, which can further increase financial access through housing or other benefits. Last, the nutrition workshop builds on the group sharing concrete sustainable food practices including food budgeting. Identified barriers were lack of facilities and problems with CT distribution, along with recipients’ time availability and French language skills.
CONCLUSIONS
The identified impact pathways build on the synergies across programme components, and provide insights into the ‘"black box" of a complex “Cash-Plus” programme. As such, PIP analysis is the first step that defines the key research questions and data collection methods of the process evaluation.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_035

BARRIERS AND FACILITATORS TO ADOLESCENTS SEEKING MANAGEMENT OF SMALL AND NUTRITIONALLY AT-RISK INFANTS UNDER SIX MONTHS AND THEIR MOTHERS (MAMI) SERVICES IN SOMALILAND

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BACKGROUND AND OBJECTIVES

Globally, adolescent childbearing (10-19 years) poses significant health risks for mothers and their infants, including complications during pregnancy, poor birth outcomes, and increased vulnerability to malnutrition. The MAMI Care Pathway provides targeted support to nutritionally infants under six months and their mothers. We explored barriers and facilitators to adolescents access to and use of MAMI services in Somaliland, to inform program adaptations to improve service reach and responsiveness. Enrollment in MAMI often takes place in facilities, however 78.2% of adolescents don't deliver in a facility and only 29.6% attend antenatal care services.

METHODS

The qualitative study in Somaliland included in-depth interviews (pregnant adolescents and adolescent mothers), focus group discussions (adolescent mothers, male partners, older female relatives and community health workers, (CHWs)) and key informant interviews (service providers).

RESULTS

Adolescents face multiple barriers to health services access including care seeking uncommon unless the baby or mother appeared or felt sick, fears and anxieties of adolescent clients, cost of transport, distance to health facilities, beliefs and behaviors of family and poor quality of services. Facilitators include support from CHWs and physical accompaniment to services, husbands expressed desire to support their adolescent wives, adolescents perceiving CHWs and health workers as a source of information and positive experiences with MAMI staff. Vaccination services were frequently mentioned by respondents as a valuable health service. Awareness of MAMI services among adolescent mothers is low, and many rely on information from older mothers.

CONCLUSIONS

The study concludes that tailored interventions are needed to find adolescent clients to strengthen inclusion in MAMI in Somaliland. Recommendations include strengthening community outreach to improve awareness about MAMI and related health and nutrition services along the continuum of care, increasing community-level screening activities, engaging family members in discussions about the importance of health services for adolescent mothers and their <6 months infant and when to attend, and incorporating respectful care content into MAMI training. Additionally, integration of MAMI screening into vaccination services presents an opportunity to reach adolescents. These adaptations aim to improve the reach and effectiveness of the MAMI Care Pathway.

CONFLICTS OF INTERESTS

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EPO5_036

FACTORS INFLUENCING EXCEPTIONS TO A VEGAN DIET

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BACKGROUND AND OBJECTIVES
A vegan diet excludes all animal products. Adhering to this choice can be challenging in daily life, as the consumption of animal-based foods is deeply ingrained in societal norms. This deviation from the norm often RESULTS in stigmatisation, making the choice even more difficult. Furthermore, some vegans occasionally make exceptions to their diet, particularly in situations where vegan alternatives are not available.
This prompts the research question: How frequently do vegans make exceptions, and what factors influence these exceptions?
METHODS
A standardised online questionnaire was used to collect data about the vegan diet, food consumption frequencies and various reasons and frequencies of the exceptions to the vegan diet. The study population comprised individuals affiliated with a university, including both students and faculty members, as well as individuals from vegan facebook groups. Participants were required to adhere to a vegan diet. The data was analysed univariate, bivariate and multivariate using IBM SPSS Statistics Version 28.
RESULTS
389 vegans took part in the study. Of these, 76.7 % were female, 19.0 % male and 2.3 % diverse, with an average age of 26.6 years. 51.8 % of the participants chose a vegetarian dish in a restaurant when no vegan option was available. 23.4 % of the participants ate animal-based foods at home, 68.0 % when travelling, 51.2 % on special occasions (weddings), 66.4 % when the food would otherwise be thrown away, 29.7 % to avoid uncomfortable situations and 47.0 % when others are cooking. 30.8 % of the participants deviated from the vegan diet, when eating with people who are not vegan, but only 4.1 % when eating with other vegans. 70.6 % of the participants often or always brought vegan dishes to celebrations.
CONCLUSIONS
For some vegans wasting food is worse than eating it. From an environmental perspective, food waste is a major problem, especially when it concerns animal-based products. The increased consumption of animal-based foods by eating with non-vegans could be due to social desirability and a sense of belonging. It is clear from the data that many self-reported vegans do not follow a strict vegan diet and this should be taken into account in future public health interventions. Definitions for the diet could be useful, especially for the question of the type of diet, as the diet is interpreted very individually. In addition to strict vegans, the term default veganism or flexigan could be included for vegans with exceptions.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_037

SCREEN USE AT MEALTIME AMONG CHILEAN CHILDREN AGED 2 TO 15 YEARS

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BACKGROUND AND OBJECTIVES
The World Health Organization (WHO) recommends the use of screens and electronic devices for no more than one hour per day in children aged 2 to 5 years. Screen use during meals has been associated with adverse consequences on physical, social and emotional outcomes in childhood. We described screen use at mealtime among children between 2 to 15 years.
METHODS
Six hundred parents of children aged 2 to 15 years were surveyed during May to June in 2024. Sociodemographic information was collected, and questions about screen use during meals were evaluated. We performed logistic regression analysis to determine the associations between sociodemographic variables and screen use at mealtime.
RESULTS
Most surveyed participants were mothers (65.8%; n=395), with an average age of 37.6 ± 9.2 years. Of the children, 50.3% were boys and 49.7% were girls. The age distribution was 33.5% were aged between 2 to 5 years, 43% were between 6 to 12 years, and 23.5% were between 13 to 15 years. Parents reported that almost a third (29.3%) of children used screens while eating. In the logistic regression models, younger children were more likely to use screens during meals than older children. Specifically, after adjustments for the child´s sex and socioeconomic status, the odds ratio (OR) relative to children aged 13 to 15 years was as follows: OR= 2.06; 95% CI: 1.23 to 3.46 for children aged 2 to 5 years, and OR= 2.00; 95% CI: 1.21 to 3.32 for children aged 6 to 12 years.
CONCLUSIONS
Our study highlights that younger children are more likely to use screens during meals compared to older children. This finding emphasizes the need for targeted interventions to address screen use among younger age groups, considering the potential adverse effects on their health and development.
CONFLICTS OF INTERESTS
Angelo Liberona is NHW Specialist Senior at Nestlé Chile

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EPO5_038

EXPLORING HOW TO SCALE UP PROGRAMMING AROUND INFANTS AT RISK FOR POOR GROWTH AND DEVELOPMENT, ADOLESCENT NUTRITION AND CARE GROUPS IN UGANDA: NOVEL IMPLEMENTATION RESEARCH FINDINGS

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BACKGROUND AND OBJECTIVES
This implementation research unpacks key issues, and the way forward for operationalizing national programming for infants at risk for poor growth and development and improving upon current adolescent nutrition and Care Group programming in Uganda
METHODS
The study triangulated in-depth interviews (IDIs) with 15 government stakeholders and implementing partners, 30 health providers, 30 mothers, and 6 care group promoters, alongside 6 focus groups discussions (FGDs) with care group implementers, and 12 FGDs with adolescent boys and girls, 10-19 years of age in West Nile, Karamoja and Kampala, Uganda.
RESULTS
Our preliminary findings present challenges and opportunities for introduction of programming around infants at-risk for poor growth and development- inclusive of insights on screening and assessment, services targeting maternal mental health, the need to address breastfeeding challenges. The prevention of growth faltering for infants that have the potential for moderate and severe wasting is highlighted. For adolescent nutrition, data on how peer and parental influences, the broader school feeding environment as well as how cultural and social norms affected dietary intake and food choice will be presented. Leveraging on existing Care Groups – as an important platform for improving nutrition practices will be discussed- from a feasibility and sustainability perspective.

CONCLUSIONS
Addressing gaps pertaining to community and facility service delivery for infants at risk for poor growth and development, as well as adolescent nutrition and Care Groups are key for sustainable country programming. This should include strengthening provision of practical support for maternal and infant health, including addressing breastfeeding challenges and maternal mental health, as well as existing social, cultural and gender norms.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_039

INCLUSION OF FOOD BIODIVERSITY THROUGH INDIGENOUS PEOPLES AND TRADITIONAL COMMUNITIES IN PUBLIC FOOD PROCUREMENT: A CASE STUDY IN EASTERN AMAZON

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BACKGROUND AND OBJECTIVES

Food biodiversity is threatened by the homogenisation of global food systems that promote monotonous diets, and drive biodiversity loss, food insecurity and climate change. Indigenous Peoples and traditional communities play a crucial role in this context, as their biocultural diversity inherently integrates knowledge and practices that enhance nutrition, strengthen resilience, and build adaptive capacity. Incorporating this ancestral knowledge into public food procurement can transform food systems, promoting sustainability and inclusion. This study analyses the inclusion of food biodiversity and the participation of Indigenous Peoples and traditional communities in public procurement in a region of the Eastern Amazon, Brazil. This study analyses the inclusion of food biodiversity and the participation of Indigenous Peoples and traditional communities in public procurement.

METHODS

This research was carried out in six municipalities in a Region of the Brazilian Amazon, focusing on the Food Acquisition Programme (PAA) and the National School Feeding Programme (PNAE). The lists (notices) of these programs' purchases, contracts and school menus were analyzed, referring to one year of execution. The foods were classified as socio-biodiversity based on MAPA/MMA Interministerial Ordinance No. 10/2021 and the Ministry of Health's official publication of Brazilian Regional Foods.

RESULTS

In the PNAE, 146 foods were demanded, of which 25.0% to 37.5% represented socio-biodiversity among the municipalities, while in the menus this socio-biodiversity ranged from 0.0% to 21.9%. Municipalities with a higher inclusion of biodiversity had more *in natura* or minimally processed foods, while a lower percentage was associated with a higher presence of ultra-processed foods. The PAA included 292 demanded foods, with socio-biodiversity ranging from 17.6% to 32.4%. According to PNAE data analyzed, only one municipality included suppliers from traditional communities, such as babassu coconut breakers. Whereas PAA data showed that Indigenous Peoples, Quilombolas and other communities participated widely, except in one municipality. The PAA was more inclusive, owing to policies specifically designed for these groups and reflected a greater food biodiversity.

CONCLUSIONS

The RESULTS indicate that policies that prioritize Indigenous Peoples and traditional communities are fundamental to expanding the use of socio-biodiversity and fostering more sustainable food systems, demonstrating the transformative potential of these programmes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_040

CURRENT STATUS OF NUTRITION-RELATED HOME ECONOMICS EDUCATION IN JAPAN

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BACKGROUND AND OBJECTIVES
In Japan, textbooks are the primary teaching material that are reviewed for compliance with study courses. In 2017, the study courses for elementary and junior high schools were revised, followed by a revision for high schools in 2018, the first in 10 years . These novel study courses emphasize that home economics should contribute to enhancing Shokuiku [meaning Food and Nutrition Education] . However, it has been noted that home economics textbooks before the revision lacked sufficient content on nutrition education compared to those in the U.S. and U.K. This study aimed to analyze home economics textbooks based on novel study courses to understand the content of nutrition education.
METHODS
First, to organize the nutritional content in the curriculum, we assessed the learning objectives and guidelines for nutrition in the novel home economics curriculum for elementary, junior high, and high schools. Subsequently, we analyzed the nutrition-related content in the textbooks corresponding to the novel curriculum guidelines by categorizing the items and number of pages. Two elementary school textbooks, three junior high school textbooks, and 16 high school textbooks were analyzed.
RESULTS
Nutrition-related content in the novel study courses was compared across school types. In the section “The Role of Meals,” elementary school students learn why we eat and its role in health and growth. In junior high school, students focus on their relationships, enhance their eating habits and nutritional balance, and learn to play a role in preserving the food culture. In high school, students learn about the role of food in various life stages. Textbooks on nutrition were classified into eight categories—role of meals, functions of nutrients, food combinations and nutritional balance, menu planning, food culture, meal preparation, cooking, and others. Across all school types, the largest portion of content was associated with cooking. While most elementary and junior high school content was focused on food, high school content emphasized the function of nutrients.
CONCLUSIONS
Nutrition-related content in home economics textbooks varied by school type regarding the number of pages, items emphasized, and their coverage order. Even textbooks compliant with the novel study courses lacked data on physiological content, such as digestion, nutrient absorption, and the formation of healthy eating habits across the lifespan, thereby limiting the role of home economics in nutrition education.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_043

COPING STRATEGIES AND EXPERIENCES OF WOMEN LEADERS FROM COMMON POTS IN PERI-URBAN AREAS OF A LOWER MIDDLE INCOME COUNTRIE (LMIC) FACING FOOD INSECURITY DURING THE COVID-19 PANDEMIC

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BACKGROUND AND OBJECTIVES
Background: At the beginning of the COVID-19 Pandemic, the population in a vulnerable situation was not able to afford their daily diet, for this reason, the resurgence of citizen support initiatives called "common pots" was observed. However, the coping strategies carried out and their experiences with food insecurity are unknown.
Objective: Understand the coping strategies and experiences of women leaders from common pots in peri-urban areas of a lower middle income countrie (LMIC) in the face of food insecurity during the COVID-19 Pandemic.
METHODS
Qualitative approach study and phenomenological design. The study subjects were 26 women leaders from common pots in peri-urban areas of a LMIC. For data analysis, triangulation of information was carried out by technique to achieve the reliability of the study.
RESULTS
The coping strategies carried out by the leaders were the collection and rescue of food in different markets, they also gave priority to the cheapest foods as well as those received in donations, in addition, the conservation methods of food depended on the equipment available to each organization. Additionally, the positive experiences they recovered were having learned to cook for a greater number of diners and work as a team with their neighbors, and, on the contrary, the negative experience was having received negative comments from merchants and some beneficiaries.
CONCLUSIONS
Coping strategies against food insecurity were similar in the six common pot organizations. On the other hand, the experiences of the members of each common pot were understood.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_044

DEVELOPMENT OF DIETARY LIFESTYLE ASSESSMENT TOOL FOR YOUNG ADULT POPULATION IN SOUTH KOREA

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BACKGROUND AND OBJECTIVES
Recent epidemiological data have identified young adults in their 20s as a health and nutrition vulnerable group in urgent need of policy intervention. Therefore, this study was designed to develop a measurement tool for systematically classifying dietary lifestyle patterns in young adults. By clustering dietary lifestyle patterns of young adults and analyzing their associations with various health risk factors, this tool aims to support dietary improvement initiatives for this age group.
METHODS
This study surveyed 800 young adults in Korea aged 20–35 (300 participants in the 1st phase, 500 in the 2nd phase, and 50 participants in the 2nd phase) through three rounds of online surveys. The tool development process involved generating preliminary items through a literature review and pilot studies on the selected young adults, followed by expert consultation. The developed tool was subjected to exploratory factor analysis and principal component analysis to identify factor structures, and confirmatory factor analysis was conducted to validate the measurement model. Internal consistency was assessed using Cronbach's alpha coefficient and average inter-item covariance, with thresholds set at ≥0.7 and 0.2–0.4, respectively. Statistical analyses were performed using Stata 17.0.
RESULTS
In the first survey, dietary lifestyle patterns were classified into 56 items across eight domains: health and hygiene, convenience, affordability, trendiness, gastronomy, emotions, ecological environment, and social relationships. Through exploratory factor analysis and principal component analysis, the tool was refined to 30 items with high internal consistency. The health and hygiene domain was narrowed to include only health-related items. In the second survey, each domain demonstrated high Cronbach's alpha values: health (4 items, α = .7699), convenience (4 items, α = .7353), affordability (4 items, α = .7537), trendiness (4 items, α = .8266), gastronomy (4 items, α = .8501), emotions (4 items, α = .8266), ecological environment (3 items, α = .8432), and social relationships (3 items, α = .7659). A follow-up survey conducted one month later with 50 participants from the second phase showed high reliability.
CONCLUSIONS
The dietary lifestyle assessment tool developed in this study (comprising 30 items across six domains) demonstrated high reliability. Further confirmatory factor analysis and correlation analysis with health-related factors will validate its effectiveness as a systematic tool for classifying and evaluating dietary lifestyle patterns among Korean young adults.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_047

SOYBEAN ISOFLAVONE INTAKE AND ESTROGEN RECEPTOR DEFINED BREAST CANCER MORTALITY SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES
Breast cancer is the most common cancer in women globally [1]. However, survival rates have improved substantially due to early detection through widespread breast cancer screening and modern medical treatments. It suggested that studies do not indicate an increased risk for breast cancer survivors who consume soy, but the current evidence is reported to be insufficient [1].We conduct a systematic review of the current epidemiological research evidence on the association between soy isoflavones intake and the risk of estrogen receptor-defined breast cancer mortality, leading to the dietary support of breast cancer survivors.
METHODS
We conducted a systematic literature search with Pubmed. Last searched date was January 10, 2023.
RESULTS
A total of 56 studies were identified. Six prospective cohort studies [2] [3] [4] [5] [6] [7] and one meta-analysis [8] were selected. In addition, we extracted two prospective cohort studies [9, 10] from one meta-analysis and finally adopted eight prospective cohort studies and one meta-analysis.
CONCLUSIONS
In overall, five of eight studies reported that high soy isoflavone intake was associated with a statistically significant reduction in breast cancer mortality. A statistically significant reduction in breast cancer mortality with higher soy isoflavone intake has been reported three of the five studies for ER+ tumors, two of four studies for ER- tumors. No studies reported a statistically significant increase in breast cancer mortality risk with higher intakes of soy isoflavones.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_048

ANEMIA AND ITS ASSOCIATED RISK FACTORS AMONG YOUNG CHILDREN, ADOLESCENT GIRLS, AND NON-PREGNANT WOMEN OF REPRODUCTIVE AGE IN LEBANON

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BACKGROUND AND OBJECTIVES

Anemia affects over 1.9 billion people globally (25% of the population), and disproportionately affects children, adolescents, and women. This study examines anemia prevalence and risk factors among children (6–59 months), adolescent girls (15–19 years), and non-pregnant women 15-49 years of age in Lebanon.

METHODS

Data from a 2023 nationally representative cross-sectional survey were analyzed. Multivariable poisson regressions were used to calculate the adjusted prevalence ratio (aPR) for anemia of variables significantly associated with anemia in bivariate analysis, separately for children (6-59 months), pre-menarched adolescent girls (10-19 years), menstruating adolescent girls (10-19 years), and non-pregnant women (15-49 years).

RESULTS

The adjusted prevalence ratio (aPR) for anemia was higher in children with iron deficiency (aPR 2.14), vitamin A deficiency (VAD; aPR 1.97), inflammation (aPR 1.49), stunting (aPR 1.7), and inadequate household sanitation (aPR 1.36). Among pre-menarche and menstruating adolescent girls, anemia was significantly associated with iron deficiency (aPR 3.07 and 3.88, respectively) and inflammation (aPR 1.61 and 1.41, respectively). Vitamin A deficiency was also associated with a higher risk of anemia in menstruating girls (aPR 1.67). In non-pregnant women, anemia was associated with iron deficiency (aPR 3.2), vitamin A deficiency (aPR 1.93), and severe menstrual bleeding (aPR 1.2).

CONCLUSIONS

Anemia control programs should aim at the prevention of the main predictors of anemia in various population groups by reducing iron and vitamin A deficiencies and addressing the main drivers of inflammation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_050

TEACHING FOOD-BASED DIETARY GUIDELINES TO ADOLESCENTS USING THE PEER LEARNING METHOD

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BACKGROUND AND OBJECTIVES
Food-Based Dietary Guidelines (FBDGs) provide evidence-based recommendations for promoting healthy eating habits. There is a need to evaluate effective methods for teaching the recently launched Ghana Food Based Dietary Guidelines to improve awareness and understanding among adolescents. Peer learning is one such strategy that fosters student participation and interaction, potentially enhancing comprehension and retention of nutritional knowledge. This study aimed to assess the effectiveness of a peer learning intervention in teaching and learning of the Ghana Food-Based Dietary Guidelines among adolescents.
METHODS
A pretest-posttest study design was used to evaluate adolescents' knowledge of the FBDGs before and after a peer learning intervention. Participants took a standardized knowledge test at baseline, after which were divided into groups for peer-led discussions and activities on selected FBDG topics with the aid of a faciitator. Post-intervention, students took the standardized test again to measure knowledge improvements. Data were analysed using SPSS version 26. A paired t-test was conducted to compare pretest and posttest knowledge scores, and a chi-square test and correlation analysis was used to assess relationship between nutritional status (Body Mass Index (BMI)) and baseline nutritional knowledge.
RESULTS
A total of 36 students aged 12 -15 years in a junior high school participated in the study with majority of participants being males (55.6%) and majority having a normal BMI (61.1%). Post-intervention assessments showed an improvement in FBDGs knowledge, with the percentage of students scoring "Excellent" rising from 58.3% to 75%, although this improvement was not statistically significant ($p = 0.121$). A moderate but statistically significant negative correlation ($r = -0.328$, $p = 0.025$) was observed between BMI and pretest scores, suggesting that higher BMI was associated with lower baseline nutritional knowledge.
CONCLUSIONS
Peer learning can be a viable approach to nutrition education, particularly in resource-limited settings where access to professional teachers may be constrained. This study supports the incorporation of FBDGs into school curricula as a means of improving dietary behaviours from an early age, which is crucial for long-term health outcomes.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_051

ASSESSING CHALLENGES TO IFA SUPPLEMENTATION ADHERENCE AND ANEMIA CONTROL AMONG SCHOOL-GOING ADOLESCENT GIRLS

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BACKGROUND AND OBJECTIVES
Anemia remains a significant public health challenge in India, disproportionately affecting women and adolescents, with 80.3% of adolescent girls in Bankura District affected (NFHS-5). Addressing their nutritional needs is essential to breaking cycles of malnutrition and related chronic conditions. This study explores adherence to the Iron Folic Acid (IFA) supplementation program (60 mg elemental iron and 500 mcg of Folic acid as per government protocols), gaps in service delivery, and dietary practices. It highlights adolescent girls as a pivotal stage in the lifecycle, emphasizing their critical role in addressing public health nutrition challenges and priorities.
METHODS
A cross-sectional design was used, employing non-probability purposive sampling. The study included 100 school-going adolescents (15–18 years) and 30 frontline health workers (FLWs) (18 ASHAs, 12 AWWs). Data collection involved a Knowledge, Attitudes, and Practices (KAP) survey, anthropometric measurements, dietary recall, and interviews. Statistical methods, including chi-square and t-tests, were applied to analyze relationships between variables.
RESULTS
Among adolescents, 56% had normal BMI-for-age, while 22% showed mild thinness. Dietary diversity was 86.66% consuming high levels of processed foods. IFA compliance was low (39%), with taste identified as a significant barrier ($p = 0.001$). Poor anemia knowledge was observed among 89% of adolescents, while 91.67% of frontline workers demonstrated average knowledge. A significant correlation ($p<.05$) indicated that FLWs' knowledge was not effectively transmitted to adolescents. However, gaps were evident, as many adolescents failed to follow WASH guidelines ($p<.05$). Key challenges included inadequate training for FLWs, weak coordination among ASHAs, AWWs, and school personnel, and insufficient anemia-related information from teachers. 78% of adolescents lacked hemoglobin checks, and 26% reported menstrual issues. School support systems were found to inadequately monitor IFA consumption and provide effective counselling.
CONCLUSIONS
Significant gaps in IFA compliance and adolescent nutrition, compounded by insufficient training and supervision of FLWs, were identified; thus, improving FLW training is crucial. Strengthening multi-sectoral collaboration and enhancing government support to advance adolescent health and anemia control efforts needs to be critically addressed.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_052

INTERVENTIONS TO REDUCE ANAEMIA IN LOW- AND MIDDLE-INCOME COUNTRIES: AN EVIDENCE GAP MAP

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BACKGROUND AND OBJECTIVES
Evidence about interventions to tackle the myriad causes of anaemia is growing. Previous evidence mapping has focused on a subset of relevant factors, interventions, or populations. The objectives of this EGM are: 1) identify and describe the characteristics of impact evaluations (IEs) and systematic reviews (SRs) which evaluate the effects of interventions to reduce anaemia or that address the determinants of anaemia in low-and-middle income countries (L&MICs); 2) summarize findings from high- and medium-confidence SRs; 3) identify primary evidence gaps and synthesis gaps
METHODS
Relevant literature was searched across 12 academic databases and eight grey literature sources to identify EIs and SRs. We used EPPI Reviewer to organize and screen the imported search RESULTS. We extracted data on various study characteristics from the included studies (year of publication, study design geography, population characteristics, interventions and outcomes). We critically appraised and rated the identified SRs with confidence ratings of low, medium, or high using an adapted version of the SURE checklist. We followed the PRISMA guideline for reporting reviews
RESULTS
2,870 reports were included (2,196 unique IEs and 195 unique SRs). Of the 195 SRs, 57 were appraised as high or medium confidence. Most IEs took place in Africa and South-East Asia. Approximately 81% of IEs focused on interventions addressing the direct causes of anaemia, with most of these focusing on nutrition, and fewer studies on other direct causes of anaemia. Far fewer IEs evaluated interventions on intermediate (6.5%) and underlying (1%) risk factors. Approximately 15% of the IEs evaluated multicomponent interventions. Of the 57 SRs, most focused on interventions to address direct causes of anaemia (n=53), such as nutrition (n=34) and chronic disease/infectious diseases (n=18). The SRs indicate the potential of several interventions to address direct causes of anaemia and in reducing anaemia. The online, interactive tool can be accessed using the following link
CONCLUSIONS
The EGM tool offers a large well-organized body of evidence that decision-makers can customize to their areas of interest and use when designing and funding anaemia policies, interventions, and program evaluations. It also highlights gaps that policymakers, funders, researchers, and other stakeholders can prioritize to further expand our collective knowledge regarding how to reduce the prevalence of anaemia globally
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_054

SELF-REGULATION FOR (UN)HEALTHY FOOD MARKETING TO CHILDREN

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BACKGROUND AND OBJECTIVES
Nutrition and health claims on labels, pictures in stores, graphics and slogans on websites and social media: voluntary food information is strongly used by food marketeers to reach specific target groups. Various initiatives are taken worldwide to ensure fair information provision, and particularly to protect vulnerable groups such as children from these intentional and non-intentional influencing strategies. Many policies focus on self-regulation, by producers. In this study, I analyse the effects of self-regulation on food marketing to children.
METHODS
Using a case study approach, I study food marketing practices targeting children in the Netherlands. Cases from self-regulatory organisations were selected to represent different marketing strategies, including information, graphics and visuals used on labels, in stores, at events and online. Next to examining the compliance of these practices with self-regulatory guidelines established by industry bodies, as well as WHO guidelines on food marketing to children and national nutrition guidelines.
RESULTS
Even though standards exist that should be adhered to, children are still highly exposed to marketing practices that stimulate unhealthy foods. Particularly online communication often does not adhere to the national advertising code. With the advertising code being less strict in categorising healthy versus unhealthy foods, also foods that do not fall within the nutritional guidelines may still use marketing targeting children
CONCLUSIONS
The RESULTS from this case study highlight that self-regulation is insufficiently effective in protecting children from unhealthy food marketing practices. In line with studies in other countries, self-regulatory measures are insufficiently aligned with nutrition & health-based policies to stimulate children to choose healthier food products. This particularly holds for new forms of advertising, such as influencer's use of social media to promote foods to children. More stringent regulatory measures, which can be effectively enforced, are needed to support children in making healthier food choices.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_055

HOW TO ACHIEVE AN INTERCULTURAL APPROACH TO IMPLEMENT THE HEALTHY EATING PERUVIAN LAW?

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BACKGROUND AND OBJECTIVES

In Peru, the Law 30021 for the "Promotion of Healthy Eating in Children and Adolescents" promotes an intercultural approach; however, Peruvian food varies depending on each region, and implementing healthy eating is a great challenge. This research abstract aims to identify the main recommendations from stakeholders to achieve an intercultural approach in the implementation of the healthy eating Peruvian law.

METHODS

A qualitative research design was employed. We developed 31 in-depth, semi-structured, one-on-one interviews among governmental (n=16) and non-governmental (n=15) stakeholders from Peru. An interview guideline was designed and tested by experts in the topic. The interviews were transcribed, coded and categorized by two researchers. This analysis focuses specifically on the intercultural approach in healthy eating promotion.

RESULTS

The interviewees from the governmental sector indicated that the implementation at the local and regional level of the "Dietary guidelines for the Peruvian population" is key for promoting and achieving healthy eating with an intercultural approach. Nutritional educational strategies regarding healthy eating must be designed, developed and tailored according to the Peruvian natural regions: coast, highlands and jungle. Enhancing the consumption of the affordable, available and nutritious local foods, as well, cultural awareness of eating patterns of the Peruvian population from the different regions was considered relevant. Training health professionals, schoolteachers, and community leaders is recommended to identify the local food resources and to promote healthy eating customized to the local and regional context. From the non-governmental sector suggested that the nutritional education should consider the inclusion of the Peruvian native languages. The nutrition professionals should master the intercultural competencies to participate in the implementation of healthy eating policies. Training people from the communities and involving them in the design of healthy eating programs and policies was evaluated as very important. Finally, leveraging the leadership and strengthening the decentralization of the regional and local governments, likewise, political decision, surveillance and monitoring on the local, regional and national level were recommended.

CONCLUSIONS

To achieve a successful intercultural approach in the implementation of the healthy eating Peruvian law is essential to addressing intercultural aspects, involving professionals and community leaders, tailoring the nutritional education, and decentralizing governments.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_056

CURRENT STATUS OF SUPPLEMENT USE FOR JAPAN JUNIOR HIGH SCHOOL ATHLETES

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BACKGROUND AND OBJECTIVES
In recent years, the use of supplements and functional foods in children has increased in Japan, and there are concerns about the nutritional status of users. Therefore, we summarized how the nutrient intake status of supplement users compared to non-users in children who play sports in which supplement users are observed, and decided to use it as a reference for future nutrition education.
METHODS
In April 2024, a questionnaire survey and a nutrition survey using Self-administered diet history questionnaire (DHQ) were conducted on 37 junior high school soccer players who had not received nutrition education so far. The participants were divided into two groups: 20 people who took supplements (tablets) and 17 people who did not take supplements, and compared the nutrient sufficiency rates from foods other than supplements. We used the dietary reference intakes for Japan and the standards of the Japan Sports Association. Significance probabilities of less than 5% were considered significant.
RESULTS
The group taking supplements had a higher carbohydrate sufficiency rate than the non-supplement group, but the non-supplement group had higher sufficiency rate for other energy and nutrients.Significant differences were found between the two groups in protein, lipids, vitamin A, vitamin B_1 ($p<0.05$), and carbohydrates ($p<0.01$). The current RESULTS differ from previous findings, which showed that the group taking supplements had a better regular diet than non- supplement group. It was speculated that anxiety about daily nutrient intake may trigger the habit of taking supplements that can be easily ingested.
CONCLUSIONS
Although supplements are useful for dealing with consumption during exercise, it is necessary to communicate the benefits of taking nutrients from food so as not to rely too much on nutritional intake from supplements.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_058

ASSESSING THE RELIABILITY OF A NATIONAL FOOD FREQUENCY QUESTIONNAIRE: INSIGHTS BY SEX AND AGE GROUP

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BACKGROUND AND OBJECTIVES
Accurately assessing dietary intake at a population level is crucial for understanding the relationships between diet and prevalent diseases and informing public health recommendations. In Uruguay, it was necessary to develop a national food survey method to achieve this. Before its widespread use, the reliability and validity of a food frequency questionnaire (FFQ) must be studied, as reliability can vary between different age and sex groups. This study aimed to evaluate the reliability of a new national FFQ according to sex and age group.
METHODS
A national convenience sample of 323 adult participants (60.1% women) who completed an online FFQ twice, 15 days apart, for reliability analysis was included. Qualified trained personnel helped administration. The normal distribution of calories and nutrients obtained from the 63-item FFQ was assessed using Kolmogorov-Smirnov tests. Energy-adjusted Pearson or Spearman correlations between nutrients were assessed to measure reliability according to sex and age group (young adults < 65 years; older adults ≥ 65 years). A $p < 0.05$ was considered significant.
RESULTS
Overall, the FFQ showed good reliability. Depending on the nutrient, reliability correlation coefficients after adjusting for energy ranged from 0.55 to 0.73 in women, from 0.41 to 0.72 in men, from 0.48 to 0.75 in young adults, and 0.45 to 0.70 in older adults. Reliability coefficients for calories were lower for men (r=0.42) and older adults (r=0.50) compared to women (r=0.57) and adults (r=0.54). Higher energy-adjusted correlation coefficients were observed for women compared to men. In women, good reliability coefficients were obtained for saturated fatty acids (r=0.70), vitamin A (r=0.71), D (r=0.73), and calcium (r=0.71); in men, vitamin D (r=0.72). In young adults, vitamin A (r=0.72) and D (r=0.75) showed very good reliability, while in older adults, the latter occurred for vitamin D and calcium (r=0.70 each).
CONCLUSIONS
The new FFQ achieved good reliability for assessing habitual dietary intake in both sexes and the adult age group.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_060

NUTRITIONAL INTAKE AND EATING HABITS IN CHILDREN WITH AUTISM AND THE RISK OF CARIES DEVELOPMENT

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BACKGROUND AND OBJECTIVES
Children with autism have specific eating patterns - dietary restrictions, but also high consumption of foods with high sugar concentrations, affecting their oral health. The aim of the study was to assess the relationship between eating habits and carbohydrate intake in children with autism and the development of dental caries.
METHODS
Thirty children with autism aged 5 to 12 years were studied. A 7-day food diary was used to assess nutrition and eating habits, which is the most reliable tool for assessing actual dietary intake in these children.
RESULTS
The data show that half of the children are at high risk of developing dental caries, as they report frequent intake of carbohydrate foods. ⅓ Children have a low caries risk and limited carbohydrate intake, and the remaining 17% of children have a medium risk of developing dental caries and eating carbohydrate foods rarely between meals. The RESULTS show that in their daily diet there are many risky foods such as junk foods. High values of the D1MFT index above 4 have been reported.
CONCLUSIONS
Unhealthy eating habits have been identified as an important risk factor for the oral health of children with autism and should be limited in between meals and the consumption of beverages and highly processed foods high in sugar, fat and salt, at the expense of snacks with high biological density.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_062

THE INFLUENCE OF DIETARY INTAKE ON THE HEALTH STATUS OF CHRONICALLY ILL PATIENTS: A CASE STUDY OF HYPERTENSIVES AND DIABETICS PATIENTS ATTENDING HEALTH CARE

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BACKGROUND AND OBJECTIVES
Chronic diseases such as hypertension and diabetes is on the rise as a result of industrialization, increased life expectancy, and poor lifestyles. This has resulted in higher health expenditures, a rise in morbidities, and a higher death rate. Diet is a significant factor in the development and prognosis of these diseases. Notable gap exists in comprehending the specific influence of dietary intake on the health of chronically ill patients. This study sought to explore the dietary habits of patients with hypertension and diabetes and its effects on their health at Cape Coast Teaching Hospital (CCTH) in the central region of Ghana
METHODS
The study employed a cross-sectional design spanning 1 month, purposively sampling 300 respondents from clients visiting the hospital. Primary data about sociodemographic profiles, dietary behaviours of patients, and health outcomes were collected and subsequently analyzed using descriptive and inferential statistics.
RESULTS
The average age of respondents is 59 years, SD 11.9. About 85.7% had primary to high school education, 43% were married, and 30% were not employed. Only 37% are on special recommended diets. less than half (45%) regularly eat fruits, and only 47% eat at a set time each day. About 43% eat late at night and oily foods are consumed by 40.3% of the respondents. Energy drinks or alcohol is consumed by 48.3% of the respondents. About 94% of respondents regularly eat home-cooked foods. The respondents' food choices are mostly influenced by their appetite and about 58.3 are aware of foods that influence their health status. A significant association was found between following a dietary plan and recent episodes of high blood sugar in the immediate past month ($X=21.4$ $p<0.001$) as well as the frequency of episodes of high blood sugar ($X=43.1$, $p<0.001$). Following a specific dietary plan was also significantly associated with heart attack, stroke, and retinopathy episodes respectively. Eating fruits or vegetables regularly was significantly associated with blood sugar values, stroke, and retinopathy episodes. Eating at set times is significantly associated with recent episodes of high blood pressure, blood sugar value, and stroke respectively. Late-night eating is associated with recent episodes of high blood sugar and frequency of episodes in a month as well as emergency room visits. Eating oily foods was associated with recent episodes of high blood sugar and frequency of episodes in a month.
CONCLUSIONS
In chronically ill patients dietary habits and lifestyle does have influence on their health outcomes.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_063

ADHERENCE STRATEGIES ADOPTED BY COMMUNITY WOMEN FOR BALANCED-ENERGY PROTEIN SUPPLEMENTATION DURING PREGNANCY IN RURAL BANGLADESH

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BACKGROUND AND OBJECTIVES
The World Health Organization recommends Balanced Energy Protein (BEP) supplements for pregnant women in undernourished populations as an intervention to reduce the risk of adverse birth outcomes yet few programs exist implementing BEP. Adherence has been problematic with other nutrition interventions in pregnancy. As part of a cluster-randomized trial in rural Bangladesh, fortified BEP supplements were delivered to women's homes, and for daily consumption and provided guidance by community health research workers (CHRWs) hired for the project. This included a leaflet with instructions, a calendar, tupperware to keep the supplements within eyesight, routine monthly visits to replenish supplies, and mid-monthly phone calls to promote adherence. In addition, they were counseled on other strategies such as being self-aware and asking family members to remind them. We sought to understand women's perspectives on their own adherence to supplementation and the support they received for this during the trial.
METHODS
Thirty-two in-depth interviews were conducted with women who had received BEP supplements during pregnancy during the trial. RESULTS are based on preliminary coding of interviews that will be fully coded for the presentation. In addition, each woman was asked to rank 9 pictorial cards depicting various strategies to remind them to take the BEP product daily and to explain the reason for their ranking.
RESULTS
Adherence to BEP supplementation in the trial was high (>85%). Women employed various strategies to remember to eat the BEP product. About half of the women said they remembered to take the supplements on their own volition (47%), reflecting a high level of motivation among participants. Nearly a third of the women (31%) felt that reminders from family members had been helpful. Keeping the product stored within eyesight (19%) was also helpful.
CONCLUSIONS
Adherence to BEP supplementation was influenced by self-motivation, support from family members and storing the supplement within eyesight in addition to home-based and regular delivery and guidance and support provided by community health workers in this rural context in Bangladesh. These findings have programmatic implications. Funding: Bill and Melinda Gates Foundation (grant number INV-033381)
CONFLICTS OF INTERESTS
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EPO5_064

WARNING OR WELCOME? CONSUMER ENGAGEMENT WITH PROPOSED DESIGNS OF GHANA´S FRONT-OF-PACKAGE NUTRITION LABELS AND THEIR IMPLICATIONS FOR HEALTHFUL FOOD CHOICES

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BACKGROUND AND OBJECTIVES
Front-of-package (FOP) nutrition labels are designed to provide consumers with easily accessible and understandable nutritional information at the point of purchase, potentially guiding healthier food choices. Different formats of FOP nutrition labels are used worldwide. This study investigates preferences for proposed designs of Ghana´s FOP nutrition labels as well as their salience (participants' perceptions of noticeability, readability, and believability) and their influence on food product choices.
METHODS
A cross-sectional survey of 2468 Ghanaian consumers. Participants were recruited nationally across demographic, gender, urban, and rural residency. Data were collected on how often participants interact with food labels and their familiarity with nutrition information panels. To assess preferences and perceptions of FOP label designs, participants were shown images of different label types - octagonal, triangular, and rectangular - in three colors: black, red, white, and a combination of these. A positive logo was also included to represent healthier food choices.
RESULTS
About half of the 2,468 respondents were females. Food label awareness, literacy, and usage were low: 16% of the respondents did not know how to read food labels. Among those who could, 13.4% never read them, and 25.7% reported reading food labels sometimes. About three-quarters (73.6%) of the respondents had never seen FOP warning labels on food packages. Despite this, 83.4% believed that FOP warning labels would be "very helpful" in identifying whether a food is healthy or unhealthy. There was overwhelming support for mandatory warning labels on foods high in sugar, salt, or fat, with 93% agreeing. Respondents favored designs with bold text and striking colors, such as red and black, regardless of the nutrient or substance of interest salt, sugar, fat, or non-sugar sweeteners) or label shape (octagonal, triangular, or rectangular). Labels that incorporated visual symbols (e.g., sugar cubes, spoons) and used cautionary colors like red to signify danger were preferred. Logos featuring FDA Ghana inspired greater trust.
CONCLUSIONS
Ghanaian consumers strongly support the use of warning labels for foods high in sugar, salt, and fat, with a preference for designs that combine bold visuals, cautionary colors, and culturally resonant elements. Positive logos promoting health and family also resonated well.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_067

DIET-WIDE ASSOCIATION STUDY OF FOODS, NUTRIENTS AND HIP FRACTURE RISK: A PROSPECTIVE COHORT STUDY OF 21,369 INCIDENT CASES AMONG 542,068 POSTMENOPAUSAL WOMEN

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BACKGROUND AND OBJECTIVES
Previous research on diet and hip fracture risk has mainly focused on selected foods and nutrients. We investigated the associations between dietary factors and hip fracture risk using a diet-wide association study.
METHODS
The study population comprised 542,068 postmenopausal women in the Million Women Study. Dietary information was assessed using a validated short food frequency questionnaire in 2000-2004, and calibrated with one 24-hour dietary recall collected on a sub-sample 10 years later. Cox regression was used to estimate hazard ratios (HR) and 95% confidence intervals (CI) for associations between 99 dietary factors and risk of incident hip fractures, ascertained through electronic linkage to national hospital records.
RESULTS
After an average of 18.3 years of follow-up, 21,369 incident hip fractures occurred. In multivariable-adjusted models, 55 of the 99 dietary factors were significantly associated with hip fracture risk after correction for multiple testing (False Discovery Rate <0.05). The five foods most strongly associated with hip fracture risk (based on p value) were chicken (HR, 95% CI = 0.83, 0.79-0.87 per 20 g/day), vegetables (0.87, 0.84-0.90 per 100 g/day), fruits (0.87, 0.82-0.91 per 200 g/day), chips (1.13, 1.09-1.18 per 25 g/day), and fizzy drinks (1.18, 1.11-1.24 per 50 g/day). The five nutrients most strongly associated with hip fracture risk were protein (0.80, 0.75-0.85 per 15 g/day), zinc (0.82, 0.77-0.87 per 2 mg/day), carotene (0.91, 0.88-0.94 per 1000 µg/day), fibre (0.88, 0.85-0.92 per 5 g/day), and alcohol (0.91, 0.87-0.94 per 20 g/day). Neither milk nor total dietary calcium was associated with risk. The RESULTS were consistent in stratified analyses by body mass index, smoking, alcohol consumption, baseline health status, and physical activity, as well as in sensitivity analyses excluding the first five years of follow-up.
CONCLUSIONS
Many dietary factors were associated with hip fracture risk: several “healthy” foods were associated with lower risk, while some “unhealthy” items were associated with higher risk. Further research is needed to assess whether these associations might reflect causal relationships.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_069

CALORIC RESTRICTION AND WEIGHT LOSS IN LACTATING WOMEN: EVIDENCE FROM A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES
Lactating women face the challenge of adopting a diet that supports adequate breast milk production, ensuring optimal infant development, while also contributing to maternal health and the recovery of pre-pregnancy weight. Evidence suggests that caloric restriction may be an effective strategy for weight management in the general population; however, its effects on the health of lactating women remain incompletely understood. Objective: To evaluate the effects of caloric restriction diets on weight loss in lactating women
METHODS
The PUBMED, Web of Science, Scopus and Bireme/LILACs databases were searched for relevant articles until September 2024. All published controlled trials, on caloric restriction during lactation were considered. Data extraction covered study details, outcomes and limitations. The JADAD scale was employed to assess methodological quality.
RESULTS
The analysis included three studies involving 105 participants (Table 1). No self-reported changes in breastfeeding practices were observed among the lactating women in these studies.
Table 1. General characteristics of the documents included in the review. I,Intervention Group; C, Control Group.

Author (Year)	Controlled trial	Participants (N)	Caloric Restriction	Intervention Duration	% Weight Loss	JADAD scale
Strode (1986	non-randomized	I:22, C:8	20% a 30%	1 week	-0.07%	0 (low)
McCrory (1999)	randomized	I:22, C:23	35% + Vitamins and Minerals	11 days	-2.78%	3 (high)
Bertz (2012)	randomized	I:15, C:15	500 Kcal/day	12 weeks	-11.94%	3 (high)

CONCLUSIONS
The availability of randomised clinical trials in the scientific literature remains limited. A 12-week intervention with caloric restriction (500 kcal/day) proved more effective for weight loss in lactating women without any self-reported detriment to breastfeeding. Further research is necessary to evaluate the effects of this dietary intervention on breast milk composition and infant health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_070

INTERVENTIONS TO PROMOTE HEALTHIER FOOD RETAIL ENVIRONMENTS: CHARACTERISTICS, BARRIERS AND FACILITATORS

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BACKGROUND AND OBJECTIVES

The retail environment influences food choices, whether through the nudging and marketing of unhealthy foods or the absence of healthy foods. It can influence eating practices, health and nutritional status of individuals and populations. Therefore, interventions in the food retail are being carried out around the world, but little is known about their design, target audience and what are the barriers and facilitators. This study aimed to map interventions to promote healthier food retail environments, characterize and identify the respective barriers and facilitators.

METHODS

A scoping review was conducted to answer the question: How are the interventions to promote healthier food retail environments designed, and which are their barriers and facilitators of interventions?" The search was conducted using descriptors and operators "(environment) AND (food retail) OR (consumer food environment) AND intervention" in five international and regional databases. Review studies, those not derived from scientific studies and that did not address interventions in food retail, were excluded.Data extraction was performed in Google spreadsheets, and barriers and facilitators were entered into an Implementation Science framework.

RESULTS

A total of 1,048 articles were found, but after the screening and eligibility confirmation phase, only 25 articles were included. More than half of the interventions were developed in the United States of America (USA) (n=17), in urban areas (n=15) and in small retail businesses (n=19), such as corner stores, neighborhood stores, convenience stores and supermarkets. Regarding the scope, 17 interventions were independent actions and 8 were supported by policies, programs and ordinances. Most of the interventions (n=21) targeted specific populations such as: populations with low socioeconomic conditions, indigenous people, Afro-descendants or Hispanics. The most frequent barriers were: financial constraints; lack of technical support; influence of business relationships, high employee turnover; and lack of materials.The most frequent facilitators were: partnership with stakeholders and the local community and financial incentives for participating retailers.

CONCLUSIONS

Food retail interventions are being developed primarily in the USA, in small stores, with some actions being independent and others supported by local programs, policies, and ordinances. The most frequent barriers refer to the external and internal context of food retail, and the facilitators refer to the external context.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_071

VALIDATION OF A FOOD FREQUENCY QUESTIONNAIRE USING 24-HOUR DIETARY RECALLS IN WOMEN AND MEN

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BACKGROUND AND OBJECTIVES
Non-communicable diseases (NCDs) related to inadequate diets are a major public health concern, affecting the global population. Approximately 70% of adults worldwide face serious health risks associated with overweight or obesity, hypertension, and diet-related complications. Evaluating dietary intake and its relationship with NCDs is crucial for establishing evidence-based nutritional guidelines to improve population health. Food Frequency Questionnaires (FFQs) are widely used tools to measure habitual dietary intake by estimating average food consumption over extended periods. During 2022 and 2023, a 63-item FFQ was developed to assess dietary intake among adults. This study aimed to evaluate the validity of the new FFQ compared to three 24-hour dietary recalls (R24h) in adult men and women.
METHODS
A convenience sample of 328 adults (60% women) completed the online FFQ and three R24h, including two weekday recalls and one weekend recall, within a three-week period. Nutrient and energy data from the FFQ were analyzed for normal distribution using Kolmogorov-Smirnov tests. To assess validity, energy-adjusted Pearson or Spearman correlation coefficients between nutrient intakes from the FFQ and R24h were calculated by sex. Statistical significance was set at $p < 0.05$.
RESULTS
The FFQ demonstrated fair validity overall. In women, energy-adjusted correlation coefficients ranged from 0.18 (calcium) to 0.49 (Vit. D), with poor correlations (<0.3) observed for protein, fat, MUFA, PUFA, Vit. E, iron, and potassium. Fair correlations (0.3 to 0.49) were found for fiber, carbohydrates, fatty acids, Vit. A, Vit. D, Vit. B12, and calcium. Among men, correlation coefficients ranged from 0.23 (protein) to 0.51 (calcium). Calcium showed good validity (0.51), while fair correlations were observed for protein, carbohydrates, fiber, Vit. B12, iron, and potassium.
CONCLUSIONS
The newly developed FFQ demonstrated fair validity when compared to R24h, with performance varying across nutrients and sexes. These findings suggest that the FFQ is a useful tool for assessing habitual dietary intake in adults, although further refinement may enhance its accuracy for certain nutrients.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_073

PARTICIPATORY FORMATIVE RESEARCH TO IMPROVE COMPLEMENTARY FEEDING PRACTICES IN OAXACA, MEXICO

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BACKGROUND AND OBJECTIVES

In Mexico, malnutrition remains a public health problem despite improvements in child stunting in recent years. Sub-optimal complementary feeding (CF) practices are prevalent, but more research is needed to understand the related contextual factors and underlying barriers and facilitators to optimal CF practices, in order to design effective interventions. The objective was to understand CF practices and identify the main factors serving as barriers and facilitators to optimal CF practices at the individual (mother/caregiver), family, community, and health facility levels, in Oaxaca State.

METHODS

Communities were purposively selected to comprise a mix of urban/rural and indigenous/non-indigenous settings in the regions of Central Oaxaca, Tehuantepec, and Pinotepa. Qualitative methods included in-depth interviews, focus group discussions, photodiaries, and household observations. Participants were mothers/caregivers of children 6-23 months of age, fathers, grandmothers, community leaders, and health workers.

RESULTS

There were 104 participants. Most mothers/caregivers had little knowledge of optimal CF practices (as per World Health Organization guidelines). Although most children received an appropriate number of meals/snacks per day for their age, the quality of their diet was lacking, reflected in poor dietary diversity and inappropriate consistency/quantity of foods. Few children ages 6-11 months were fed animal-source foods, such as eggs or meat, or other protein sources like beans, due to fears of choking, misconceptions, and cultural norms. Many children were fed liquid broths due to cultural norms and the misperception that broths were sufficiently nutrient-dense. Feeding of unhealthy foods and beverages was not a common practice. Health workers had little knowledge of nutrition, and counseling on CF was not integrated in any routine child health services.

CONCLUSIONS

Dietary diversity, in particular increasing feeding of animal-source foods, and increasing the quantity/consistency of foods in the period from 6-11 months of age were identified as priority behaviors for interventions. The findings will be used in a participatory human-centered design process to develop and test interventions to improve CF practices and strengthen the capacity of health workers to provide quality counseling on CF.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_075

AVAILING HEALTH SERVICES- A STUDY ON SOCIAL BARRIERS AND PERCEPTIONS AMONG WOMEN OF REPRODUCTIVE AGE GROUP

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BACKGROUND AND OBJECTIVES
Anemia remains a critical health issue among pregnant and lactating women in low- and middle-income countries, significantly contributing to morbidity and mortality. In India, persistent challenges in adherence to anemia control programs and the adoption of healthy nutritional habits exacerbate this issue. This study investigates the behavioral and societal factors influencing health service utilization and nutrition practices among women of reproductive age. By exploring community perceptions, behavioural barriers, and gender stereotypes, the study highlights the critical need for a multi-faceted approach to address anemia and promote healthier nutritional outcomes at the grassroots level.
METHODS
The observational study was conducted in four Gram Panchayats of one of the blocks on the eastern side of India. Focus group discussions (FGDs) were used to explore community perceptions, behavioral barriers, and the role of gender stereotypes in shaping health and nutritional outcomes among pregnant women, lactating mothers, and their respective mothers-in-law.
RESULTS
FGDs revealed multiple barriers to anemia control program adherence. Key issues included poor consumption of iron and folic acid-rich foods, dislike for Iron and Folic Acid (IFA) tablets, forgetfulness, and inadequate awareness of anemia. Service-related gaps, such as insufficient counselling, inadequate supply of IFA tablets, and infrastructural challenges, compounded the problem. Gender disparities emerged as a significant factor, with unequal distribution of household labor, restricted access to education, and entrenched stereotypes limiting women's ability to prioritize their health and nutrition.The findings also highlighted that many women lacked knowledge about the importance of anemia prevention and WASH practices. Limited community engagement and weak intersectoral collaboration further hindered program implementation, leaving vulnerable populations underserved.
CONCLUSIONS
Addressing anemia among women requires a multi-faceted approach involving nutrition-sensitive and specific interventions. Strategies must focus on enhancing nutrition education, improving healthcare access, and promoting gender equality to combat barriers at the grassroots level. Strengthening multi-sectoral coordination and ensuring adequate resource allocation are critical to improving outcomes in ongoing anemia control programs.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_079

METHODOLOGY FOR THE VALIDATION OF FOOD PHOTOGRAPHIC ATLASES: A REVIEW

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BACKGROUND AND OBJECTIVES
Food consumption is a determinant of the nutritional status of populations and, consequently, their health status. Food photographic atlases are visual reference tools for measuring food consumption. They represent different foods which are typically consumed by a specific population in a country or region, and therefore, they must be designed and validated with these populations to provide reliable measurements.
The aim of this study was to explore the different methods used for the validation of food photographic atlases.
METHODS
A review was conducted on the original literature regarding the validation processes of food photographic atlases published between 2013 and 2023 in three main online databases (Pubmed, Ebscohost, and Scielo). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was used for the presentation of RESULTS.
RESULTS
Of the 15 articles included, 9 conducted perception studies, 3 conducted memory studies, and 3 combined both methodologies. All used convenience samples, and only 4 studies involved the consumption of the foods being assessed.
The number of series evaluated per study ranged from 7 to 95, and the series evaluated per participant ranged from 6 to 23.
For statistical analysis, the three main methods used were the average percentage error, followed by the mean difference and the average difference between the estimations and the images. The most commonly used tests for assessing differences were Wilcoxon and t-tests, while Spearman correlation and Cohen's Kappa were used to assess correlation.
CONCLUSIONS
Methodological differences remain substantial, and the main limitations observed were the use of convenience samples and the lack of food consumption during the evaluation. Combining perception and memory methodologies is recommended for greater methodological robustness.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_081

A SYSTEMATIC SCOPING REVIEW OF FOOD ENVIRONMENTS IN URBAN BANGLADESH

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BACKGROUND AND OBJECTIVES
Bangladesh, like many low-and middle-income countries (LMICs), has experienced rapid rural to urban migration, with 41% of the population now living in urban areas. Urbanization has affected urban food environments (FE) and the dietary patterns of urban and peri-urban (UPU) populations. While Bangladesh has seen declines in child stunting under five in both urban and rural areas in the past decade, overnutrition is a growing problem. The rise in overweight and obesity is influenced by urban diets, which are insufficiently diverse and increasingly dominated by unhealthy, ultra-processed foods (UPFs). We conducted a scoping review to assess the state of the evidence on the contributions of UPU FE to the growing challenge of the double burden of malnutrition in Bangladesh, including a review of the relationship between FEs and nutrition outcomes and evaluations of FE interventions.
METHODS
A comprehensive search of peer-reviewed journal articles was conducted in Scopus covering multiple FE domains and targeting the five most populated UPU areas in Bangladesh. Two independent reviewers screened titles and abstracts. We describe and summarize the FE evidence from January 2001 – April 2023.
RESULTS
We screened 275 articles and included 32 articles in the review. Vendor/product properties and desirability were the most widely studied FE dimensions. Multiple studies found vendors failed to meet food hygiene standards. Availability, accessibility, desirability, vendor and product properties, food prices, affordability, and convenience influenced consumption or food purchase in urban Bangladesh. Fast food consumption was driven by convenience, affordability, and accessibility. A wide range of indicators were used to measure FEs; there were no standardized indicators measuring FE dimensions. No evaluations of urban FE interventions were identified.
CONCLUSIONS
This review highlights concerns of food safety, convenience and accessibility of fast food, vulnerabilities of migrant workers and dwellers of informal urban settlements, and targeted UPF marketing towards children and youth in urban Bangladesh. There is a lack of evidence on innovative and effective interventions to promote healthier UPU FE, which are urgently needed to increase the availability and affordability of nutritious foods and to curb unhealthy diets contributing to urban-rural disparities in overnutrition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_082

VARIABLES ASSOCIATED WITH DIET QUALITY AMONG MANUFACTURING WORKERS: A SURVEY FROM NORTHEAST BRAZIL

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BACKGROUND AND OBJECTIVES
Diet quality refers to the overall pattern of individuals' food choices over time, with various determinants influencing these choices. The aim of the present study was to identify the factors that affect diet quality among industrial workers in Rio Grande do Norte, Brazil, focusing on differences between men and women.
METHODS
Demographic, socioeconomic, and anthropometric factors, along with food consumption and motivations for food choices, were analyzed. The NOVA classification was used to categorize food groups, and the Diet Quality Index-International (DQI-I) was applied to determine diet quality scores. The sample included 921 workers from industries of varying sizes and sectors.
RESULTS
The RESULTS indicated that diet quality was positively associated with higher consumption of unprocessed or minimally processed foods (p=<0.001) and lower consumption of ultra-processed foods (p=<0.001), with no significant differences between sexes. Additionally, men with lower incomes showed better diet quality scores (p=0.03), possibly due to a higher consumption of traditional foods. Among women, particularly older women (p=0.010) and those more concerned with weight control (p=0.005), better diet quality was observed, reflected in higher consumption of fruits, vegetables, and fibers. Motivations related to the natural content of foods positively influenced both sexes (p=0.013; p=0.025). However, no significant associations were found between DQI-I scores and anthropometric parameters, such as BMI and waist circumference.
CONCLUSIONS
These findings conclude that cultural and socioeconomic factors play important roles in defining diet quality in working populations, directly impacting adherence to healthy eating practices and, consequently, better food choices. The study's analysis underscores the importance of interventions focused on nutritional education to enable better access to higher-quality foods for these populations.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_084

ASSOCIATION BETWEEN DIETARY PATTERNS, GLOMERULAR FILTRATION RATE AND PROTEINURIA IN PATIENTS WITH CHRONIC KIDNEY DISEASE, CHILEAN NATIONAL HEALTH SURVEY

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BACKGROUND AND OBJECTIVES
Chronic kidney disease (CKD) is a public health problem in the world, affecting 10% of the world population (1,2). In Chile, CKD reaches 3.2% of the adult population (>18 years of age), while the prevalence in those >40 years of age reaches 15.4% and a prevalence of 12.1% is reported in the primary health care (3,4). There are dietary patterns that have been shown to protect renal and cardiovascular function, including the Mediterranean, DASH (dietary approaches to stop hypertension) and vegetarian diets (5,6). The aim of this study is to associate the RESULTS of food consumption presented in the national health survey 2026-2017 with the reduction of GFR and proteinuria as markers of damage and progression of CKD.
METHODS
Secondary analysis study carried out using the National Health Survey 2016-2017 database. This survey includes individuals aged 18 and older, both Chilean and foreign, who habitually reside in occupied private households, located in urban areas across the 16 regions of Chile. Variables included were feeding healthy and unhealthy patterns, renal outcomes: glomerular filtration rate (eGFR) proteinuria (ACR), clinical, sociodemographic and nutritional parameters. For the association between renal outcomes and consumption of healthy and unhealthy patterns, Chi-square test (chi²) was used. To analyze the effect of the variables and renal outcomes, the logistic regression model was used and adjusted for: food, age, sex, geographic area, and years of study, physical activity, nutritional status, sleep and smoking.
RESULTS
A total of 5261 subjects are included. 63,9% women. Mean age 50 ± 18.3 years. Significant association was found between GFR and intake of alcohol ($p<0.001$), sugary drinks ($p<0.001$); and RAC with intake of alcohol ($p<0.001$) and sugary drinks ($p<0.001$). Logistic regression model shows significant associations with GFR and fish consumption (OR: 0. 64 (0.43-0.95)), years of education (OR: 0.63 (0.53-0.76)), physical activity (OR: 0.75 (0.58-0.98)) and ACR with consumption of sugar-sweetened beverages (OR: 1.27 (1.01- 1.59)), alcohol (OR: 1.27 (1.01- 1.61)), years of study (OR: 0.55 (0.38- 0.78).
CONCLUSIONS
The main result of the present investigation is that for eGFR, fish consumption is a protective factor and in the case of ACR, sugar-sweetened beverages and alcohol consumption are risk factors. Early detection and timely care by dietitian-nutritionists at the primary care level is essential to correctly guide patients and prevent the progression of CKD.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_085

NUTRITIONAL STATUS AND DIETARY INTAKE OF LOW-INCOME POPULATIONS ASSISTED BY PUBLIC SOCIAL SERVICES IN NORTHEASTERN BRAZIL

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BACKGROUND AND OBJECTIVES

Food and nutrition are critical issues for public health, both locally and globally. From this perspective, income transfer programs represent a social protection mechanism for economically vulnerable populations, breaking the intergenerational cycle of poverty among beneficiary families and promoting the realization of the Human Right to Adequate Food (HRAF) and Food and Nutrition Security (FNS).1,2. The present study aimed to determine the nutritional status and evaluate the dietary intake of a low-income population assisted by public social service facilities in northeastern Brazil.

METHODS

To achieve this, a descriptive, cross-sectional, and prospective study was conducted. Anthropometric nutritional status was assessed using Body Mass Index (BMI), and dietary intake evaluation was performed through a 24-hour dietary recall. The RESULTS were analyzed based on the macronutrient and micronutrient recommendations outlined in the Dietary Reference Intakes (DRIs).

RESULTS

Partial RESULTS of the study included 54 individuals, with a higher prevalence of women (89%), with a mean age of 48 ± 12.44 years, 63% of whom are beneficiaries of the Bolsa Família Program. A prevalence of 70.4% of overweight was identified, according to BMI classification. Regarding dietary intake, the average calorie consumption was 1089 kcal/day, which was lower than the estimated Total Energy Expenditure of 1716.39 ± 249.85 kcal/day. Macronutrient distribution fell within the acceptable ranges of the AMDR, while probable inadequacies were observed in the intake of calcium (98.1%), vitamin D (98.1%), magnesium (88.9%), vitamin A (88.9%), zinc (83.3%), vitamin C (79.6%), vitamin B12 (77.8%), iron (57.4%), and dietary fiber (63%).

CONCLUSIONS

The findings highlight the need for further studies addressing qualitative aspects of the diet and periodic monitoring of nutritional indicators in this population, aiming to guide healthier and more adequate dietary practices.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_087

SOCIAL INEQUALITIES, NUTRITIONAL STATUS AND BEHAVIOURAL DIFFICULTIES IN CHILDHOOD ACROSS COHORT STUDIES: A STUDY PROTOCOL

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BACKGROUND AND OBJECTIVES
There is evidence linking nutritional status to child behaviour and overall well-being (Martoccio et al., 2020, Beynon, 2023), yet little is known about how this relationship is influenced by contexts of socioeconomic disadvantage. This study investigates and compares the association between social inequalities, nutritional status, and behaviour problems in childhood across different settings.
METHODS
A literature review identified cohorts that administered the parent version of the Strengths and Difficulties Questionnaire (SDQ-P) (sdqinfo.org) to assess child behaviour problems, alongside socioeconomic and demographic data. Eight cohorts from Brazil, Ghana, Portugal, Norway, Ireland, and Australia were invited to participate, and data were requested from principal investigators or responsible agencies. After data acquisition, variables will be harmonised to ensure comparability. Household wealth will be assessed using richness indexes based on assets and income variables, categorised into cohort-specific quintiles. Anthropometric data will be standardised into sex- and age-specific z-scores according to the World Health Organization growth parameters(WHO, 2007;de Onis et al, 2007). Analyses will follow a two-stage individual participant data meta-analysis framework(Tierney et al., 2024).
RESULTS
The final sample included 20,210 children: 5,077 from three Brazilian regions; 420 from Amadora, Portugal; 930 from Trondheim, Norway; 959 from Ghana; 3,828 from Australia; and 8,996 from Ireland. The children's ages ranged from 3.4 to 9.4 years (mean 5.4 ± 0.9 years) at behaviour assessment, with 49.1% being girls. Regarding nutritional status, 2.7% were classified as thin, 11.7% as overweight, and 7.5% as obese. Most children had received any breastmilk (80.3%), 39.7% were firstborn, and 8.5% were premature. Additionally, 6.9% of mothers were teenagers (<19 years old) at the child's birth, 12.8% were immigrants, and 15.9% had not completed lower secondary education at baseline. Overall, 9.2% of children were classified as having behaviour problems based on the total difficulties scale, though prevalence varied widely, from 2.8% in Norway to 47.8% in Brazil's Northeast. Final pooled analyses will quantify these associations and explore contextual effects.
CONCLUSIONS
This project sheds light on the role of nutritional status and socioeconomic disparities in shaping childhood mental health. The findings aim to inform public health policies and interventions to mitigate the impact of social inequalities on child well-being.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_089

TEMPORAL TREND OF FOOD ACQUISITION LOCATIONS IN BRAZIL

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BACKGROUND AND OBJECTIVES
The eating habits of the Brazilian population have changed significantly in recent decades, and one of the determinants of this is the transformation of food environments, including food acquisition locations. This study objective to describe the temporal trend of food acquisition locations in Brazil from 2002 to 2018.
METHODS
The latest data from the Household Budget Surveys (2002-2003, 2008-2009, and 2017-2018) were used, providing the most up-to-date information on food acquisitions, including their purchase locations. Six categories of food acquisition locations were analyzed: supermarkets; minimarkets; fresh produce; bakeries, butcher shops, and others (fish markets, restaurants, bars, and cafeterias). The quantity of food acquired (grams and liters) at the purchase locations was converted into calories. Subsequently, the share of each acquisition location in the total calories purchased was estimated. Simple linear regression models were applied to assess the statistical significance of temporal changes in the caloric share of each purchase location.
RESULTS
There was a significant and statistically meaningful increase in the share of purchases made in supermarkets, rising from 52.94% of acquired calories in 2002-2003 to 60.57% in 2008-2009 and reaching 72.75% in 2017-2018. This growth was accompanied by a significant reduction in the share of minimarkets, which dropped from 30.38% in 2002-2003 to 20.01% in 2008-2009 and fell to 9.32% in 2017-2018. Regarding fresh produce, there was a sharp decline between 2002-2003 (7.79%) and 2008-2009 (3.75%), followed by stagnation in 2017-2018 (3.68%). Lastly, bakeries and butcher shops didn't show statistically significant changes over the period. Bakeries accounted for 7.43% in 2002-2003, rose to 7.90% in 2008-2009, and decreased to 6.87% in 2017-2018. Meanwhile, butcher shops recorded 2.66% in 2002-2003, increased to 3.01% in 2008-2009, and declined to 2.63% in 2017-2018.
CONCLUSIONS
The growing share of supermarkets in Brazilian food purchases reflects a significant environmental change, weakening small establishments and strengthening large retail chains. This shift may lead to a monopoly in food supply, affecting availability and prices, directly influencing consumer choices and, consequently, the quality of diets.
CONFLICTS OF INTERESTS
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EPO5_090

ACCEPTABILITY OF ANTENATAL MULTIPLE MICRONUTRIENT SUPPLEMENTATION COMPARED TO IRON AND FOLIC ACID SUPPLEMENTATION IN PREGNANT WOMEN: A NARRATIVE REVIEW

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BACKGROUND AND OBJECTIVES
This review examines the acceptability of multiple micronutrient supplements (MMS) vs iron and folic acid (IFA) in pregnant women from low- and middle-income countries (LMICs) and proposes a comprehensive acceptability framework for future research and programs**.**
METHODS
We identified 602 studies from Embase, Medline, Scopus databases, selecting 21 for full-text review. Inclusion criteria covered MMS and/or IFA trials in women of reproductive age, assessing acceptability (e.g., sensory, ease of consumption, cultural, socioeconomic factors), adherence, and both qualitative or quantitative data.
RESULTS
Five of the 21 studies defined acceptability definition or outlined constructs for assessment, leading to our proposed definition of acceptability: "*Acceptability is the (comprehensive assessment of) pregnant women's willingness and satisfaction in integrating the intervention (i.e., MMS) into their daily routine and involves evaluating factors such as sensory attributes (e.g., taste), ease of consumption, and overall pregnancy experience (e.g., side effects), recognizing cultural nuances and individual preferences. It extends beyond adherence, encompassing cultural appropriateness, socio-economic considerations, and the overall compatibility of the MMS with individual preferences and lifestyles*." Three peer-reviewed articles and 3/5 case studies fit the inclusion criteria. MMS showed higher acceptability than IFA in effectiveness studies (n=4; 3 non-peer reviewed) vs efficacy trials (n=2), driven by fewer side effects and perceived benefits such as positive pregnancy experience, improved energy, appetite, and mood. Facilitating factors included cost parity, trust in health providers and services, and availability, while barriers included unpleasant smell and taste, rumors, lack of family support, cost, and healthcare access. MMS adherence was higher in 2/5 effectiveness studies and 1/2 efficacy trials with fewer side effects than IFA in most cases.
CONCLUSIONS
This review proposes a comprehensive definition of acceptability and emphasizes its role in improving the acceptance of prenatal micronutrient supplements. Public health programs in LMICs should consider the multifaceted nature of acceptability of MMS from the perspective of deliverers and recipients, addressing cultural, sensory, and socioeconomic factors.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_091

EFFICACY OF NAFEEDTA-FORTIFIED WHEAT FLOUR IN COMBATING IRON DEFICIENCY ANEMIA IN MOROCCAN WOMEN

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BACKGROUND AND OBJECTIVES
Iron deficiency anemia (IDA) remains a significant public health challenge in Morocco, with dietary inhibitors such as polyphenols and phytic acid impairing non-heme iron absorption. Despite efforts to enrich wheat flour with elemental iron, anemia persists. This study evaluates the bioavailability and efficacy of NaFeEDTA as an alternative iron fortificant to address these inhibitory effects. Specifically, it aims to assess the effectiveness of NaFeEDTA-fortified bread, consumed alone or with green tea, among anaemic and non-anaemic Moroccan women of reproductive age.
METHODS
A total of 46 women of reproductive age were divided into two groups: anaemic (AG; n=21, aged 19–39 years) and non-anaemic (NAG; n=25, aged 18–41 years). Two test meals were used in this study. In Meal 1, Na57FeEDTA was added to the brioche, accompanied by 300ml of water. In Meal 2, Na58FeEDTA was added to the brioche, along with 300ml of green tea. After six days, a crossover design was implemented, allowing each participant to serve as their own control. Fractional iron absorption (FIA) was measured by analyzing erythrocyte incorporation of 57Fe and 58Fe markers 14 days post-ingestion, using inductively coupled plasma mass spectrometry (ICP-MS).
RESULTS
The mean fractional absorption (MAF) of iron NaFeEDTA was 36.7% (range: 24.2-39.8) in AG and 16.7% (range: 9.2-24 ,2) in NAG ($p < 0.001$) from a test meal consumed with water and 4.1% (2.8-6.1) in AG and 1.4% (0 ,8-2,9) in NAG from a test meal consumed with tea. The mean inhibition was almost equal to 87.5% and 86.2% respectively in AG and NAG. The AFM was 2 times greater in case of iron deficiency anemia
CONCLUSIONS
NaFeEDTA demonstrates high bioavailability, particularly among anaemic women, and its use as a wheat flour fortificant can significantly address IDA in Morocco. While tea consumption reduces iron absorption, it remains sufficient to meet daily requirements. Public health strategies promoting tea consumption an hour before or after meals could further enhance intervention outcomes. The fortification of wheat flour with NaFeEDTA offers a sustainable solution to reduce the burden of IDA in Morocco.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_093

EATING FOR TWO: “DO PREGNANT WOMEN IN RURAL AREAS MEET THEIR REQUIREMENTS FOR NUTRIENT INTAKE AND DIETARY DIVERSITY?"

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BACKGROUND AND OBJECTIVES
Adequate Nutrition is crucial during pregnancy for the health and well-being of the mother and foetus. Every year, about 800,000 pregnant women die globally with 90% from developing countries and 20% from Nigeria. Despite numerous interventions aimed at tackling this problem in developing countries, challenges still persist with inadequate intake of nutrient and dietary diversity of second-trimester pregnant women. Therefore, this study assessed nutrient intake and dietary diversity of rural pregnant women from two selected Local Government Area (LGAs) in Ibadan, Nigeria.
METHODS
A cross-sectional study involving 140 second-trimester pregnant women recruited from five rural communities in each of the selected LGAs. A semi-structured, interviewer-administered questionnaire was used to obtain information on socio-demographic characteristics, 24-hour dietary recall assessed nutrient intake and Food Frequency Questionnaire to assess dietary diversity of the women. Data was analyzed using descriptive, Inferential Statistics and Esha food processor for nutrient analysis. Women Dietary Diversity Score (WDDS) were categorized as low (0-3), minimum (4-5) and high (6-9).
RESULTS
Mean age was 27.83±6.32 and 29.19±6.3 in both LGAs. Few percentages of women in both LGAs consume foods rich in Folate (6.02% vs7.80%); Calcium (10.84% vs 2.60%); Iron (10.84% vs 2.60%); Zinc (16.87% vs27.2%); Iodine (1.2% vs1.3%); Vitamin C (12.5% vs 5.58) and Vitamin A (10.8% vs7.80%). Minimum DDS for Lagelu and Egbeda LGAs were (58.6% vs 51.4%) while a negative moderate correlation was observed with WDDS and marital status in Lagelu LGAs.
CONCLUSIONS
To address these nutritional needs, tailored intervention programs should be designed specifically for rural pregnant women.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_094

SETTING TARGETS FOR A GRADUAL SODIUM REDUCTION PROGRAM IN URUGUAY: COMPARISON WITH REGIONAL BENCHMARKS AND ANALYSIS OF REDUCTION STRATEGIES

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BACKGROUND AND OBJECTIVES
Purpose: The objectives of the study were to: i) assess the sodium content of food products available in the Uruguayan market, ii) evaluate progress in achieving regional sodium reduction benchmarks; and iii) compare two approaches to gradual sodium reduction -maximum targets and gradual percentage reductions- considering potential effectiveness and sensory perception thresholds.
METHODS
Methods: This study employed a cross-sectional design. Information from the labels of all processed and ultra-processed products available at nine supermarkets in two cities was collected using a smartphone application. Information about sodium content was extracted from the food labels. Data were analyzed using descriptive statistics. The Mann-Whitney U test was used to assess differences in the sodium content following the two reduction strategies
RESULTS
RESULTS: A total of 4,719 products were analyzed, wich had a median sodium content of 389.3 mg/100 g. When comparing median sodium content to the targets set by the Pan American Health Organization (PAHO) for 2021, 32 of the 62 subcategories exceeded the established benchmarks, while 30 subcategories fell below them. Products with a sodium content above the PAHO threshold required a median reduction in sodium content ranging from 4.1% and 69.7%. At the aggregate level, percentage reductions were significantly more effective in reducing sodium content compared to maximum target strategies based on the 50th or 75th percentile.
CONCLUSIONS
Conclusion: RESULTS from the present work underscore the need to adapt regional targets for the development of a sodium reduction program in Uruguay. The advantages of a sodium reduction program based on combining percentage reductions and maximum targets are discussed.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_095

THE IMPACT OF TAILORED HOME-BASED CARE AND COUNSELLING INTERVENTION ON CHILD GROWTH

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BACKGROUND AND OBJECTIVES
This research investigates the impact of a tailored home-based counseling and care intervention on child health outcomes among vulnerable populations.
METHODS
The research was a community-based trial nested in a longitudinal prospective cohort study. The study involved two groups: vulnerable newborns receiving the intervention and healthy newborns who served as controls. The intervention lasted 6 months, the critical postpartum period and all two groups were followed up for six months. The intervention focused on strengthening the capacity of primary-level health facilities to provide post-discharge support to mother-newborn pairs. 223 each of high-risk and normal newborns were recruited. Data was generated through monthly visits using a checklist. Analysis was done using a proportion t-test and linear regression.
RESULTS
Infants in the intervention group experienced a 72.5% reduction in wasting compared to 61.7% in the control group. Moreover, the intervention group exhibited faster growth (‘catch up’) compared to the control group at visit 4, as every one-month increase in the age of the intervention group led to 452 grams increase in weight ($p = 0.000$, 95% CI: 0.281 – 0.623) compared to only 107 grams among the control group ($p = 0.024$, 95% CI: 0.014 – 0.201), reflecting improved nutritional outcomes.
CONCLUSIONS
These findings underscore the effectiveness of tailored home-based care and counseling interventions in enhancing child health outcomes. Therefore, to reduce neonatal mortality rate, interventions should be tailored and implemented during the postnatal period or the so-called “fourth trimester”.
CONFLICTS OF INTERESTS
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EPO5_096

PREVALENCE, ATTITUDES, AND PRACTICE RELATED TO FOOD SUPPLEMENTS USE: INSIGHTS FROM THREE WESTERN BALKAN COUNTRIES

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BACKGROUND AND OBJECTIVES
Food supplements are often associated with a healthy lifestyle. Despite the rising market and popularity, some regions and countries lack surveys on intake and practices related to these products. This study aimed to assess the prevalence, attitudes, practices, and factors associated with food supplement use in three Western Balkan countries.
METHODS
The survey was conducted among adults in Serbia, Montenegro, and the Republic of Srpska (Bosnia and Herzegovina) using an online self-administered questionnaire between July and October 2024. The questionnaire comprised 46 items covering socio-demographic, economic, lifestyle, diet, and food supplement domains.
RESULTS
According to the collected survey data, over 70% of participants consumed at least one food supplement during the past year. The most commonly used food supplements in all three countries were vitamin and/or mineral supplements, followed by probiotics, omega-3, and herbal supplements. The main general reason for using food supplements was to maintain overall health, while specific reasons were immune and energy support. Food supplement use was associated with more favorable health status and lifestyle habits. Self-reported level of knowledge, beliefs regarding food supplements, and factors influencing consumers' intention to purchase food supplements varied among countries. Adverse effects related to food supplement use were reported by 4% of participants.
CONCLUSIONS
The RESULTS of this study provide valuable insights into the prevalence and practice related to food supplements in three Western Balkan countries. Further research is needed to identify the targets for public health interventions to promote rational and safe food supplement use.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_097

PREDICTORS OF CAREGIVER SATISFACTION WITH THE STATE OF RHODE ISLAND SPECIAL SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS AND CHILDREN

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BACKGROUND AND OBJECTIVES

Previous evaluations of the special supplemental nutrition program for women, infants and children (WIC) have been associated with positive health outcomes in women and children. However, these evaluations have not examined the WIC program from the caregiver's perspective in the state of Rhode Island. Hence, the aim of this study was to determine the factors influencing caregiver satisfaction with WIC.

METHODS

This cross-sectional study involved 163 caregivers receiving online or in-person WIC services in Rhode Island. Data was collected on socio-demographic characteristics, experiences with WIC, awareness of WIC services and caregiver satisfaction using a self-administered semi-structured questionnaire. Using a 3-item Likert scale (dissatisfied, neutral, satisfied), caregivers rated their satisfaction on customer service, duration of appointment and overall satisfaction with WIC. An ordered logistic regression model was used to determine the predictors of overall satisfaction with WIC.

RESULTS

The mean age of the caregivers was 30 years, 52.8% were high school graduates, about half were non-Hispanic, and 52.8% were unemployed. Eight percent of the caregivers reported difficulties with WIC while 14.7% suggested changes to improving access to WIC. The frequently reported difficulty was "the WIC foods were not available or easily found". The commonly reported change was "make it easier to identify WIC products in stores". For a unit increase in overall satisfaction, the odds of being satisfied with WIC was lower among caregivers who had less than high school education (OR= 0.14, 95% CI= 0.02, 0.79) or some college certificate (OR= 0.16, 95% CI= 0.03, 0.92) as compared to caregivers with college degree or higher. Unlike caregivers who preferred English, caregivers who preferred to receive WIC services in Spanish were 97% less likely to be satisfied with WIC (OR= 0.03, 95% CI= 0.01, 0.09). Caregivers who are currently enrolled in WIC were 13.5 times more likely to be satisfied with WIC as compared to caregivers who have dropped out of WIC (OR= 13.57, 95% CI= 1.74, 25.80). For a unit increase in overall satisfaction, caregivers who received referrals from WIC were 4.6 times more likely to be satisfied with WIC as compared to those who did not receive referrals (OR= 4.63, 95% CI= 1.28, 16.71).

CONCLUSIONS

Educational level, preferred language, currently enrolled in WIC and received referrals from WIC were associated with caregiver overall satisfaction with WIC. These factors should be considered in designing interventions to increase WIC enrolment and continued participation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_098

USING THE DIFFUSION OF INNOVATION THEORY TO UNDERSTAND HOW TRADITIONAL HEALTH BELIEFS WERE PRACTICED IN THE SOCIAL SYSTEM AND INFLUENCED EXCLUSIVE BREASTFEEDING IN PALAWAN, THE PHILIPPINES

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BACKGROUND AND OBJECTIVES
Exclusive breastfeeding (EBF) is vital for maternal and infant health, yet the EBF rate in the Philippines is only 29%. Traditional health beliefs (THBs) have been reported to negatively influence EBF. However, Palawan, a province known for its diverse topographies, ethnic groups, and THBs, remains understudied.
METHODS
This study explored the influence of THBs on EBF in Palawan using the social systems framework of the Diffusion of Innovation Theory (DoI). Sixteen barangays were selected through maximum variation sampling, and 104 individuals, such as lactating mothers, community leaders, traditional healers, and health workers, were interviewed. Data were analyzed inductively to summarize relevant THBs, followed by deductive analysis using DoI relevant to understand how the social systems influenced EBF.
RESULTS
Five types of THBs were identified, varying across regions, with remote areas having more THBs than urban areas. THBs potentially influenced EBF both negatively and positively. The data analysis through the DoI shows people in urban and remote areas had opposite attitudes toward THBs.THBs were widely accepted and passed down by experienced community members. Socioeconomic factors and misunderstandings between health professionals and local people hindered people from seeking medical consultations in remote communities.
CONCLUSIONS
Similar THBs are popular in the Philippines and other Southeast Asian countries. THBs are understudied but could contribute to EBF. More studies should be conducted to deeply understand THBs not just from physical perspectives, but also from social, economic, and cultural perspectives. Training health professionals to understand THBs and build trust with local communities is crucial for promoting EBF effectively.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_099

RISK OF HYPOTHYROIDISM IN MEAT-EATERS, FISH-EATERS, AND VEGETARIANS: A POPULATION-BASED PROSPECTIVE STUDY

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BACKGROUND AND OBJECTIVES
Globally, plant-based diets are gaining in popularity. Whilst their cardiometabolic benefits are well-documented, there is a lack of studies examining the associations between plant-based diets and risk of hypothyroidism.
METHODS
We analysed data from the UK Biobank cohort. Multivariable Cox proportional hazards regression models were used to estimate hazard ratios (HRs) and 95% confidence intervals (95% CIs) for incident hypothyroidism across vegans, vegetarians, pescatarians, poultry eaters, low meat eaters, and high meat eaters aged 40-69 years. Ancillary to this, we carried out logistic regression analyses to evaluate associations between the diet groups and prevalent hypothyroidism (according to International Classification of Diseases (ICD) codes at baseline.
RESULTS
We included 494,437 individuals from the UK Biobank, of which 231,906 followed a high-meat, 236,510 a low-meat, 5,662 a poultry-based, 11,286 a pescatarian, 8,654 a vegetarian, and 419 a vegan diet. During a median (SD) follow-up of 12.7 (± 3.2) years, 24,240 participants developed hypothyroidism. In multivariable Cox regression models without adjustment for body mass index (BMI), none of the diets were significantly associated with the risk of hypothyroidism. However, there was a tendency for a higher risk of hypothyroidism among vegetarians compared to people following a high-meat diet (HR: 1.08, 95% CI: 0.98 - 1.19). After controlling for BMI the association for vegetarians (HR = 1.18, 95% CI 1.07 – 1.30) became stronger and statistically significant. Furthermore, we observed a positive association between a vegetarian (OR: 1.37, 95% CI: 1.14 - 1.63) and a poultry diet (OR: 1.35, 95% CI: 1.10 - 1.63) with hypothyroidism prevalence.
CONCLUSIONS
In the present study, we found a moderately higher risk of hypothyroidism among vegetarians, after controlling for BMI, a potential collider. This slightly higher risk of hypothyroidism among vegetarians, requires further investigation, taking iodine status and thyroid hormone levels into account.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_101

DEVELOPMENT AND VALIDATION OF A CULTURALLY ADAPTED FOOD FREQUENCY QUESTIONNAIRE FOR OLDER ADULTS

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BACKGROUND AND OBJECTIVES

The Food Frequency Questionnaire (FFQ) is a key tool in epidemiological studies for evaluating dietary patterns and their relationship with non-communicable diseases. Until now, our country lacked a FFQ specifically developed and validated for its population. The aim of this study was to develop and validate a FFQ tailored to older adults in the country, taking into account cultural diversity in terms of food consumption.

METHODS

Two 24-hour dietary recalls (24hR) were conducted—one on a weekday and one on a weekend—among a convenience sample of 76 older adults from the capital and border regions, ensuring cultural representativeness. Based on the obtaineddata, a list of 63 food items and food groups most frequently consumed was created. The frequency categories followed Willett's model, with a reference period of the last six months.

The FFQ was validated within 124 older adults, who completed three 24hRs (two weekdays and one weekend day), with the average intake from the three 24hRs used as the reference method. Correlations between both methods were assessed using Pearson and Spearman coefficients, with logarithmic normalization applied when necessary.

RESULTS

The FFQ was proven reliable for the population of older adults of the country, showing varying estimation accuracy depending on the nutrient. Correlations ranged from poor for nutrients like Vitamin A (0.279) to fairfor proteins (0.353) and carbohydrates (0.416), compared to the average of the three 24hRs.

CONCLUSIONS

The developed FFQ is a promising tool for epidemiological studies in older adults in the country, contributing to a better understanding of their dietary patterns and their relationship with non-communicable diseases. Future research should focus on optimizing the questionnaire to improve the accuracy of estimation for certain nutrients.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_104

ENHANCING EARLY DETECTION AND REFERRAL FOR MALNOURISHED CHILDREN

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BACKGROUND AND OBJECTIVES
The 2022 assessment identified 86 children as acutely malnourished using WHZ, compared to 27 using MUAC, showing a discrepancy of 59 children (31%). This highlights the need for innovative methods to improve active case detection. Since MUAC is the primary screening tool, expanding its cut-off points is essential to include more children. Research indicates that early admission to OTP leads to shorter treatment durations and better recovery outcomes, while late admissions result in prolonged treatment due to severe malnutrition and associated complications.

1. To provide evidence supporting the expansion of MUAC criteria for early malnutrition detection, from 12.5 cm to 13.0 cm.
2. To ensure early identification and timely treatment of malnourished children, improving treatment outcomes.

METHODS
Over seven months, CHW regularly screened children in camps using MUAC tape. Children with MUAC up to 13.0 cm were referred to OTP/TSFP centers, where nutrition workers measured MUAC, weight, height, age, and sex to assess malnutrition severity. Children with MUAC between 12.5 cm and 13.0 cm were tracked as study participants. If rescreened and classified as malnourished by WHZ, they were admitted to the OTP/TSFP program.

RESULTS
Over seven months, 687 children (313 boys, 376 girls) with a MUAC of 12.5-13.0 cm were referred for WHZ screening. Among them, 11 (4 boys, 7 girls) had SAM, and 123 (75 boys, 48 girls) had MAM. A total of 134 malnourished children received treatment.
The three centers typically handle 48-70 cases monthly. The expanded MUAC referral added 7-30 cases monthly, identifying 24% (134 of 566) of total malnutrition cases.
Comparing outcomes, MAM cases identified via expanded MUAC had a 100% cure rate, versus 96% for routine screening. No deaths, defaulters, or non-responders were reported in the expanded MUAC group, unlike the 4% non-response rate in routine screening.

CONCLUSIONS
Expanding the MUAC cut-off from 12.4 cm to 13.0 cm could identify 20% more children with acute malnutrition, primarily detecting more MAM cases. This initiative proved effective in early malnutrition detection and improved treatment outcomes for MAM and SAM children. Successful implementation requires stakeholder engagement, community awareness, training, resources, and functional treatment centers.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_107

EFFECT OF MATERNAL AGE ON NEONATAL MORTALITY MEDIATED BY SMALL VULNERABLE NEWBORNS

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BACKGROUND AND OBJECTIVES
Neonatal mortality, with a prevalence of 22 deaths per 1,000 live births in South Asia, remains a critical public health issue.(1) Over half the neonatal deaths are comprised of babies that are born preterm, small-for-gestational age (SGA) or both- also known as small vulnerable newborns (SVNs)- and maternal nutrition and maternal age are key risk factors.(2) Maternal age is associated with neonatal mortality (3-6), but the extent to which this association is mediated by SVN categories, reflecting nutrition status, is unclear. This study examines maternal age, neonatal mortality, and the mediating role of SVN.
METHODS
This secondary analysis uses data from the Nepal Oil Massage Study, a cluster-randomized trial (2007–2011) on neonatal outcomes in rural Nepal (n=29,887 pregnant women). The main outcome is neonatal mortality, with maternal age (categorized as <18, 18-19, 20-24, 25-34, >34 years of age) as the independent variable and SVN as the mediator. SVN was defined as babies born either 1) None: non-preterm and non-SGA, 2) Only preterm: preterm and non-SGA, 3) Only SGA: non-preterm and SGA and 4) Both: preterm and SGA. We used logistic regression to assess maternal age's total effect on neonatal mortality, followed by models including each SVN category (direct effects). Covariates included maternal education, ethnicity, maternal height, interpregnancy interval, antenatal care, child sex, and multiple births. Analyses were stratified by parity (nullipara vs. multipara).
RESULTS
Among nullipara, maternal age showed no significant association with neonatal mortality. Among multipara, babies had a high mortality risk born to women aged >34 compared to those born to women aged 20–24 [Odds ratio (OR)=1.73, 95% CI: 1.17-2.50]. Adding "only preterm" reduced the effect but not significant(OR=1.36, 0.60-3.08), while adding "Only SGA" significantly increased the effect (OR=2.08, 1.27-3.41). Adding "both" reduced the effect but not significant (OR=0.96,0.42–2.23).
CONCLUSIONS
Maternal age >34 in multipara women is associated with higher neonatal mortality, effect amplified by SGA status of the baby, highlighting the influence of maternal nutrition. Interventions improving maternal nutrition could reduce SGA births and neonatal mortality in older multipara women.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_110

UNDERSTANDING AND ENHANCING INDIVIDUAL NUTRITION COUNSELING BY SCHOOL NUTRITION TEACHERS: CURRENT PRACTICES AND CHALLENGES

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BACKGROUND AND OBJECTIVES
In Japan, the nutrition teacher system plays a central role in promoting school-based nutrition education. One of the key responsibilities of nutrition teachers is to provide individual nutrition counseling. However, there is a need to enhance this counseling to address the diverse health issues faced by students, including overweight, obesity, and underweight. This study aims to examine the current state of individual nutrition counseling provided by nutrition teachers, identify associated challenges, and clarify the factors necessary for the implementation and continuation of such counseling.
METHODS
A self-administered anonymous questionnaire survey was conducted between November and December 2024, targeting nutrition teachers in four prefectures in Japan. A total of 168 nutrition teachers participated in the survey. The questionnaire included items on basic demographic attributes, perceptions of individual counseling, implementation status, and perceived challenges. Descriptive statistics, chi-square tests, and Fisher's exact probability tests were used to analyze differences between groups based on counseling, implementation, and continuation status.
RESULTS
Among the participants, 54 nutrition teachers (32.1%) reported implementing individual counseling, while 114 (67.9%) did not. Within the implementation group, 63.0% indicated their efforts were self-initiated, and 51.9% responded that counseling was conducted upon request from school nurses. Regarding the perceived necessity of counseling among school staff, 96.3% of school nurses, 83.4% of homeroom teachers, and 83.3% of administrators acknowledged its importance. In contrast, within the non-implementation group, a significantly higher proportion expressed interest in learning how to establish a cooperative system within the school to enable counseling ($p=0.032$). Additionally, among those who implemented counseling, 19 (35.2%) reported continuous counseling efforts, while 35 (64.8%) did not. In the continuation group, the initiation of counseling by nutrition teachers themselves was significantly higher ($p=0.017$) compared to the non-continuation group.
CONCLUSIONS
The findings suggest that establishing a support system through collaboration with school staff, particularly school nurses, is critical for the successful implementation of individual nutrition counseling. Furthermore, fostering nutrition teachers' initiatives and enhancing their counseling skills are essential for sustainable efforts. Addressing these factors may contribute to more effective nutrition education and better health outcomes for students.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_111

NUTRITIONAL, ANTINUTRITIONAL AND SENSORY CHARACTERISTICS OF PUFF-PUFF ENRICHED WITH CIRINA FORDA (WESTWOOD) POWDER

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BACKGROUND AND OBJECTIVES
Pastry snacking is highly prevalent among young adults in Nigeria. It substantially contributes to their energy intake but is nutrient-poor. Due to budgetary and lifestyle constraints, young adults are nutritionally vulnerable; hence, there is a need to enrich existing snacks. The paucity of research on puff-puff necessitated this study. *Cirina forda* (Westwood) is a nutrient-dense, cheap, indigenous edible insect; therefore, this study was designed to develop and determine the nutrient, antinutrient content, and acceptability of *Cirina forda*-enriched puff-puff.
METHODS
Three samples were prepared (100:0, 95:5 and 90:10 of wheat flour to *Cirina forda* powder) using a standardized recipe. The samples' proximate, minerals, vitamins and antinutrient contents were analyzed using AOAC (2005), flame photometry, atomic absorption spectrophotometry, and spectrophotometric methods, respectively. Sensory evaluation was conducted on a 9-point hedonic scale using 30 semi-trained panelists among undergraduates of University of Ibadan. RESULTS were compared using ANOVA at $p<0.05$.
RESULTS
Samples 90:10 (7.83%) and 95:5 (7.33%) had higher protein content compared to the control (1.93%) ($p<0.05$). The control had the highest fat content (19.25%). Sample 90:10 provided 110mg, 2.19mg, 1.75mg, 22.15µg; sample 95:5 provided 100mg, 2.09mg, 1.65mg, 21.04µg; while sample 100:0 provided 60mg, 1.66mg, 1.34mg, 16.53µg of calcium, iron, zinc and vitamin A, respectively. Antinutrient values were negligible. Sample 100:0 (control) had the highest sensory scores followed by Sample 95:5, while Sample 90:10 scored the lowest.
CONCLUSIONS
Puff-puff enriched with *Cirina forda* at 5% inclusion level produced a nutritious snack accepted by young adults, hence, commercial adoption is recommended for better nutrition outcomes among this population.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_112

INTEGRATING A DIGITAL TECHNOLOGY TO SUPPORT FOOD FORTIFICATION TRACEABILITY: A CASE STUDY OF THE DIGITAL FORTIFICATION QUALITY TRACEABILITY PLUS (DFQT+) PILOT IN NIGERIA, BANGLADESH, AND INDIA

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BACKGROUND AND OBJECTIVES
Food fortification is proven to reduce micronutrient deficiencies when high-quality fortified foods are available and consumed by populations. Consistent collection and use of data across the fortification value chain is necessary to monitor if this is achieved. However, challenges to monitoring include limited investment and/or willingness to collect/share data, which create barriers to traceability of quality from inputs to market.
The objective is to describe how the Digital Fortification Quality Traceability Plus (DFQT+) technology (a system that enables traceability of micronutrient/fortified food quality across the value chain) was integrated into edible oil fortification programs in Bangladesh, India, and Nigeria and summarize learnings.
METHODS
We describe the integration process, assess the barriers and facilitators, and summarize the implications for those involved and the programs.
RESULTS
A consortium of partners, including non-governmental organizations, micronutrient suppliers, technology experts, among others, successfully integrated the DFQT+ in each country through an iterative process. Barriers to successful integration included a need for interoperability with existing systems, weak enabling environment, and capacity constraints among development and implementing teams. Facilitators included a mandatory regulatory landscape, cross-country sharing of learnings, an agile approach (e.g., iterative, human-centric), and inclusion of key stakeholders/champions. Consideration of the context and enabling environment was critical for success.
CONCLUSIONS
The DFQT+ technology can effectively trace micronutrient/fortified food quality and provide essential data for monitoring program performance and potential for impact. These learnings can inform further pilot and scale up efforts and integration of the technology in other countries and to more users and food vehicles.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_113

STAKEHOLDER EXPERIENCES AND PERSPECTIVES ON THE IMPLEMENTATION, PROCESSES, AND IMPACT OF INTEGRATED NUTRITION INTERVENTIONS IN UGANDA: APPLYING THE RE-AIM FRAMEWORK FOR FUTURE PROGRAM DESIGN AND SUSTAINABILITY

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BACKGROUND AND OBJECTIVES
Malnutrition remains a major public health issue in Uganda contributing to high morbidity and mortality. Despite ongoing efforts to address these issues, there is lack of evidence on the experiences, processes, & perspectives of all stakeholders—including implementers and beneficiaries of integrated nutrition interventions. This knowledge gap impedes the understanding of implementation challenges and restricts efforts to improve program design, effectiveness, and sustainability, hindering the successful scaling and impacts.
Objective: To explore experiences of implementers & beneficiaries of Uganda's integrated nutrition program & examine the knowledge, perceptions, perspectives of stakeholders (policy & decision-makers, implementers & beneficiaries) following program implementation.
METHODS
A cross-sectional qualitative design with participatory action research approach was used to examine the experiences and perspectives of stakeholders involved in Uganda's integrated nutrition program-Uganda Community Connector (UCC). Using purposive sampling, 151 beneficiaries and 24 key informants were selected from 6 districts. Ethical approval was obtained from Stellenbosch University (South Africa) & Makerere University's School of Public Health (Uganda). Data were analyzed using Dedoose software to assess five key dimensions: reach, effectiveness, adoption, implementation, and maintenance (RE-AIM framework).
RESULTS
RESULTS show that the UCC effectively targeted high-risk groups (women & <5yrs), leading to improved maternal & child health outcomes & better dietary practices. Households reported adoption of healthier practices for nutrition & health such as WASH, better health seeking behaviors & dietary diversification. Successful implementation was facilitated by integration with local government structures, and stakeholders stressed the importance of continued community and government engagement. However, sustaining these gains was challenging due to financial constraints, shifting national priorities, and gaps in local government funding. Participation in UCC intervention was inconsistent due to cultural, logistical barriers, and time constraints. Youth engagement in agriculture & micro-enterprises was hindered by limited resources and exclusion from decision-making. Other challenges, such as inadequate support for community health workers and environmental shocks affected the UCC's impact.
CONCLUSIONS
While UCC achieved positive impacts, challenges faced in maintaining participation highlights the need for better infrastructure, financial support, and coordination in future initiatives. Continued government involvement are crucial for long-term success.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_114

THE EFFECT OF PHYSICAL ACTIVITY AND MEDITERRANEAN DIET ADHERENCE ON MENTAL HEALTH IN HEALTH MAINTENANCE: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
Lifestyle factors such as adequate and balanced nutrition and regular physical activity contribute positively to the development of both physical and mental health. The goal of this study was to assess how university students' physical activity levels and adherence to the Mediterranean diet relate to their mental health.
METHODS
A total of 187 university students (62.0% F, 38% M) participated in the study. We used the MEDAS to assess adherence to the Mediterranean Diet, the International Physical Activity Questionnaire (IPAQ-SF) to assess physical activity status, and the Warwick-Edinburgh Mental Well-being Scale Short Form (WEMWBS-SF) to assess mental well-being. A total score of 7 and above on the Mediterranean Diet Adherence Scale (MEDAS) indicates acceptable adherence to the Mediterranean diet, and a score of 9 and above indicates strict adherence.
RESULTS
The mean age of the participants was 20.0±1.28 years, while the mean BMI was 21.0±2.83 kg/m² for female and 23.9±2.78 kg/m² for male. In present study, 74.1% of female and 71.8% of male were in the normal body weight class according to BMI. In addition 63.6% of the individuals did not adherence to the Mediterranean Diet. Also, 50.8% of the individuals had a low activity level, and 16.0% had a high activity level. While there was a significant negative correlation between BMI and IPAQ (r:-0.280 $p<0.001$), no significant relationship was found between MEDAS score, WEMWBS-SF score, IPAQ and BMI ($p>0.05$).
CONCLUSIONS
The study found no relationship between the individuals' adherence to the Mediterranean Diet, physical activity levels, and mental well-being. This may be due to the fact that the rate of those who comply with the adherence to the Mediterranean Diet is low and the rate of those with low physical activity level and those with normal BMI is high. Future studies aim to reach more individuals with different BMIs.

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The authors have no conflict of interest.
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EPO5_116

SPATIAL ANALYSIS AND MAPPING OF CHILD MALNUTRITION AMONG INDIGENOUS PEOPLE IN MALAYSIA

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BACKGROUND AND OBJECTIVES
Child malnutrition remains a pressing health concern among the Orang Asli in Malaysia, exacerbated by disparities in geographical and socioeconomic factors. This study aims to perform spatial analysis and mapping of child malnutrition in urban (Kg. Sg Ruil), fringe (Kg. Kenang), and remote (Kg. Sg Tiang) areas, identifying the patterns and determinants of malnutrition across these settings. Addressing these disparities is critical for designing targeted interventions to improve child health outcomes.
METHODS
This cross-sectional study collected anthropometric data (height-for-age, weight-for-height, and weight-for-age) from Orang Asli children in the three communities. Data on household income, food security, and access to healthcare were obtained through structured surveys. Spatial mapping was conducted using Geographic Information System (GIS) tools to visualize malnutrition prevalence and its association with environmental and infrastructural variables.
RESULTS
RESULTS indicate significant spatial disparities in child malnutrition. In urban Kg Sg Ruil, a rising trend of overweight and obesity was observed (15%), attributed to dietary shifts and reduced physical activity. Fringe Kg Kenang exhibited mixed malnutrition patterns, with 20% undernutrition and 10% overweight, reflecting transitional lifestyles. Remote Kg Sg Tiang showed the highest undernutrition rates (35%), influenced by limited healthcare access and food insecurity.
CONCLUSIONS
This study underscores the importance of spatially targeted interventions to combat child malnutrition among the Orang Asli. Tailored strategies addressing urban dietary shifts, fringe area inequalities, and remote area deprivation are essential. Spatial analysis provides a valuable tool for policymakers to allocate resources effectively and reduce health disparities.
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The authors have no conflict of interest.

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EPO5_117

MACRONUTRIENT EVALUATION OF A NOVEL COMPLEMENTARY FOOD TARGETING VULNERABLE INFANTS AND YOUNG CHILDREN IN ZAMBIA DURING THE FIRST 1,000 DAYS OF LIFE: COMPLEMENTARY FOOD FOR AFRICA+DRIED FISH POWDER (COMFA+FISH) INSTANT PORRIDGE

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BACKGROUND AND OBJECTIVES
Even when consumed in small quantities, dried fish powder (DFP) from small pelagic fish contains nutrients such as iron and zinc in concentrations appropriate for infant feeding, as well as essential fatty acids vital for health. When added to infants and young children's (IYC) complementary foods—such as high carb/low protein maize porridge that is, of necessity, widely consumed on a daily basis by vulnerable IYC across sub-Saharan Africa—DFP can increase the nutrient concentration of the porridge substantially, which can help address the high prevalence of nutrient deficiencies during this vulnerable period of growth.
METHODS
We added 8g of locally sourced DFP to each 50g sachet of ComFA+Fish Instant Porridge to fill macro-/micronutrient gaps among vulnerable IYC. We present data on the porridge's macronutrient composition for IYC ages 6–8 months, 9–11 months, and 12–23 months.
RESULTS
For 6–8 month-olds, they should continue to breastfeed, complementary foods should be provided 2-3 times/day, and the reference weight for this calculation is 7.9–8.9kg. One ComFA+Fish Instant Porridge sachet two times/day provides: 1) 377 kcal (~50% of estimated kcal needs for 6–8 month-olds) [1,2]; 2) 10.8g of protein (~100% of estimated protein needs for 6–8 month-olds) [3-5]; and 3) 1.66g total fat (~5% of estimated fat needs for 6–8 month-olds) [1,3,5]. For 9–11 month-olds, they should continue to breastfeed, complementary foods should be provided 3-4 times/day, and the reference weight for this calculation is 9.3–10kg. One ComFA+Fish Instant Porridge sachet three times/day provides: 1) 565 kcal (~60% of estimated kcal needs for 9–11 month-olds) [1,2]; 2) 16.2g of protein (~134% of estimated protein needs for 9–11 month-olds) [3-5]; and 3) 2.49g total fat (~7.3% of estimated fat needs for 9–11 month-olds) [1,3,5]. For 12–23 month-olds, they should continue to breastfeed, complementary foods should be provided 3-4 times/day, and the reference weight for this calculation is 10.3–13.75kg. Two ComFA+Fish Instant Porridge sachets three times/day provides: 1) 1,131 kcal (~100% of estimated kcal needs for 12–23 month-olds) [1,2]; 2) 32.4g of protein (~270% of estimated protein needs12–23 month-olds) [3-5]; and 3) 4.98g of total fat (~14% of estimated fat needs12–23 month-olds) [1,3,5].
CONCLUSIONS
Based on the RESULTS, we will: 1) adjust the formulation to ensure that recommended serving sizes meet recommended dietary reference intake (DRI) values without compromising acceptability among IYC; 2) conduct Sensory Panels to test the formulation.
CONFLICTS OF INTERESTS
Harleen Kaur MaroakKathleen RagsdaleKendra ByrdMadeline BurdineSlyvia BandaTerezie Tolar-PetersonKatie Roman

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EPO5_118

FORTIFYING MILK WITH VITAMIN D: A SOLUTION TO IMPROVE NUTRITIONNAL STATUS IN VITAMIN D

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BACKGROUND AND OBJECTIVES
Vitamin D has many essential roles in the proper functioning of the body. In its latest opinion published in 2019, the National Agency for Health Safety, Food, Environment and Work (ANSES) triples the nutritional need for vitamin D for the entire population. The objective of this article is to show the interest of vitamin D fortification in milk to improve the vitamin D status of the French population.
METHODS
We analyzed the National Individual Food Consumption Study 3 (INCA3), conducted in 2014-2015 on the French territory to know the nutritional intake of Vitamin D. Then we compared it with the nutritional status in blood thanks to the ESTEBAN study conducted in 2016 in France.
RESULTS
We showed that the dietary intake of vitamin D is significantly lower than the recommendations of ANSES (15 µg/ day) throughout life. This insufficient dietary intake RESULTS in a biological vitamin D status below the plasma deficiency threshold (30 nmol/L). Milk is an everyday food, consumed by most of French people. Numerous studies in the literature show that fortifying milk with vitamin D can be a solution to increase dietary intake of vitamin D and thus compensate for nutritional deficiency.
CONCLUSIONS
In conclusion, the fortification of milk with vitamin D is an effective solution to improve the biological status of vitamin D and thus compensate for a general deficiency in the French population.
CONFLICTS OF INTERESTS
Mathilde Guerville, Charlotte Magnant, Emmeline Salameh, Romane Troadec and Amandine Ligneul are employees of Lactalis Research and Development

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EPO5_119

SCHOOL-BASED NUTRITION INTERVENTIONS IN PERU: A BIBLIOGRAPHIC REVIEW OF THE LAST 10 YEARS

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BACKGROUND AND OBJECTIVES
Globally, over the past 30 years, the prevalence of overweight and obesity among children and adolescents aged 5 to 19 years has increased dramatically, from 8% in 1990 to 20% in 2022. In middle-income countries like Peru, which still face challenges with nutritional deficiencies, the increasing rates of overweight and obesity contribute to a double burden of malnutrition, being a significant public health concern. School-based interventions are emerging as a promising approach to address this issue. This review aims to synthesize the current evidence on the effectiveness of school-based nutrition interventions and identify the key factors that enable or hinder their successful implementation within the country.
METHODS
A bibliographic literature search was conducted in PubMed, Scielo, and Google Scholar databases to identify relevant studies published in the last 10 years (2014-2023), written in English or Spanish. The search strategy included terms related to school-based, nutrition, and obesity prevention interventions.
RESULTS
The review identified six studies that met the inclusion criteria. Most studies (5 out of 6) reported positive impacts of the interventions on students' nutritional knowledge, attitudes, and practices. Several studies showed improvements in dietary behaviors, such as increased consumption of fruits and vegetables and decreased ultra-processed foods. However, the sustainability of these behavioral changes over time and their direct impact on students' nutritional status were less consistent across the studies. Furthermore, the varying methodologies and intervention durations across the studies may have influenced the outcomes.
CONCLUSIONS
Nutritional interventions in schools can improve the dietary habits and nutritional knowledge of school students in Peru. However, there is no standardized evidence on their efficacy, methodology, or effectiveness, and the long-term effectiveness of these interventions on nutritional status remains a challenge that requires further research.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_120

ASSOCIATION BETWEEN ULTRA-PROCESSED FOOD CONSUMPTION, DIETARY INFLAMMATORY INDEX, AND OBESITY PARAMETERS: A REVIEW

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BACKGROUND AND OBJECTIVES
Obesity is a chronic low-grade inflammatory disease characterized by prolonged periods of positive energy balance. It is known that dietary patterns rich in ultra-processed foods are associated with weight gain, overweight and obesity. Many mechanisms have been proposed to justify this association, and the role of dietary inflammation, which the dietary inflammatory index can measure, is often discussed. However, the associations between the consumption of ultra-processed foods, dietary inflammatory index, and obesity parameters are not yet clear in the literature. This work aims to carry out a literature review on the association between the consumption of ultra-processed foods, dietary inflammatory index and obesity parameters.
METHODS
This is a narrative literature review conducted between January and May 2024. The keyword “Ultra-processed foods” was combined with the boolean operator “AND” to the outcomes of interest: “Weight Gain”,” Overweight”, “Obesity’, “Adiposity” and “BMI” in the database Pubmed. The same was done for “Ultra-processed foods” with “Dietary Inflammatory Index”. Original studies conducted on humans, which focused on analyzing the association between the consumption of ultra-processed foods and the inflammatory index of the diet were selected, while reviews and studies using animal models were excluded.
RESULTS
Ecological studies demonstrate positive associations between diets rich in ultra-processed foods and higher rates of obesity. Cross-sectional studies have identified that individuals with higher consumption of ultra-processed foods present higher inflammatory scores, as well as a greater prevalence of overweight and obesity. Cohort studies frequently show that greater consumption of ultra-processed foods is associated with increased body weight and adiposity, in addition to higher dietary inflammatory index scores. Overall, dietary inflammation is hypothesized to be a mechanism through which ultra-processed foods contribute to weight gain, but there is a lack of studies specifically testing this hypothesis, such as using mediation analysis.
CONCLUSIONS
Despite the limitations, the findings converge on the idea that ultra-processed foods contribute to a pro-inflammatory dietary pattern and are associated with obesity parameters, however, prospective studies that test the mediating effect of inflammation are needed. These RESULTS highlight the importance of public policies aimed at reducing the consumption of ultra-processed foods.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_122

THE PATHWAYS BETWEEN MOTHERS' EXPOSURE TO DOMESTIC VIOLENCE AND CHILD GROWTH: A CAPABILITY APPROACH TO CLIMATE-VULNERABLE HAOR AREAS OF BANGLADESH

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BACKGROUND AND OBJECTIVES
Healthy child growth outcomes are determined by the parental/caregiver's capabilities to provide good care to the children to grow well, built on Amartya Sen's concept of the capability approach. Evidence shows that mothers who are deprived of the capability to stay away from violence are deprived of the capability to provide good care to children. We intend to analyse how mothers' capabilities to stay away from domestic violence may shape the multidimensional child growth outcomes in climate-vulnerable haor areas of Bangladesh.
METHODS
A qualitative study using a participatory approach was conducted in three sub-districts from Sunamganj, Habiganj and Kishorganj districts that are dominated by haor (low-lying areas) and subject to long term flood. Parents having children under two years old participated in the study. Specific interview guides shaped the interviews and focus group discussions in the first round (from Dec 2016 and January 2017), whereas visual tools were used to facilitate the discussions in the second round (February 2019). Eight IDIs and 25 focus group discussions were conducted with fathers and mothers. Inductive codes were generated and matched with the constitutive elements of the capability approach to extract the findings.
RESULTS
The participants highlighted that a mother's capability to stay away from violence affects her capability to provide good care to the child and compromises healthy child growth. Deprivation of this capability depresses her motivation to feed and take care of herself and her child. It affects her capability of being healthy and nourished and her capability of expressing love and affection to the child. A range of factors lead to domestic clashes, including long-term floods and unpredicted seasonal calamities and subsequent agricultural loss and financial insufficiency, lack of education leading to a large number of children, and high temper of the husband or couples, men's addiction to wine, cannabis, and extramarital affairs, women's lack of access to financial resources and social acceptance of yelling or beating on wives .
CONCLUSIONS
The findings shed light on the pathways between violence, love and care, nutrition and child growth outcomes using the notion of human capabilities. The contextual insights can be incorporated into the existing nutrition-sensitive intervention programmes to address the social challenges for achieving healthy child growth outcomes in haor.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_125

BEYOND HEALTH: SCOPING REVIEW OF THE WIDER IMPACT AND INFLUENCE OF ULTRA-PROCESSED FOODS IN FOOD SYSTEMS

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BACKGROUND AND OBJECTIVES
Most research on Ultra-Processed Foods (UPF) directly focuses on health outcomes associated with consumption of UPF, with less emphasis on its wider role in the economy and the environment, as well as its impacts on food systems. This scoping review aims to synthesize the current literature and to identify evidence gaps beyond direct health impacts.
METHODS
Comprehensive searches across PubMed, Scopus, and Web of Science was conducted in January 2025 to assess the existing evidence on UPFs. Only reviews conducted in a systematic way and assessing UPF beyond health or diet outcomes, were included. No restrictions were applied to date of publication or language. Included reviews were organised by themes and synthesised in a narrative summary.
RESULTS
Of the 256 reviews identified on UPFs, only eleven were focused on non-health aspects. All reviews were recent (2020-2024), written in English, and most were from Australia. Funding was reported in all reviews and was of low risk of bias. These reviews focused on four broad themes. Theme 1 'Policy, governance, and systemic drivers of UPF consumption' (n = 5), presented the power of UPF corporations to influence research and prevent, delay, dilute or modify policymaking. Theme 2 'Corporate influence and market practices' (n = 4), demonstrated the macroeconomic incentives towards continued increase in sales of UPFs. Theme 3 'Environmental impact' (n = 1), investigated the pollution involved in the life cycle of UPFs. Theme 4 'Methodological quality of UPF research' (n = 1), stated methodological issues on systematic reviews with meta-analysis on UPF. Identified gaps related to solutions on how to manage the power and influence of UPF corporations (Theme 1), and on how to tackle the rules of the system towards incentives for healthier food production (Theme 2), as well as the need of further research about the environmental impact of UPF (Theme 3). No further gaps were identified regarding Theme 4.
CONCLUSIONS
There is a need for future research to address knowledge gaps relating to the impact of UPFs in relation to their environmental impact, and how to best develop policies and governance systems to regulate UPFs.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_126

TRENDS IN NUTRIENT CONSUMPTION AMONG UNDERNOURISHED WOMEN OF REPRODUCTIVE AGE IN AN URBAN SLUM OF A LOW- AND MIDDLE-INCOME COUNTRY (LMIC): COMPARATIVE ANALYSIS BETWEEN 2017 AND 2024

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BACKGROUND AND OBJECTIVES
Dietary intake patterns of children and women of reproductive age residing in urban slums have been influenced by several factors between 2017 and 2024, such as rising food prices, economic disparities, geopolitical issues, and the lingering effects of the COVID-19 pandemic. These factors have led to shifts in the nutrient consumption patterns, with many households turning to processed foods that do not meet nutritional needs. This study aimed to compare the data on nutrient consumption between 2017 and 2024 for age- and nutritional status-matched non-pregnant women of reproductive age residing in an urban slum.
METHODS
The 2017 data was collected from a completed study of undernourished (body mass index, BMI < 18.5 kg/m²) non-pregnant women of reproductive age (18-35 years) residing in a major urban slum of the country. In 2024, similar data was collected from women of the same age and nutritional status from an ongoing study living in the same slum. Nutrient consumption was recorded using 24-hour dietary recall, with reference values derived from Dietary Reference Intake (DRI) guidelines as outlined by the National Institutes of Health (NIH).
RESULTS
Dietary consumption of 101 women (43 from 2017, 58 from 2024) showed significant reductions in various nutritional parameters. Socio-demographic parameters showed no major differences, except for a significant drop in median family income, from USD 181 in 2017 to USD 125 in 2024 ($p<0.05$). Total energy, protein (including first class protein), fat, and carbohydrate intake significantly decreased from 2017 to 2024 ($p<0.05$). In 2024, only 29% of women consumed adequate total energy and 55% consumed adequate protein, compared to 55% and 88% in 2017, respectively ($p<0.05$). In 2024, average intake of calcium and iron was only 24% and 57% of the recommended daily allowances (RDAs), respectively; and intake of vitamins B2, B12, C, E, and folate was only 46%, 21%, 43%, 14%, and 22% of their respective RDAs. The consumption of each of these micronutrients, again, showed a significant decline compared to 2017 ($p<0.05$).
CONCLUSIONS
The study suggests that nutrient consumption among women in the urban slum significantly decreased between 2017 and 2024, likely due to economic pressures, food insecurity, and shifts toward processed foods. Further studies are recommended for investigating and addressing this issue and improve dietary habits in such populations.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_128

ENHANCING BREASTFEEDING PRACTICES OF PREGNANT WOMEN THROUGH COMMUNITY-BASED DRAMA IN SELECTED RURAL COMMUNITIES

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BACKGROUND AND OBJECTIVES
While the use of drama for educational and entertainment purposes are well-established, its application in scientific research is still emerging. This study, therefore, investigates the impact of community-based drama on breastfeeding knowledge and practices of pregnant women in selected rural communities in Ibadan, Oyo State, Nigeria.
METHODS
The study employed a quasi-experimental design. 200 second trimester pregnant women were randomly selected from 10 communities and assigned into experimental (100) and control (100) groups. Data on socio-demographics, breastfeeding knowledge and practices were obtained using Computer Aided Personal Interview at baseline and endline. The intervention group received a four-episode drama while the control group received health talk for a period of two-weeks each. Descriptive and inferential statistics were used to analyse obtained data at 5% level of significant.
RESULTS
Mean age were 27.3±6.0 and 28.3±6.7 for intervention and control groups respectively. Breastfeeding knowledge mean score increased from (13.62 ±4.45) at baseline to (17.97±2.29) at endline for intervention and from 13.96±4.20 at baseline to 16.71±2.33 at endline for control group. A slight increase occurred in breastfeeding practices from 6.07±1.20 at one month to 6.14±1.09 at three months for the intervention group and from 5.62 ±1.35 to 5.62±1.33 for the control group. A statistically significant relationship occurred between breastfeeding knowledge and breastfeeding practice mean score at one and six months. Age, parity and income were identified as strong predictors for breastfeeding knowledge and practices.
CONCLUSIONS
Community-based drama significantly improved breastfeeding knowledge and practices of rural women, hence highlighting its potential as an effective intervention.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_130

FOOD FORTIFICATION STRATEGIES IN THE FIGHT AGAINST CHILD MALNUTRITION: SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES
Child malnutrition is one of the main causes of morbidity and mortality among infants and children in Africa. To prevent malnutrition or reduce its consequences, several strategies are implemented. The present study carried out a systematic review of food fortification strategies in the fight against child malnutrition.
METHODS
Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) method with the main search keyword “food fortification in Africa” was used to select 8 articles out of the 574 initially considered. The target groups were children aged 0-5 years.
RESULTS
In some studies, children's weight and height respectively increased from 7.8 to 12.4 kg and from 71.1 to 85.5 cm for the intervention group, and from 7.8 to 11.5 kg and from 71.8 to 83.6 cm for the control group after 6 months of intervention. In other studies, the prevalence of good nutritional status rose from 0 to 45.16% for the treatment group and from 0 to 18.75% for the control group; that of the prevalence of moderate acute malnutrition from 32.26 to 6.45% for the treatment group and from 34.38 to 31.25% for the control group; and that of the risk of moderate acute malnutrition from 0 to 4.16% for the treatment group and from 0 to 18.75% for the control group. control group, and the risk of malnutrition from 67.74 to 48.39% for the treatment group treatment group and from 65.62 to 31.25% for the control group.
CONCLUSIONS
Analysis showed a better improvement in children's nutritional status when supplementation and fortification.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_131

EVALUATION OF THE CONTRIBUTION OF THE NATIONAL INTEGRATED SCHOOL FEEDING PROGRAM TO THE RESILIENCE OF SCHOOL COMMUNITIES

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BACKGROUND AND OBJECTIVES
The National Integrated School Feeding Program (PNASI) is implemented to promote the retention of children in school and improve the learning capacities of schoolchildren. This program also provides for capacity building and the implementation of multisectoral activities for the benefit of local actors. This study conducted in the town of Zè (Atlantic department) focused on the contribution of the PNASI to the resilience of school communities.
METHODS
Three Hundred (300) randomly selected households were surveyed using a mixed quantitative and qualitative approach in 9 school communities, 6 of which benefited from PNASI activities. The information collected during the individual interviews with the households made it possible, on the one hand, to identify the main activities of the PNASI from which the school communities benefited and, on the other hand, to evaluate the effects of these activities on food diversity and the economic vulnerability of school communities.
RESULTS
The RESULTS showed that the school canteen and nutrition education activities are those from which the school communities were able to benefit. In addition, non-PNASI school communities have an average Food Diversity Score (6.30) significantly higher than that of PNASI school communities (5.72; p=0.001) but have an average share of food expenditure (59.10%) higher than that of the PNASI school communities (57.51%), but without significant differences (p=0.3094).
CONCLUSIONS
It appears that apart from school meals for schoolchildren, the PNASI has no significant effects on households in school communities. The increase in complementary activities of the PNASI towards the communities could lead to a real impact on the latter.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_133

ASSOCIATION BETWEEN SEX HORMONES AND BREAST COMPOSITION DURING AND AFTER PUBERTY

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BACKGROUND AND OBJECTIVES
The association between sex hormones and breast density remains unclear, particularly during adolescence when hormonal fluctuations are pronounced. Previous research in young women has linked premenarcheal sex hormone-binding globulin (SHBG) and progesterone to higher percent fibroglandular volume (%FGV). Objective: to evaluate the relationship between sex hormones during and after puberty and breast composition (%FGV and AFGV).
METHODS
This study included 490 participants from a longitudinal cohort of 602 low-income Chilean girls born in 2002-2003. Anthropometric data, breast composition (BC) via dual-energy X-ray absorptiometry (DXA), and fasting blood samples for sex hormones (estradiol, testosterone, androstenedione, progesterone, dehydroepiandrosterone sulfate [DHEAS]) were collected at Tanner stage 4, 2 years post-menarche, and 4 years post-menarche. BC measures (%FGV and AFGV) were calculated using a two-compartment model of adipose and fibroglandular tissue (UCSF-developed software). Associations between hormones and BC were assessed using linear and mixed-effects regression models, adjusted for birth weight, maternal education, BMI z-score, and age at menarche.
RESULTS
At Tanner stage 4 (mean age 11.3 years), 53.3% of participants were overweight. At this stage, androstenedione, testosterone, and estrogens were positively associated with %FGV but not AFGV. Two years post-menarche, no significant associations were observed. By 4 years post-menarche, progesterone was positively associated with %FGV. Mixed-effects models across all periods showed positive associations between testosterone, androstenedione, progesterone, and DHEAS with BC in crude and adjusted models (Table 1). Table 1: Association between sex hormones and Breast Composition during and after puberty.

	%FGV				AFGV			
	Crude		Adjusted*		Crude		Adjusted*	
	B	95%CI	B	95%CI	B	95%CI	B	95%CI
Estradiol(pg/mL)	0.003	-0.02-0.02	-0.00	-0.02-0.01	-0.24	-0.35-(-0.13)	-0.24	-0.35-(-0.12)
Androstenedione(ng/mL)	3.79	2.31-5.28	3.09	1.80-4.37	46.07	34.94-57.20	43.83	32.68-54.98
Testosterone (ng/mL)	17.72	10.75-24.68	13.53	7.63-19.42	152.87	101.51-204.23	147.36	96.17-198.55
DHEAS (ng/mL)	0.002	0.00-0.00	0.00	0.00-0.00	0.04	0.03-0.04	0.04	0.03-0.04
Progesterone (ng/mL)	4.33	2.53-6.13	2.69	1.12-4.25	35.166	21.44-48.89	36.50	22.70-50.30

CONCLUSIONS
Our findings confirm positive associations between progesterone and androgenic hormones with %FGV and, to a lesser extent, AFGV, particularly during puberty and adolescence.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_138

INVESTIGATING HMO-LIKE DIBLOCK MOLECULES AND THEIR IMPACT ON INTESTINAL BARRIER FUNCTION USING IN VITRO MODELS

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BACKGROUND AND OBJECTIVES
The intestinal barrier is critical for gut health and preventing pathogen translocation, particularly in infants, whose immature gut barrier makes them more susceptible to infections and inflammation. Human milk oligosaccharides (HMOs), found naturally only in human breast milk, support gut health and barrier integrity, potentially offering protection against these vulnerabilities. Due to the difficulty and cost of synthesizing HMOs, HMO-like molecules could offer a promising alternative for infant formula supplementation for infants who are not breastfed. This study investigates the protective effects of HMOs and HMO-like diblock molecules on intestinal barrier function using various in vitro models.
METHODS
T84 intestinal epithelial cells were cultured on 96-well ECIS plates to confluency and pretreated with HMOs or HMO-like diblock molecules for 24 hours. Cells were then exposed to disruptors for another 24 hours. Barrier integrity was assessed via trans-epithelial electrical resistance (TEER) using the ECIS system. Post-treatment, cells were collected for PCR analysis of tight junction protein expression. Additionally, the molecules are being tested in LS174T goblet cells to observe effects on the mucosal barrier.
RESULTS
Preliminary RESULTS show that diblock molecules significantly preserved barrier integrity in cells treated with the disruptor A23187, as indicated by increased TEER. This TEER effect was not observed with Tunicamycin, which primarily affected tight junction gene expression. Diblock molecules altered the expression of occludin, claudin-2, and claudin-3. Experiments using LS174T cells are still in progress but will yield further gene expression data.
CONCLUSIONS
HMOs and HMO-like diblock molecules demonstrate potential protective effects against intestinal barrier disruption, possibly by modulating tight junction protein expression. These findings suggest the potential use of diblock molecules as functional ingredients with gut-protective benefits with prospective applications in infant nutrition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_139

CONTEXT-SPECIFIC FOOD-BASED RECOMMENDATIONS TO IMPROVE DIETS OF SCHOOL-AGED CHILDREN IN TWO PROVINCES WITH A HIGH BURDEN OF MICRONUTRIENT INADEQUACY IN THE PHILIPPINES

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BACKGROUND AND OBJECTIVES

Suboptimal diets are a major contributor to the global disease burden and can contribute to malnutrition in all forms. In the Philippines, school-aged children are at high risk of inadequate dietary intake and poor nutritional status. This study aims to identify problem nutrients in the diets of school-aged children and develop food-based recommendations (FBRs) that would meet Recommended Nutrient Intake (RNI) levels for selected nutrients and daily energy requirements using locally available foods.

METHODS

A cross-sectional nutrition assessment was conducted in 2022 among children aged 5-10 years (n=342) at 22 schools in two Philippine provinces. Dietary data were collected using 24-hour dietary recalls. Optifood software was used for a linear programming analysis to identify problem nutrients and formulate FBRs. Problem nutrients were defined as those for which optimized diets were not able to provide 100% of the RNI. FBRs were evaluated based on achieving 65% RNI in the greatest number of assessed nutrients while not exceeding the upper limit for each nutrient.

RESULTS

Calcium was identified as a problem nutrient for children aged 7-10 years, while no problem nutrients were identified for children aged 5-6 years. Anchovies, milk, and chicken liver were nutrient-dense foods available in the local context that could fill the nutrient gaps. The selected FBRs for younger children provided ≥100% of the RNI for protein, vitamin A, thiamin, riboflavin, vitamin C, and iron. It provided 78% and 76% of the RNI for niacin and calcium, respectively. Another set of selected FBRs offered older children ≥100% of the RNI for protein, riboflavin, niacin, and iron. It supported 75%, 90%, 96%, and 93% of the RNI for calcium, vitamin C, thiamin, and vitamin A, respectively.

CONCLUSIONS

Developing FBRs that meet dietary adequacy for all the assessed nutrients was more challenging for children aged 7-10 years than for children aged 5-6 years. Context- and age-specific FBRs could help ensure adequate nutrient intakes among schoolchildren. However, further formative research to examine the feasibility and cost analysis is needed before implementation, such as in the context of school-based feeding programs (SBFPs).

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_140

BREAKING STEREOTYPES IN FOOD AND ACTIVITIES: UNDERSTANDING LINGUISTIC AND COGNITIVE MECHANISMS IN GENDERED CHOICES

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BACKGROUND AND OBJECTIVES
Gender stereotypes impact food preferences: meat is associated with masculinity, and vegetables with femininity (Stanley, Day, & Brown, 2023) These unconscious associations contribute to gender-based dietary patterns (CRÉDOC, 2019), which exacerbate public health challenges, such as widespread iron deficiency among women (70%; WHO, 2004). This study examined two mechanisms perpetuating such stereotypes: the inherence heuristic—a mental shortcut that explains regularities through intrinsic properties (e.g., “Women wear pink because pink is delicate”; Cimpian and Salomon, 2014) — and generics — expressions of generalizations (e.g., “Lions have manes”) with normative force (Berio & Musholt, 2023). Understanding these mechanisms is critical for designing interventions that challenge food stereotypes and encourage balanced diets.
METHODS
We examined gender stereotypes in activities (e.g., sewing; Liben et al., 2002) and food preferences (e.g., men-meat, women-vegetables) using a 3 (genericity: generics vs. "most" vs. "some"; between-subject) x 2 (concordance: stereotypes – e.g. “Women sew” – vs. counter-stereotypes – e.g. “Men sew”; within-subject) design. 242 French participants aged 18–35 provided stereotype endorsement ratings (1–7), with justifications coded for inherent reasoning. Mixed-effects linear regressions analyzed endorsement scores.
RESULTS
Stereotypes received significantly higher endorsement than counter-stereotypes for activities, particularly when justified with inherent properties. Generic statements elicited more inherent justifications than "most" statements. These findings demonstrate that generics and the inherence heuristic influence common activities stereotype endorsement, since they increase overgeneralizations of internal characteristics, often perceived as unchangeable. However, food-related stereotypes showed a ceiling effect on endorsement (e.g., "It is normal that men/women eat meat"), limiting observable differences and likely stemming from the repetitive and survival-driven nature of eating.
CONCLUSIONS
Our findings highlight the role of inherent justifications and generalizing language in reinforcing gender stereotypes for activities but underscore challenges in capturing similar effects for food choices. The methodology for a follow-up study to address these limitations will be discussed, to inform educational initiatives and public health strategies and interventions to reduce gendered food stereotypes and promote balanced diets (e.g. Markman and Bian's, 2020, successful American breakfast interventions).
CONFLICTS OF INTERESTS
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EPO5_141

EFFICACY OF ZINC BIOFORTIFIED STAPLES IN IMPROVING BIOMARKERS OF ZINC STATUS: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

Zinc biofortified staple crops (ZBSC) are low-cost and sustainable solutions to zinc deficiency (ZD) in low- and middle-income countries (LMICs). Several ZBSCs have been developed and released around the world and their efficacy in improving different biomarkers of zinc status has been assessed. Since these studies have reported inconsistent RESULTS, the present study is being conducted with the objective of assessing the efficacy of ZBSCs in improving zinc status through a systematic exploration of literature.

METHODS

Literature search was done in five electronic databases, SCOPUS, Medline, CINAHL, Embase, and Web of Science for randomized controlled trials (RCTs) reporting the efficacy of ZBSCs, such as rice, wheat, maize, pearl millet etc. in improving zinc status reported as any of plasma or serum zinc concentration (PZC/SZC), proportion of ZD, stunting/linear growth, immune function markers, immune status, history of morbidity, zinc intake, or other putative markers such as zinc-dependent enzyme activity, hair/nail zinc content etc. After title and abstract screening, full-text review was conducted, and data was extracted from the included articles.

RESULTS

A total of 1625 articles were initially identified from five databases, out of which seven studies were included in the analysis. Only one study out of six reported a positive change in PZC between intervention and control arms, but only in the midpoint [mean (SD) of difference 41.5 (109.7); p=0.02] which was abolished at the endpoint[p=0.45]. Among two studies that measured morbidity, one study reported improvement in selected morbidities among children and women in the intervention arm while the other found higher morbidities in children receiving ZBSC. No impact on anthropometry was observed in any included study. Putative markers such as enzyme activity for essential fatty acid metabolism (fatty acid desaturases and elongases) and DNA strand break did not show any statistically significant difference. However, there were significant improvements in the hair zinc count in the intervention arm between baseline and endline [mean (SEM) 50 (1.3) vs 59 (1.5), p<0.001], which was not observed in the control arm [mean (SEM) 51(1.9) vs 54 (1.9), p=0.07]. This paper also discussed several methodological or analytical limitations in the included studies.

CONCLUSIONS

PZC, the most reliable biomarker of zinc status at the population level, remains largely unaffected by the consumption of ZBSCs. Future studies addressing various limitations are required to determine the efficacy of ZBSCs in improving zinc status.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_143

URINE SWEETENERS AND SUGARS IN RELATION TO CHILDHOOD OBESITY: THE DUTCH LIFELINES COHORT STUDY

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BACKGROUND AND OBJECTIVES
The roles of low- and no-calorie sweeteners (LNCS) and sugars in childhood obesity remain debated, partly due to limitations in self-reported dietary assessments. This study, part of the EU Horizon 2020 SWEET project, employed a newly developed laboratory method to examine associations of urinary LNCS and sugar excretion with obesity prevalence in Dutch children.
METHODS
This cross-sectional study included a random sample of 500 children aged 8-17 years from the Lifelines cohort. Urinary LNCS and sugars were measured from timed overnight urine using UPLC-MS/MS and summed for total concentrations. Body mass index (BMI) z-score and waist-to-height ratio (WHtR) z-score were derived from anthropometric measurements. Linear regression models assessed associations of urinary LNCS and sugars (expressed as mg/ml or log-transformed urinary biomarker-to-creatinine ratio [UBCR]) with obesity outcomes, adjusting for age, sex, screen time hours, and fruit and vegetable consumption frequency.
RESULTS
Among participants, 50% were female, 46% were aged 8-12 years, with a mean BMI z-score of 0.10 (SD: 1.0) and a mean WHtR z-score of 0.16 (SD: 1.0). Urinary saccharin was independently associated with BMI z-score (βmg/ml: 51.59 [95% CI: 7.96, 95.21]), and urinary sucralose with both BMI z-score (βmg/ml: 291.29 [95% CI: 98.01, 484.58]) and WHtR z-score (βmg/ml: 238.75 [95% CI: 44.53, 432.98]). Total urinary sugar (βLog-UBCR: -0.24 [95% CI: -0.37, -0.11]), fructose (βLog-UBCR: -0.15 [95% CI: -0.24, -0.061]), and glucose (βLog-UBCR: -0.29 [95% CI: -0.50, -0.083]) were inversely associated with BMI z-score. Inverse associations with WHtR z-score were also observed for total urinary sugar (βLog-UBCR: -0.18 [95% CI: -0.31, -0.041]), fructose (βLog-UBCR: -0.11 [95% CI: -0.21, -0.022]) and glucose (βmg/ml: -1.59 [95% CI: -3.15, -0.023]). No associations were found for total urinary LNCS, acesulfame, cyclamate, steviol, or sucrose with any outcomes.
CONCLUSIONS
Children with higher BMI z-score or WHtR z-score had higher urinary saccharin and sucralose concentrations but lower total urinary sugar, glucose, and fructose concentrations. These findings likely reflect differences in food and beverage consumption patterns among children and emphasize the value of biomarkers for more objective dietary assessment.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_145

UNDERSTANDING FOOD CHOICES IMPACT ON NUTRITIONAL STATUS IN BREEDE VALLEY MUNICIPALITY, SOUTH AFRICA

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BACKGROUND AND OBJECTIVES

Background

The consumption of unhealthy foods including excessive intake of ultra-processed foods are of public health concern and has grown globally in recent decades and rapidly in low-middle-income countries (Reardon et al., 2021). Consequently, it is linked to broader changes in the globalised food systems, resulting in an increase in non-communicable diseases (Waage et al., 2022). The study investigated the impact of food choices on nutritional status in Breede Valley district, South Africa.

Objectives

To determine the socio-demographic profile of households, food choices and assess the health risk.

METHODS

A descriptive cross-sectional study with a quantitative approach. Three-hundred and sixty-five households were systematically selected.

RESULTS

Over half of the participants were aged 36-55 years. Over a third of the households earned 1 000 to 3 000 ZAR. Dietary diversity revealed that staple foods were available in most households (88.8%), and in more than half of households, vegetables, meat and milk products and processed foods were available. Spices, condiments, beverages, cereals and other vegetables were the three most consumed food groups. Most households had a medium score of 8 to 11 food groups were 44.1%. The most common factor reported to influence food choices was food prices. More than half were obese ($\bar{x}$ = 35.15 kg/m2). The mean blood glucose was 6.34 ± 2.95 mmol/L and blood cholesterol was 5.39 ± 4.23 mmol/L. Monthly household income (r = 0.187, p = 0.002) was positively correlated with dietary diversity.

CONCLUSIONS

It is evident that financial considerations drive food choices. Consequently, making consumers to purchase foods that are cheaper and mostly non-nutritive.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_146

RELATIONSHIP BETWEEN PROTEIN AND AMINO ACID INTAKE AND MORTALITY RISK IN KOREAN ADULTS

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BACKGROUND AND OBJECTIVES
Recent studies have reported that protein quality, including food sources and amino acid (AA) composition, as well as protein quantity is associated with longevity and metabolic health. However, evidence regarding the relationship between protein, AA intake and mortality risk remains inconsistent. Thus, this study aimed to investigate the association between protein and AA intake and mortality risk among Korean adults.
METHODS
Based on 2007–2015 Korea National Health and Nutrition Examination Survey data linked with the Cause of Death data, 37,391 participants aged ≥30 years were included. Protein and AA intake was estimated using a 1-day 24-hour dietary recall linked with an expanded AA database. Associations between quintiles of protein and AA intake and mortality from all-causes, cardiovascular diseases (CVD), and cancer were analyzed using a Cox proportional hazard regression analysis and expressed as hazard ratios (HRs) and 95% confidence intervals (CIs) for mortality.
RESULTS
During a mean follow-up of 8.1 years, 1,921 deaths occurred. After adjusting for confounders, the participants in the highest quintile of plant protein (PP) intake had a lower risk of all-cause mortality compared to those in the lowest quintile (HR 0.96, 95% Cl 0.89-0.99, Ptrend = 0.027). Total protein intake was inversely associated with all-cause mortality in men (HRQ5 vs. Q1 0.93, 95% CI 0.87-0.99, Ptrend = 0.264). These inverse associations remained significant after additional adjustment of fat intake. After adjusting for confounders including fat intake, men in the highest quintile of essential and non-essential AA intakes had a lower risk of CVD mortality compared to those in the lowest quintiles (essential HR 0.56, 95% CI 0.32-0.97, Ptrend = 0.073, non-essential HR 0.55, 95% CI 0.33-0.93, Ptrend = 0.011). There was no significant association between cancer mortality and protein and AA intake.
CONCLUSIONS
Higher PP and AA intakes were associated with reduced risk of all-cause and CVD mortality in Korean adults. Further studies are needed to elucidate the role of dietary protein and AAs in longevity are required.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_147

THE INTERACTION BETWEEN CIRCADIAN TYPES AND ULTRA-PROCESSED FOOD (UPF) CONSUMPTION ON THE TYG (TRIGLYCERIDE-GLUCOSE) INDEX: A NEW PERSPECTIVE ON METABOLIC DISEASE PREVENTION

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BACKGROUND AND OBJECTIVES
Circadian types, classified as morning-type, intermediate-type, and evening-type, reflect variations in activity and physiological functions. While Ultra-Processed Food (UPF) consumption and circadian types are linked to metabolic diseases, their interaction with the triglyceride-glucose (TyG) index in Koreans remains understudied. This study explored the interaction between circadian types and UPF consumption with the TyG index.
METHODS
Data from 542 adults aged 20–69 years in the Gangwon Obesity and Metabolic Syndrome Cohort were analyzed. Circadian types were classified using rank-based clustering of Horne-Östberg questionnaire scores. Dietary data from a food frequency questionnaire were categorized using the NOVA classification. The TyG index was calculated as Ln [fasting glucose (mg/dL) × fasting triglycerides (mg/dL) / 2]. General linear models analyzed interactions, adjusting for age, sex, body mass index, education, smoking, physical activity, energy intake, dyslipidemia, and hypertension.
RESULTS
The morning-type group was older, had lower UPF consumption ($P = 0.001$), and showed significant differences in TyG index quartiles ($P = 0.005$) compared to the other groups. The TyG index was the highest in Q4 of UPF ($P = 0.046$). A significant interaction between circadian type and UPF consumption regarding the TyG index was observed in the evening-type group ($P = 0.043$). Diabetes risk was highest in Q4 of the TyG index (OR: 5.41, $P < 0.01$).
CONCLUSIONS
The interaction between evening-types and UPF consumption was significantly associated with the TyG index. These findings highlight tailored strategies considering circadian types and diets for metabolic disease prevention in Koreans.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_148

ASSOCIATION OF CHOLESTEROL LEVELS WITH LOW ENERGY AVAILABILITY AND EATING DISORDER SYMPTOMS IN ENDURANCE ATHLETES

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BACKGROUND AND OBJECTIVES
Problematic low energy availability (LEA) occurs when an athlete's energy intake chronically fails to meet the energy demands of physical activity and basic physiology leading to disturbances in different physiological systems (1). This condition is prevalent among active and athletic populations (2) and can arise from disordered eating (DE) or unintentional behavior (3). Both problematic LEA and DE can lead to disturbances in cholesterol metabolism (4), which may elevate the risk of future cardiovascular diseases. Our study explored the relationship between LEA, DE symptoms, and cholesterol levels in Finnish endurance athletes across different phases of the athletic year.
METHODS
Endurance athletes (male n=31, female n=24) were assessed twice during an athletic year: at the beginning of their training season and at the start of their competition season. The Relative Energy Deficiency in Sport Clinical Assessment Tool, version 2 (REDsCAT2 (5)) was used to evaluate their risk of LEA. REDsCAT2 categorizes athletes into risk groups based on markers of LEA, including free triiodothyronine (T3), menstrual status (female), testosterone (male), bone mineral density, history of bone stress injuries, and DE behavior (Eating Disorder Examination Questionnaire Short [EDE-QS]). Serum cholesterol concentrations were measured from venous blood samples. Low-density lipoprotein (LDL) cholesterol is part of the REDsCAT2 but was excluded from the LEA assessment in the present study, because it was the outcome variable of interest. Multilevel model, Pearson's r, and linear regression were used to analyze the relationships between the variables.
RESULTS
Overall, most athletes were classified as being at risk of LEA. Of the female athletes, 75% were classified as being at risk of LEA in the training season and 67% in the competition season (p=0.18 for difference between seasons), and of the male athletes, 71% and 84%, respectively (p=0.63 for difference between seasons). We found no associations of LEA risk or symptoms of DE behavior with cholesterol levels during any season. In female athletes, an increase in LEA risk between seasons was associated with a decrease in LDL cholesterol (beta adjusted for age -0.40, 95% CI -0.66–(-0.14), p=0.0044).
CONCLUSIONS
Contrary to expectations, we found no association between LEA risk scores or DE behavior and LDL levels. Also, an increase in LEA risk was associated with a decrease rather than an increase in LDL cholesterol levels in female athletes. Further research is needed to evaluate whether elevated LDL cholesterol should remain part of the LEA risk assessment criteria.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_149

SOCIOCULTURAL INFLUENCES ON EATING PRACTICES AMONG ADOLESCENTS (15 TO 17 YEARS OLD): A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES
Food and eating practices are strongly related to the increasing prevalence of obesity and non-communicable diseases, affecting the world´s population, including adolescents. Since eating is a modifiable risk factor, it is crucial to understand its main determinants and how changes can be made. Adolescence is an important transition phase as adolescents strive to become increasingly independent and make their own choices. During this phase, new habits are adopted, and they are also highly vulnerable to social influence. Sociocultural factors account for relevant influences on diet and eating practices, with major health impacts, especially concerning adolescents. However, there is a lack of knowledge regarding those factors and how they shape eating practices. The aim of this scoping review is to map information concerning sociocultural factors that shape adolescents' eating practices from primary studies in four scientific databases - PubMed, Lilacs/Scielo, PsycINFO, and Scopus. Sociocultural factors considered in this review correspond to values, beliefs, social rules, and social life dynamics, such as daily work or study routine, identity buildup, and group belonging. The targeted adolescent population in this review is 15 to 17 years old.
METHODS
This scoping review was conducted according to a protocol previously registered in the Open Science Framework. It was mainly developed following the Joanna Briggs Institute (JBI) guidance for conducting scoping reviews. It sought to answer the question, "Which sociocultural factors affect adolescents' eating practices, and how do those factors shape their eating practices?" A total of 17 articles were included for data extraction and analysis.
RESULTS
The qualitative method prevailed in the included studies. The most commonly studied eating practice is food choice. As for sociocultural factors, the most prevalent values are taste preference for non-healthy food and body image. Family, school, peers, and social media are the leading influencers. A singular finding refers to the belief that "only small children take food from home to school," indicating that issues about the passage from adolescence to adulthood affect eating behavior. Lack of time due to the busy routines of parents or adolescents leads to the consumption of quick and easy food and breakfast skipping.
CONCLUSIONS
Adolescents enjoy increasing independence and favor food taste and body image, but they are usually unhealthy when dealing with food choices. In order to bring about healthy changes to adolescents' eating practices, sociocultural factors should be carefully considered in public policies for this population.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_150

ADHERENCE TO HEALTH BEHAVIOR RECOMMENDATIONS AND CHILDHOOD WEIGHT: A LONGITUDINAL STUDY

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BACKGROUND AND OBJECTIVES
Many studies have shown the beneficial effect of healthy lifestyles on weight outcomes. However, less is studied whether adherence of health behavior recommendations can predict weight outcomes over a long follow-up period during childhood. The aim of this study was to investigate whether adherence to 4 health behavior recommendations in early childhood predicts BMI z-score 7 years later.
METHODS
The baseline study sample consists of 864 Finnish preschoolers, aged 3-6, participating in the DAGIS study in 2015-2016. Data on physical activity (PA), sleep duration, screen time, and dietary intake were collected using actigraphy, screen time logbooks, and 3-day food records. Anthropometrics were measured by research staff. Adherence to recommendations was defined as 1) less than 1 h of screen time per day, 2) at least 3 h of PA per day, including at least 1 hour of moderate-to-vigorous PA, 3) 10–13 hours of sleep per night, and 4) consuming at least 250 g of fruits and vegetables per day. Follow-up data (n=210) on parent-reported anthropometrics was collected in 2023 when participants were 10–14 years. Linear regression analyses were conducted to predict follow-up BMI z-score with adherence to health behavior recommendations at baseline, controlling for age, gender, baseline BMI z-score, and duration of follow-up.
RESULTS
Adherence to the chosen recommendations varied between 35% to 53%, while only 4% adhered to all of them. The RESULTS indicated no significant associations; neither the total number of adhered recommendations nor adherence of individual recommendations were predictive of follow-up BMI z-score.
CONCLUSIONS
Despite the established positive health effects of following health behavior recommendations, we found no evidence that adherence to these recommendations during preschool years influences weight outcomes in later childhood. However, the non-significant findings may be attributable to the small sample size or selection bias.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_151

Association between breastfeeding indicators and infant development quotient: RESULTS from the Brazilian National Survey on Child Nutrition (ENANI-2019)

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BACKGROUND AND OBJECTIVES
The relationship between how breastfeeding can affect early childhood development (ECD) is not fully understood. This study investigated the association between breastfeeding practices and ECD in Brazilian children.
METHODS
Data were collected from 5,766 children aged 1-23 months as part of the Brazilian National Survey on Child Nutrition (ENANI-2019). Breastfeeding indicators followed WHO guidelines: for infants aged 1-5 months: 1) exclusive breastfeeding (EBF); 2) predominant breastfeeding; 3) mixed breastfeeding; 4) complementary feeding; and 5) no breastfeeding; and for children aged 6-23 months: breastmilk consumption (yes/no) and baby bottle use (yes/no). ECD was assessed using the Brazilian version of the Survey of Well-being of Young Children (SWYC-BR). Developmental age was estimated through graded response models, and the developmental quotient (DQ) was calculated as developmental age divided by chronological age, with DQ=1 indicating that a milestone was achieved. Multiple linear regression models examined the association between breastfeeding and DQ. Directed Acyclic Graphs determined the minimum set of adjustments needed.
RESULTS
The prevalence of breastmilk consumption did not differ according to any selected variables. However, a lower prevalence was observed among those who used a baby bottle (41.1% [37.6; 44.5]) compared to those who did not (83.2% [79.8; 86.6]). The prevalence EBF was also lower among those who used a baby bottle (2.1 [0.4; 3.8]) compared to those that did not use (60.0 [53.8; 66.1]). The mean DQ was higher for EBF infants aged 1-5 months (1.94; 95%CI 1.72-2.16) compared to those on complementary feeding (1.56 [1.46-1.67]). Among children aged 1-23 months, higher DQ scores were observed in those receiving breastmilk (yes: 1.29 [1.24;1.34] vs. no: 0.99 [0.97-1.00]) and in those not using a baby bottle (no: 1.38 [1.31;1.45] vs. yes: 1.21 [1.17-1.25]). Multivariate analysis confirmed that for infants aged 1-5 months, EBF was directly associated to DQ (β= 0.295; 95% CI: 0.087-0.503; p=0.006). For 1-23 months, breastmilk intake (β= 0.193; 95% CI: 0.135-0.251; p<0.001) and avoiding baby bottles (β= 0.164; 95% CI: 0.092-0.236; p<0.001) were also directly associated with DQ.
CONCLUSIONS
WHO-recommended breastfeeding practices, such as EBF, continued breastfeeding, and avoiding baby bottles, are directly associated with DQ.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_152

HEALTH SCORE: UNVEILING LIFESTYLE INSIGHTS FROM HEALTH APP USERS

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BACKGROUND AND OBJECTIVES
Presenting a health score to users is a patient engagement strategy. Apps that aim to promote health can follow different methodologies. Lifestyle Medicine is an interdisciplinary approach, based on scientific evidence, which is grounded on pillars of health care. Objetive: Describe the RESULTS of a lifestyle questionnaire answered using a chatbot in a health app.
METHODS
The survey is based on lifestyle medicine and is subdivided into five pillars: general habits, nutrition, movement, sleep and balance. Each pillar is derived from a more extensive and already validated instrument that measures the same construct. The final result is a score referring to the adequacy of self-care, ranging from 0 to 100 points. A validation study of this methodology was carried out and showed that the measure is comparable to the original instruments. Analyses aim to describe users' health behavior.
RESULTS
72,137 people responded to the questionnaire from January 2024 until mid-September. Of the people who added gender and age data, the public was mostly women (79.8%) aged 25-29 (22.4%). The most challenging pillar was nutrition, with only 23% of users reporting that they ate fruit, 27% vegetables, 36% legumes and only 3% nuts and seeds on a daily basis. In the mental health pillar (i.e. Balance), women had a lower average score (M = 61.14; SD = 15.66) than men (M = 66.05; SD = 14.99). Movement showed the best central tendency indices (M = 67; SD = 40; Med = 100), but women had a lower average score (M = 69; SD = 39) than men (M = 76; SD = 36). Data obtained on diet reflects a previously described Brazilian dietary pattern, where in recent years there has been a decrease in the consumption of fresh and minimally processed foods. There were also difficulties in caring for mental health and lower indicators of physical activity among women, which is also observed in epidemiological data
CONCLUSIONS
The RESULTS obtained from filling in a validated questionnaire via chatbot showed that the average health score was 61.3. This data is essential for creating health engagement strategies.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_153

ENHANCING LARGE-SCALE FOOD FORTIFICATION PROGRAMS: INSIGHTS FROM A DECADE OF MARKET ASSESSMENTS ON PRODUCT FORTIFICATION QUALITY, AVAILABILITY, AND MARKET SHARE

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BACKGROUND AND OBJECTIVES
Large-scale food fortification (LSFF) programs aim to improve public health by increasing micronutrient intakes, but their effectiveness relies on accurate and actionable data for programmatic decision making. To support this, the Global Alliance for Improved Nutrition developed a market assessment methodology in 2015 to assess product fortification quality, availability, and market share. Between 2015 and 2024, 24 assessments were conducted across 12 countries and nine food vehicles. We reviewed the strengths and limitations of these market assessments with the aim to make recommendations on good practices to take forward.
METHODS
We summarized the commonalities and implementation evolution in terms of the objectives, methodologies, and RESULTS obtained across the 24 market assessments.
RESULTS
All market assessments maintained the same objectives, putting the product central to combine product characteristics (including origin, fortification labelling and fortification status and meeting fortification standards) with product availability and market share. Assessments included edible oil (21), wheat flour (19), salt (17), maize flour (12), sugar (6), milk (4), margarine (4), rice (4), and bouillon cubes (1). Methods to extrapolate to the market share evolved from using secondary data to inclusion of the retail penetration. Assessment RESULTS identify two key indicator groups for decision makers: (A) product count and proportions and (B) market share by product characteristics. Apparent discrepancies exist in proportions reported between these key groups of indicators. E.g., in Tamil Nadu, India (2023), 56% of 117 oil products were labelled as fortified, of which 62% were analyzed, of which 88% were fortified, and of which 29% met fortifications standards. However, in market share 91% were labelled as fortified, of which 87% were analyzed, of which 97% were fortified, and of which 19% met fortifications standards. In general, market share was higher than the proportion of products, showing that dominant products were more likely to be fortified.
CONCLUSIONS
The review highlights the value of market assessments for LSFF design and performance monitoring. Key indicators serve different roles: product proportion primarily informs regulators, while market share helps public health actors assess food and micronutrient delivery to the population. Indicators are best presented in a cascade, with the denominators adjusted at each level to enhance interpretation and pinpoint key gaps.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_154

EVALUATING A FOOD SAFETY AND WATER, SANITATION AND HYGIENE (WASH) CURRICULUM TARGETING LOW-LITERATE FISHERS/PROCESSORS IN ZAMBIA TO INFORM TWO PUBLIC HEALTH- AND NUTRITION-ORIENTED OPEN-ACCESS COURSES

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BACKGROUND AND OBJECTIVES

Reduced nutrition, food waste, and foodborne illness that are linked to inadequate cold chains and unsanitary practices during fish processing are serious public health threats in low- and middle-income countries (LMIC) throughout sub-Saharan Africa where the poor rely on fish as an affordable/accessible animal source food (ASF). Such is the case in Zambia, where >50% of the population can afford only 1-2 meals per day and the most commonly consumed ASF is locally sourced fish [1]. As fish is highly perishable without proper cold chains, most fish are processed at point-of-catch using traditional methods (e.g., smoking, sun-drying), and low-literate women predominate in this economic activity. As most fish processors lack adequate training in food safety and water, sanitation and hygiene (WASH), traditional processing methods can expose fish/fish-products to biological and environmental contaminants that reduce nutrition, increase spoilage, and/or generate foodborne illness.

METHODS

To help address these critical knowledge gaps among low-literate processors in rural Zambia, we implemented a three-hour curriculum on fish processing, food safety and WASH tailored for low-literate fishers and processors in Siavonga (N=53; n=33 women). We discuss how this curriculum built directly upon successful implementation activities among low-literate fishers and processors during two separate USAID Feed the Future Fish Innovation Lab projects, *FishFirst! Zambia* (2020-2023) and *Nourishing Nations–Nigeria* (2020-2023) [2-4]. We review the ComFA+Fish Fish Processing/WASH Training modules, which focus on enhancing knowledge of safe fish processing, storage, and WASH to improve food safety, increase the quality of fish/fish-products, reduce spoilage/post-harvest loss, and reduce pressure on fisheries.

RESULTS

We present the pre-test/post-test evaluation RESULTS and how they are being used to directly inform the content of two self-paced open-access online courses we are developing for dissemination via mobile phones to global audiences.

CONCLUSIONS

The first open-access course focuses on fish for human nutrition, early infant feeding, and WASH, and targets caregivers, nurses, nutritionists, extensionists, and community health workers. The second open-access course focuses on fish processing, food safety, and WASH and targets fishers, processors, nurses, nutritionists, extensionists, and community health workers.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_155

PERCEPTION OF MULTIPLE MICRONUTRIENT SUPPLEMENTATION (MMS) AND IRON-FOLIC ACID (IFA) SUPPLEMENTS AMONG PREGNANT AND POSTPARTUM WOMEN: A STUDY IN, INDONESIA

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BACKGROUND AND OBJECTIVES
Multiple Micronutrient Supplementation (MMS) has been officially recognized by the World Health Organization (WHO) as an essential supplement for pregnant women, aimed at addressing micronutrient deficiencies that can impact the health of both the mother and the fetus. The acceptance of MMS has been implemented in various regions. In Indonesia, MMS has begun to be distributed in several districts as part of the maternal and child health program. This study aims to assess the perceptions of MMS and iron-folic acid supplements (IFA) among pregnant women and postpartum women in Indonesia
METHODS
The cross-sectional study was conducted in Takalar District from March to October 2022, utilizing a two-stage cluster sampling technique. For this analysis, we included only pregnant women (144) and postpartum women (77) who received either MMS or iron-folic acid supplements (IFA) exclusively. Data were collected using a validated questionnaire administered by trained enumerators
RESULTS
Five domains of perception were analyzed, including affective attitude, perceived burden, perceived effectiveness, cost likelihood, and self-efficacy in consumption. Among pregnant women, the affective attitude domain showed a significant difference between MMS and IFA (P<0,05); however, for postpartum women, no significant difference was found. For the other domains, no significant differences were observed between the group receiving only MMS and the group receiving only IFA
CONCLUSIONS
These RESULTS indicate that the acceptance of MMS as a new supplement is similar to that of IFA. Despite the distribution of MMS without specific education or socialization efforts for healthcare providers and pregnant women, it was well accepted. The findings suggest that MMS can be effectively integrated into maternal health programs, as there were no significant differences in most perception domains between the MMS and IFA groups. This highlights the potential for MMS to be successfully adopted without substantial barriers, though further educational initiatives could improve its acceptance and understanding.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_156

AN AB LIBITUM MEDITERRANEAN DIET INTERVENTION FOR WOMEN WITH PCOS: A MIXED METHODS EXPLORATION OF ACCEPTABILITY, ADHERENCE AND LIVED EXPERIENCE

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BACKGROUND AND OBJECTIVES
A healthy lifestyle, including diet, is crucial for managing polycystic ovary syndrome (PCOS), yet optimal dietary recommendations remain unclear. Alternative dietary interventions are needed to meet the unique needs of women with PCOS. While the Mediterranean diet (MedDiet) is known to support cardiometabolic health and weight management, little is known about adherence challenges in this population. Therefore, this study explores the acceptability and lived experiences of an ad libitum MedDiet intervention in women with PCOS and provides theory-informed recommendations for dietary implementation.
METHODS
A 12-week MedDiet intervention was conducted with women aged 18–45 years, diagnosed with PCOS and a BMI ≥25 kg/m² (n=12). Adherence was assessed using the Mediterranean Diet Adherence Screener. Surveys and semi-structured interviews, guided by the Capability, Opportunity, Motivation-Behaviour (COM-B) model, explored participants' experiences. Thematic analysis identified barriers and facilitators, which were mapped to the COM-B model and Theoretical Domains Framework (TDF). All findings were subsequently mapped against the Behaviour Change Wheel to guide implementation strategies.
RESULTS
MedDiet adherence significantly improved from baseline to week 12 (4.1±1.85 to 8.3±2.31; P=0.001). Participants reported significant improvements in MedDiet knowledge (Z= -2.88, P=0.004), cooking confidence (Z= -2.55, P=0.01), and time management (Z= -2.59, P=0.01). Adherence factors were identified across the COM-B domains and mapped to 12 TDF domains. Key facilitators included perceived health benefits, reduced weight-related pressure, educational resources, and the simplicity of guidelines. Barriers included challenges related to organization, food availability, external influences, and stress. Effective dietary implementation should incorporate MedDiet education, behavior change support, practical resources and cooking classes. Additional strategies include professional training for dietitians to support MedDiet prescription, and education for healthcare professionals to encourage and support referral pathways to trained nutrition professionals, and to support weight-neutral approaches for PCOS dietary management.
CONCLUSIONS
This study demonstrates the short-term acceptability of an ad libitum MedDiet for women with PCOS. Over 12 weeks, participants significantly improved their adherence, knowledge, and confidence. Ongoing education and training on the MedDiet for patients and healthcare providers should be prioritised to support dietary adherence and acceptability.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_157

DETECTION OF DIETARY PLANT MICRORNAS IN HUMAN BREAST MILK AND POTENTIAL IMPLICATIONS FOR INFANT DEVELOPMENT: INSIGHTS FROM THE BULGARIAN POPULATION

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BACKGROUND AND OBJECTIVES
Plant-derived microRNAs (miRNAs) found in human breast milk have gained attention in nutritional biology due to their potential roles in infant development. These small RNA molecules regulate gene expression and influence various biological pathways. This study investigates the presence, dietary origins, and biological implications of plant-derived miRNAs in breast milk, with a focus on their relationship to maternal diet and infant health outcomes.
METHODS
A comprehensive literature review was performed to integrate findings on the stability, dietary sources, and functional roles of plant miRNAs in human milk. Key studies analysing milk miRNA profiles and their associations with maternal dietary patterns and bioactive molecules were examined. Additionally, primary data were collected from 22 clinically healthy breastfeeding mothers in Bulgaria. Participants provided informed consent, completed socio-demographic surveys, and underwent dietary assessments via a food frequency questionnaire (FFQ). Breast milk samples were collected during two lactation periods (2–4 weeks and 12–16 weeks postpartum). Analysis focused on specific plant miRNAs, including miR166a, miR156a, miR157a, miR172a, and miR168a, using next-generation sequencing (NGS) followed by bioinformatics analysis.
RESULTS
This study is the first of its kind in Bulgaria, uniquely aiming to explore the relationship between maternal diet, plant-derived microRNAs (miRNAs) in breast milk, and their impact on infant development and microbiome composition. Maternal dietary patterns, may significantly influence the expression of specific miRNAs, potentially modulating the milk's bioactive profile. These miRNAs, in synergy with molecules like leptin and adiponectin, could play a pivotal role in supporting metabolic adaptation and brain development in infants, as well as influencing their microbiome. However, the lack of localized data highlights the importance of this pioneering research in the Bulgarian context
CONCLUSIONS
The identification of plant-derived miRNAs in human breast milk highlights a novel and emerging area in nutritional biology with potential implications for infant development and metabolic regulation. Understanding the dynamic interplay between maternal diet, breast milk composition, and infant health could inform tailored dietary recommendations for lactating mothers and support future nutritional interventions. Further research is vital to uncover the mechanisms behind these associations and their impact on infant well-being.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_158

Macro- and micronutrients according to the energy share of ultra-processed foods among Brazilian children 6-59 months old: RESULTS from the Brazilian National Survey on Child Nutrition (ENANI-2019)

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BACKGROUND AND OBJECTIVES

The consumption of ultra-processed foods (UPF) is increasing, especially for children. The objective is to describe the intake of macro- and micronutrients of Brazilian children 6-59 mo old according to energy participation of UPF in the diet.

METHODS

We used data from ENANI-2019, a household survey with a complex probabilistic sample. A single 24-hour dietary recall, using the multiple-pass method, was administered in 14,505 Brazilian children. Food composition analysis used the Brazilian Food Composition Table (v. 7.2). Nutrient estimates for culinary preparations were based on ingredient-level breakdowns using standard recipes, and, for some food products, the manufacturer's 2020 nutritional information was used. Foods and ingredients were classified according to Nova's classification. The relative energy participation of food groups was estimated, considering the total energy consumed. The mean and 95% CI of energy share from UPF subgroups were described by age group (6-23 and 24-59 mo). Linear regression models, with each nutrient intake per 1,000 kcal as an outcome, were adjusted for income to verify the change in nutrient consumption per quintile of energy participation of UPF in the diet. β coefficients and p-values were estimated. R programming language was used.

RESULTS

The most consumed UPF subgroups were infant cereal flours (energy participation: 6.7%, 95%CI 6.0; 7.5), sweet cookies (3.4%, 95%CI 3.0; 3.8), and infant formulas (2.9%, 95%CI 2.1; 3.7), for 6–23 mo; and sweet cookies (6.0%, 95%CI 5.4; 6.7), chocolates, ice cream and other industrialized desserts (5.2%, 95%CI 4.8; 5.7) and dairy drinks (3.3%, 95%CI 3.0; 3.6), for 24–59 mo. In 6–23 mo, a significant negative consumption was observed with increasing quintiles of UPF for fat, potassium, and vitamin A RAE [β: -3.1; -52.0; -112.3, respectively]. Furthermore, a significant positive consumption for total energy (β: 73.69), carbohydrates (β:7.4), calcium (β: 78.8), iron (β: 2.9), phosphorus (β: 39.0), vitamin A RE (β: 108.4), vitamin C (β: 9.0) and folate (β: 16.0) was found. In 24–59 mo, a significant negative consumption was observed the greater of UPF, while the increase in energy and carbohydrate consumption was maintained (β: 92.97 and 2.4).

CONCLUSIONS

Among children aged 6–23 mo, there was an increase in the consumption of calcium, iron, phosphorus, vitamin A RE, vitamin C, and folate, as well as energy and carbohydrates, according to UPF increase. For 24-59 mo, there was a decrease in most micronutrients and an increase in total energy and carbohydrates.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_159

DETERMINANTS OF CHRONONUTRITION PATTERNS IN FINNISH PRESCHOOLERS: THE ROLE OF CHRONOTYPE, PARENTAL WORK HOURS, AND SOCIOECONOMIC STATUS

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BACKGROUND AND OBJECTIVES
Early childhood is crucial for establishing lifelong eating patterns. Chrononutrition, which encompasses the timing and regularity of food intake, impacts metabolic health and the risk of chronic diseases. This study aimed to investigate the associations between chronotype, parental work hours, and socioeconomic status (SES) with the timing of food intake among Finnish preschoolers.
METHODS
677 children aged 3 to 6 years from the DAGIS survey participated in this cross-sectional study. Data were collected through 3-day food records and 7-day actigraphy-based sleep measurements. The chrononutrition variables examined included morning latency (the interval between waking and the first eating occasion), evening latency (the duration from the last eating occasion to sleep onset), fasting window (the period between the last meal of one day and the first meal the following day), and energy midpoint (the clock time at which 50% of daily caloric intake is consumed). To examine associations between the determinants and chrononutrition variables, analysis of variance (ANOVA) and covariance (ANCOVA), along with univariate and multivariate linear regression, were conducted for overall mean values and separately for weekdays and weekends.
RESULTS
Children with a morning chronotype exhibited longer morning latency (79 minutes vs. 52 minutes) and shorter evening latency (61 minutes vs. 108 minutes) compared to children with an evening chronotype ($p < 0.001$). The timing of the energy midpoint was earlier for children with a morning chronotype (13:25) than for those with an evening chronotype (14:11) ($p < 0.001$). Children from lower SES backgrounds reached their energy midpoint earlier (13:45) than those from higher SES backgrounds (13:57) ($p < 0.001$). On weekdays, children whose mothers worked regular hours had a shorter fasting window of 11 hours and 45 minutes compared to those whose mothers worked shifts (12 hours and 15 minutes) ($p = 0.009$). On weekends, children of fathers with regular work hours exhibited longer morning latency, averaging 1 hour and 41 minutes compared to 1 hour and 15 minutes for those with unemployed fathers ($p = 0.04$).
CONCLUSIONS
This study found chronotype, parental work hours, and SES to be associated with the timing of eating in Finnish preschool-aged children. Parental influence varies between weekdays and weekends, highlighting the need for tailored parenting strategies and supportive policies to promote healthier eating habits aligned with children's biological rhythms.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_163

RECOGNITION OF A “HEALTHY DIET” AMONG YOUNG WOMEN

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BACKGROUND AND OBJECTIVES
According to the World Health Organization, eating a variety of foods, combined with reduced salt and sugar intake, is essential for a “healthy diet”. Although a “healthy diet” consists of a combination of different foods, for many people, the exact definition remains unclear. Therefore, the aims of the present study were to clarify the definition of a “healthy diet” and identify associated problems for young women**.**
METHODS
We conducted a questionnaire survey on young women. The questionnaire included pictures of 91 kinds of food selected from common dishes for younger people. The respondents were asked to choose dishes for dinner that they considered to be “healthy eating”. In addition to the survey responses, we asked which points were important when choosing the food items. Based on the responses, the respondents were classified into two groups: chooser and non-chooser. Finally, we conducted a comparative review regarding the intake of vegetables and nutrients for each group.
RESULTS
A total of 236 young women (age range, 17–22 years) responded to the survey. The nutritional contents of the respondents’ selected dinner items were as follows: energy, 776±189 kcal; protein, 31.4±8.5 g; calcium, 200±95 mg; iron, 3.2±1.1 mg; sodium chloride equivalent, 4.4±1.1 g; vegetable intake, 157±69 g; and fat energy ratio, 34%. Regarding the important points when choosing food items, more than half of the respondents selected “vegetable intake” (choosers); these women consumed significantly more vegetables than the non-choosers ($p<0.001$).
CONCLUSIONS
The RESULTS of the present study suggest that young women recognize the importance of “eating more than 350 g of vegetables every day”. However, the findings also revealed problems in terms of excess (fat and sodium chloride equivalent) or deficient (iron and calcium) nutrient intake. Therefore, a clearer definition and better recognition of what constitutes a “healthy diet” are needed.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_167

PREVALENCE OF IRON DEFICIENCY AND ASSOCIATED RISK FACTORS IN MONGOLIAN CHILDREN AGED 6-59 MONTHS: FINDINGS FROM MONGOLIA'S VI NATIONAL NUTRITION SURVEY, 2023

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BACKGROUND AND OBJECTIVES
Iron is vital for physical and cognitive development, and its deficiency is a leading cause of anemia, characterized by low red blood cell levels and reduced oxygen-carrying capacity (1). This study aimed to determine the prevalence of iron deficiency among Mongolian children aged 6-59 months, as well as the risk factors associated with the prevalance.
METHODS
This cross-sectional study was part of the Sixth National Nutrition Survey conducted across all 21 provinces and 8 districts of Ulaanbaatar, Mongolia, in 2023. The cluster sampling method was used and random sampling unit was household with 5 years-old child. Serum Ferritin (SF) levels below 12 µg/L and soluble transferrin receptor (sTfR) levels above 8.3 mg/L were used as a biomarker for iron deficiency. A national representive of 1,271 children aged 6-59 months participated the blood test to determine iron defiecency. Logistic regression (univariate and multivariable) and descriptive statistics were used for data analysis.
RESULTS
The adjusted mean serum ferritin and soluble transferrin receptor levels were 42.6 µg/L and 6.2 mg/L, respectively. The prevalence of iron deficiency was 14.1% (SF) and 10.8% (sTfR), both lower than global estimates but comparable to Asia-Pacific countries (2,3). Children aged 6–23 months were at higher risk of iron deficiency by SF (AOR 3.769) and sTfR (AOR 4.123). Male children (SF: AOR 1.774; sTfR: AOR 1.511), those with mothers with primary or no education (SF: AOR 1.941; sTfR: AOR 2.355), and Kazakh ethnic children (SF: AOR 4.248; sTfR: AOR 4.995) were also more likely to be iron-deficient.
CONCLUSIONS
Iron related nutrition interventions targeting children aged 6-23 months old is needed to be implemented in Mongolia. Strengthening the capacity of health workers to provide nutrition-related advice and implementing culturally appropriate education programs for mothers and families are critical. Further research and tailored interventions are required to address the higher prevalence of iron deficiency in the Kazakh ethnic population.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_169

CHIA SEEDS FED TO OBESE PREGNANT RAT INCREASE DHA AVAILABILITY IN MATERNAL LIVER, PLACENTA AND BRAIN OF OFFSPRING

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BACKGROUND AND OBJECTIVES
Maternal obesity increases obstetric complications and affects fetal growth leading to a higher risk of developing mental and cardiometabolic disorders later in life (DOHAD concept). Alterations in fetal developmental programming may be due in part to deficiencies in the delivery of n-3 long-chain polyunsaturated fatty acids (n-3 LCPUFA) to the fetus, resulting to an imbalanced n-6/n-3 LCPUFA ratio. Alpha-linolenic acid (ALA), an essential fatty acid, is a precursor of docosahexaenoic acid (DHA, n-3LCPUFA), which is thought to play a critical role in fetal brain development. There is growing evidences that ALA supplementation early in pregnancy reduces obstetric complications and improves birth weight. However, according to the ELFE study, more than 75% of women consume less than the recommended 2g/d of ALA during pregnancy (ANSES, 2017). Chia seeds are an important source of ALA, with 64% of ALA in the lipid fraction and may be a good plant source for reducing n-3 LCPUFA deficiencies. In an obese rat model, we investigated the effect of chia seed supplementation during pregnancy on the maternal liver's capacity to produce DHA and transfer it across the placenta to the fetal brain.
METHODS
Female pregnant rats were fed a high fat high sugar (HFHS) diet or HFHS+chia seeds (4g/kg/d) during pregnancy and the RESULTS of lipid metabolism in maternal liver, placenta and fetal brain were measured at gestation day G15 and G20, at metabolite level by LC-MS/MS, at gene level by RT-qPCR and at protein level by WB. Significant differences were assessed by multiple t-test, Mann-Whitney or Kruskal-Wallis test with p-value < 0.05.
RESULTS
Chia seed supplementation during pregnancy significantly increased ALA, eicosapentaenoic acid (EPA) and DHA levels and gene expression of ELOVL5 and FADS1/2 in rat liver, at G15 and G20, in HFHS+chia compared to HFHS group. Increased incorporation of DHA into TG and phosphatidylcholines (PC) was observed in liver and maternal circulation, while n-6 LCPUFA were decreased. In addition, DHA accumulation in PC was observed in placenta and fetal brain at G15 and G20 of pregnancy.
CONCLUSIONS
Our RESULTS show that chia seeds fed to obese rats during pregnancy **1)** increase the conversion of ALA to DHA which, in turn is incorporated into the *de novo* synthesis of complex lipids, i.e. TG and phospholipids; **2)** increase DHA-containing lipids in the maternal circulation, in placenta and fetal brain, suggesting an increased capacity for transfer of n-3 LCPUFA across the placental and brain barriers in obese rat.
CONFLICTS OF INTERESTS
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EPO5_170

DIETARY PATTERNS AND NUTRITIONAL DETERMINANTS OF HEALTHY AGEING AMONG COMMUNITY-DWELLING OLDER ADULTS

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BACKGROUND AND OBJECTIVES
Population ageing, a global trend driven by advancements in public health and development, presents challenges like ensuring healthy lives, social protection, and active participation of older adults. This study explored dietary patterns and examined the relationship between nutritional determinants and healthy ageing, offering insights to enhance sustainable health and well-being.
METHODS
The study employed a concurrent mixed-methods design targeting individuals aged 60 years or older from five districts with strong elderly networks and the highest proportions of individuals aged 90 years or older. Data were collected using demographic questionnaires, a semi-food frequency questionnaire, and in-depth interviews, and analyzed using regression to determine odds ratios (OR) and adjusted odds ratios (AOR), with significance at $p < 0.05$.
RESULTS
The study involved 265 participants with an average age of 70.4 years, of whom 72.1% were female and 27.9% male. Among the participants, 95.3% exhibited healthy ageing characteristics. Majority of them lived with family members (79.6%), had primary education (63.2%), and sufficient income (63.9%). Regarding nutritional status, 41.2% were classified as obese, with an average body mass index of 23.98 kg/m² (SD = 5.25). Several factors were significantly associated with healthy ageing, including the absence of hypertension (OR = 15.12; P = 0.03), asthma (OR = 73.08; P < 0.01), musculoskeletal diseases (OR = 9.31; P = 0.01), and community engagement (OR = 13.24; P = 0.03), with community engagement remaining significant after adjustment (AOR = 14.43; 95% CI: 1.91–109.21, P = 0.01). Additionally, 41.7% of participants with healthy ageing demonstrated higher scores for good dietary behaviors, which were strongly associated with greater nutrition knowledge (AOR = 1.50, P = 0.03), positive attitudes (AOR = 3.37, P < 0.01), and food security (AOR = 2.42, P < 0.01). The qualitative findings revealed that older adults with healthy ageing traits prepared their own meals, and grew vegetables at home, and followed a balanced diet emphasizing rice (white and brown), local vegetables, low-sugar fruits, fish (≥3 times weekly), and whole eggs (1–3 times weekly), while avoiding processed foods and alcohol.
CONCLUSIONS
This study underscores the importance of national nutrition policies in preventing chronic diseases, enhancing food security, and promoting balanced diets aligned with food-based dietary guidelines. Community engagement significantly contributes, emphasizing the need for integrated approaches to achieve sustainable health among older adults.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_174

DISABILITY-INCLUSIVE NUTRITION AND FEEDING SUPPORT FOR SMALL AND NUTRITIONALLY AT-RISK INFANTS UNDER SIX MONTHS AND THEIR MOTHERS: A CASE STUDY FROM SOMALILAND

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BACKGROUND AND OBJECTIVES
Nearly half of child deaths result from undernutrition, with infants under six months [u6m] and children with disabilities particularly at risk. The management of small and nutritionally at-risk infants u6m and their mothers [MAMI] Care Pathway guides this care, and has been implemented in various low- and middle-income countries. However, gaps remain in making these services disability-inclusive and ensuring appropriate support for infants and mothers with disabilities. This case study from Somaliland highlights lessons learned and key recommendations from a training pilot with frontline healthcare workers in disability-inclusive MAMI, advocating for the broader dissemination of the training package to similar programs.
METHODS
A four-day disability-inclusive MAMI training was created and piloted with 17 frontline healthcare workers in Hargeisa, Somaliland. The interactive sessions focused on core competencies, including understanding disability inclusion, communicating with mothers with disabilities, identifying and managing feeding difficulties in infants with disabilities, and integrating inclusive practices into services for infants u6m and their mothers. Participants' feedback included pre/post tests, an evaluation, and a final discussion.
RESULTS
The training received a 4.9/5 satisfaction score indicating adequate transfer of knowledge, with participants improving test scores by an average of 50% (range 12%-160%). Frontline healthcare workers valued improving their knowledge and skills to deliver appropriate nutrition and feeding care and support for infants and mothers with disabilities. Feedback included the need for more training, hands-on practice, on-the-job mentorship, the integration of localized feeding videos for infants and mothers with disabilities in the training, promoting the biopsychosocial model of disability, integration of disability inclusion into nutrition and health programs, and strengthening disability inclusion policies.
CONCLUSIONS
The disability-inclusive MAMI training can strengthen the capacity of frontline healthcare workers, empowering them to provide adequate and inclusive services for infants and mothers with disabilities. Policymakers and program implementers should take concrete action to strengthen national capacity in disability-inclusive MAMI and nutrition services, support ongoing mentorship for healthcare workers, integrate disability into health and development programs, and foster an enabling policy environment.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_175

MAIN FACTORS INFLUENCING CONSUMER ACCEPTANCE OF HEALTHY EATING SUPPORTING POLICIES?

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BACKGROUND AND OBJECTIVES
The transition to plant-based farming is a key strategy to promote healthier diets and achieve sustainable food systems while reducing pressure on water, land, and biodiversity (1,2). This transition requires behavioral and systemic changes, including policy actions supporting and incentivizing farmers who want to transition their production to plant-based agriculture (2). However, the success of such a shift depends heavily on consumer acceptance, as citizens' support influences politicians and market demand for plant-based products (3,4). This study aims to identify determinants of consumer acceptance towards policies supporting farmers in transitioning plant-based farming.
METHODS
Data Collection: A cross-sectional survey was conducted online by Enkätfabriken AB between November and December, 2024 in DE, EE, FI, LT, NO, PL and SE, (n=5250, 50% women). The questionnaire included sociodemographic characteristics and questions related to consumers' values, attitudes, and the level of acceptance on policies supporting a plant-based transition, (7-point Likert scale from 'Strongly Disagree' to 'Strongly Agree').
Data analysis: Linear regression was conducted using the policy proposition to support farmers transitioning to plant-based farming as outcome variable, and consumer attitudes, and values as explanatory variables, controlling for sociodemographic characteristics. Statistical significance was defined as $p < 0.05$
RESULTS
RESULTS: Consumer values Stimulation, Universalism, and Benevolence and attitudes towards plant-based foods (all $p < .001$) were positively associated with agreeing with policies supporting farmers who want to transition their production to plant-based farming ($p < .001$).
CONCLUSIONS
Conclusion: Individuals who prioritize excitement, broad-mindedness, and helping others, as well as those with favorable perceptions of plant-based foods, support policies facilitating plant-based transitions more. Therefore, advocating for a more sustainable diet requires targeted communication that addresses people's attitudes and values.
Funding: Locality Project (Europe, GA 101112884). Views are of the authors and do not reflect those of the funding agency.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_176

ASSESSING THE NUTRITIONAL STATUS AND MICRONUTRIENT GAPS IN SIERRA LEONE: A SCOPING REVIEW OF WOMEN, CHILDREN, AND ADOLESCENTS

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BACKGROUND AND OBJECTIVES
Objectives: This scoping review aimed to map and analyze the breadth of quantitative studies on nutrition conducted in Sierra Leone, with a particular focus on children, adolescents and women of reproductive age. It highlights research gaps and identifies key findings on malnutrition, micronutrient deficiencies, and associated health outcomes in the country.
METHODS
A scoping literature review was conducted to identify quantitative studies published between January 1, 2000, and May 1, 2024. The review included peer-reviewed articles and reports, excluding qualitative studies, that assessed nutrition-related outcomes such as anthropometric indicators, micronutrient status, and feeding practices in Sierra Leone among, children under five years, adolescents and women of reproductive age (15 - 49 years).
RESULTS
The review included 39 studies. Most studies employed cross-sectional designs (n=25), with fewer using secondary data analysis (n=9), randomized controlled trials (n=3), or quasi-experimental designs (n=2). Studies predominantly addressed acute malnutrition, stunting, anemia, and micronutrient deficiencies. Prevalence estimates for wasting ranged from 4.8% to 30% in children, while stunting ranged from 29.1% to 41.8%, with disparities across regions. Anemia prevalence exceeded 60% in children under five and 76.3% in some populations. Few studies explored comprehensive micronutrient panels, with most focusing on hemoglobin, ferritin, and iodine status. Data on adolescent nutrition were scarce, with only two studies disaggregating RESULTS for this group. Research gaps were identified in dietary diversity, zinc deficiency, riboflavin, and vitamin D status. Overweight and obesity, particularly among women (27%–30%), emerged as an additional public health concern.
CONCLUSIONS
CONCLUSIONS: This scoping review underscores the urgent need for nationally representative, age-disaggregated nutritional surveys in Sierra Leone. These should assess comprehensive micronutrient status and dietary practices while addressing the double burden of malnutrition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_177

ONGOING NUTRITION TRANSITION IN URBAN AFRICA, EXPLORING THE LIVED EXPERIENCES AND POLICY LANDSCAPE TO MANAGE THE TRANSITIONS: A QUALITATIVE INQUIRY IN URBAN ZAMBIA

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BACKGROUND AND OBJECTIVES
Zambia is experiencing a nutrition transition, due to fast changing food environment but there are limited insights of the ongoing transformations. The study aimed to understand the food environment transitions based on people's lived experience and policy landscape to manage the transitions.
METHODS
A 2-step research design applying a photovoice technique (n=24) and key informant interviews with policy makers (n=18) was utilised. Purposive quota sampling based on; age (18 to 59 years), sex (n=12 per sex), and socio-economic status (urban poor vs middle class neighbourhoods) was applied to recruit photovoice participants. Photovoice included three sessions, 1) introduction, 2) 6-day photo taking exercise and 3) focus group discussions of photos (in groups of three). Photo-list/topical guide design were based on food environment framework. Data was transcribed verbatim and analysed thematically.
RESULTS
Experienced transitions include a dwindling diversity of healthy foods, alongside an increased availability and marketing of unhealthy foods due to mushrooming fast food chains, and emergence of supermarket and digital advertisement. Compounded by the desire for physiological satiety and convenience, and inadequate food knowledge and skills, the transitions are propagating a monotonous refined maize-based diet and fast-food culture. Due to food safety concerns in wet markets, supermarkets and home gardens have emerged as key trusted food sources. However, wet markets remain an important source for fresh foods. The aggressive unhealthy food marketing through social media, billboards, and strategic periodic promotions is perpetuating higher social status norms, out of home eating trend and dependence on unhealthy foods. The public perceived that, food labels and the marketing information need to give more information with regards to potential risk factors. Policy-wise, focus is on bottom-up approaches, as structural strategies are viewed as complex due to intricacy of balancing economy and public health priorities. Nevertheless, policy makers see opportunities in public-private partnerships incentivising agricultural diversification, wet markets improvements, reformulation strategies, labelling innovations, healthy food placement nudging guidelines in retail chains and schools.
CONCLUSIONS
The food environment is increasingly perpetuating obesogenic behaviours. Current policy landscape is focused on bottom-up approaches. However, a combination with structural approaches encompassing public-private partnerships is needed.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_178

ASSOCIATION BETWEEN MEALTIME TELEVISION VIEWING, LIFESTYLE AND SEVERE CHILDHOOD OBESITY IN THE ENPIMAD STUDY

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BACKGROUND AND OBJECTIVES
There is growing evidence associating TV watching during meals with poorer diet quality and weight outcomes. However, little is known about the relationship of lifestyle factors with the risk of severe obesity. Therefore, the aim of the present study is to analyse the associations between TV watching during meals and the risk of severe obesity and poor lifestyle behaviours.
METHODS
A cross-sectional study was conducted on a representative sample of schoolchildren from Madrid (Spain). TV during mealtime, sleep duration (SD), screen time (ST), adherence to Mediterranean Diet (AMD), and socio-economic status (SES) were collected via questionnaires. Height and weight were measured. Severe obesity was defined as BMI above +3SD of WHO BMI-for-age z-scores. Clusters of lifestyle behaviours were identified by K-means cluster analysis, and multinomial logistic regressions adjusted by sex, age and SES were used to explore associations between severe obesity, eating at least one meal in front of TV, and lifestyle clusters.
RESULTS
Three lifestyle clusters were identified: 1. Healthy Cluster (HC) characterized by high SD and AMD and low ST; 2. Mixed cluster (MC) characterized by low SD, ST, and AMD; 3. Unhealthy cluster (UC), characterized by low SD and AMD and high ST. Almost 5% of the sample presented severe obesity and 69% of the sample made at least one meal in front of TV. Children who made at least one meal in front of TV were 4.2 times more likely to be in the UC. Children in the UC were more likely to present severe obesity (OR: 2.00; 95%CI: 1.30, 3.01), as were those who made at least one meal in front of TV (OR: 1.68; 95%CI: 1.13, 2.49). After including lifestyle clusters as a covariate this association persisted but the OR was lower (OR: 1.54; 95%CI: 1.03, 2.29).
CONCLUSIONS
Watching TV during mealtime increases the probability of having poorer lifestyle behaviours and presenting severe obesity. The associations between TV watching during mealtimes and severe obesity may be partially mediated by lifestyle behaviours.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_179

DETERMINANTS OF THE NUTRITIONAL STATUS AMONG SCHOOL AGE CHILDREN (6-12) YEARS; A QUASI EXPERIMENTAL STUDY

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BACKGROUND AND OBJECTIVES

School age is a dynamic period of physical growth as well as the mental development of the child. The physical and mental/cognitive development of school-aged children is greatly a reflection of their nutritional status[1]. Malnutrition continues to be a major public health problem among school-aged children in developing countries, affecting a significant number of school-age children influencing their health, growth, development, and academic school performance[2]. In Cameroon, there is not much documented data on the nutritional status of this category of children. The aim of the study was to investigate the determinants of Nutritional status among school-aged children

METHODS

A quasi experiment was conducted with 294 primary school age pupils, comprising 139 males and 155 females in a rural setting. These pupils were randomly selected from three mission schools in 2 villages with similar socioeconomic characteristics in the North West Region of Cameroon. Anthropometric measurements and a 24-hour dietary recall for mothers were collected at baseline and same will be done after six months of intervention. Data were analyzed using SPSS and WHO athro-plus.

RESULTS

The RESULTS of the study revealed majority of the participants were female in the intervention and control arms with 53.9%, 51.8% respectively. The prevalence of underweight was 15% in the control group and 18% in the intervention group. Stunting rates were 20% for control group and 25% for the intervention group. Rates of overweight and obesity were low in both groups. Maternal knowledge of malnutrition was significantly associated with nutritional status, showing 42.2% awareness in the intervention group compared to 28.9% in the control group ($p<0.05$). It is worth noting that the Dietary Diversity Scores (DDS) was very poor with 100% of children in the intervention group compared to 82% in the control group.

CONCLUSIONS

RESULTS highlight that factor such as household income, education level of parents, household conditions and frequency of meals; fruits and vegetables significantly affect children's nutritional outcomes, suggesting a need for targeted interventions to improve child health in rural settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_180

RELATION OF A LIFESTYLE RISK INDEX WITH VISCERAL ADIPOSE TISSUE IN THE GERMAN NATIONAL COHORT (NAKO): EFFECT MODIFICATION BY SEX AND BODY MASS INDEX

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BACKGROUND AND OBJECTIVES
Visceral adipose tissue (VAT) accumulation confers additional chronic disease risk beyond high body mass index (BMI) and is associated with common lifestyle behaviors. As sex and/or BMI may modify this relation, we examined differences in the relation of a Lifestyle Risk Factor Index (LSRI) with VAT among participants of the German National Cohort (NAKO) who had undergone magnetic resonance imaging (MRI).
METHODS
Based on questionnaires completed at cohort entry, LSRI scores were assigned (1 point each for consuming <1 (women)/<2 (men) alcoholic drinks/day, ≥150 minutes/week of physical activity, not smoking, and adhering to ≥3/7 dietary recommendations). A food frequency questionnaire allowed estimation of dietary intakes. BMI categories (healthy weight: <25; overweight: 25-<30; obese: ≥30 kg/m2) were assigned. VAT volumes were obtained from standardized 3T MRI images and analyzed using deep learning-based image segmentation. We applied general linear models to estimate the association of LSRI with VAT, to perform trend tests with the continuous LSRI variable, to assess effect modification using interaction terms, and to compute age-adjusted VAT levels by LSRI according to sex and BMI.
RESULTS
Of 18,508 participants with complete information, the respective proportions for 0/1, 2, 3, and 4 LSRI points were 7%, 24%, 51%, and 18%. Overall, 44% of the participants reported normal weight, 38% overweight and 18% obesity. The geometric mean for VAT was 2.70 liters (95% CI 2.67, 2.73 liters; Q1-Q3: 1.60-4.75 liters) with higher mean volumes for men (3.71, 95%CI 3.66, 3.75 liters; Q1-Q3: 2.49-5.85 liters) than women (1.81, 95%CI 1.78, 1.83 liters; Q1-Q3: 1.11-2.99 liters). In multivariable models, participants with LSRI scores of 4 vs. 0/1 had lower mean volumes of VAT (2.3; 95%CI 2.2, 2.3 vs. 3.0; 95%CI 2.9, 3.1 liters). Adding BMI to the model slightly attenuated the difference across categories: (2.4; 95%CI 2.4, 2.4 vs. 2.9; 95%CI 2.8, 3.0) liters. Each individual lifestyle factor was inversely associated with VAT levels. As indicated by higher regression coefficients, the associations between LSRI and VAT were stronger among individuals with normal weight or overweight than people with obesity (p for interaction=0.001), but they were statistically significant across all BMI subgroups. No significant interaction of LSRI with VAT by sex was detected.
CONCLUSIONS
The RESULTS support the hypothesis that a composite LSRI is associated with lower VAT levels independent of BMI. The stronger association in participants with normal than elevated BMI suggests a greater influence of excess body weight on VAT than lifestyle behaviors alone.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_182

PARENTING FACTORS AND PHYSICAL GROWTH STATUS IN JAPANESE CHILDREN AND ADOLESCENTS

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BACKGROUND AND OBJECTIVES
Child stunting and obesity are serious public health concerns in Japan. Parental attitudes towards food choices, lifestyle, and socioeconomic status play crucial roles in healthy child growth and development. However, studies exploring these relationships are limited. This study aimed to examine the association between physical growth status and child-rearing factors.
METHODS
Children and adolescents aged 5-19 years (n = 678) who participated in the 2018 National Health and Nutrition Survey were included in this analysis. Body mass index for age z-score (BAZ) and height-for-age z-score (HAZ) were calculated using WHO growth standards. Parental attitudes towards food choices, parental health behaviors (smoking status, alcohol consumption, body mass index, regular exercise, and sleep status), parental work status, household income, number of household members, and municipality of residence were considered as child-rearing factors.
RESULTS
Multiple logistic regression analyses showed that children whose parents did not prioritize nutritional value in food choices were marginally more likely to be stunted (adjusted odds ratio (aOR) 2.81, 95% confidence interval (CI): [0.95 – 8.32]). Children from high-income households were less likely to be thin compared to those from middle-income families (aOR 0.23, 95%CI: 0.07 – 0.84). Children of parents who smoked or were overweight or obese (BMI 25 or more) were more likely to be overweight or obese (smoking - aOR 2.04, 95%CI: 1.14 – 3.64; obesity - aOR 1.96, 95%CI: 1.14 – 3.37), while children of parents with a BMI less than 18.5 were less likely to be overweight or obese (aOR 0.13, 95%CI: 0.02 – 0.94).
CONCLUSIONS
This study found that child undernutrition was associated with parental nutrition knowledge and household income, while child overweight including obesity was related to parental smoking and BMI. Further research is warranted to develop targeted interventions that support families facing child-rearing challenges, particularly those at risk of malnutrition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_183

FOOD INSECURITY WAS ASSOCIATED WITH UNHEALTHY LIFESTYLE PATTERN IN MEXICAN UNIVERSITY STUDENTS: ACCUMULATED CHALLENGES THAT UNIVERSITIES CAN ADDRESS

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BACKGROUND AND OBJECTIVES
An unhealthy lifestyle has been positively associated with adverse health situations. Several sociodemographic factors have been associated with adherence to an unhealthy lifestyle. However, few studies analyze the association between food insecurity (FI) and lifestyle in university students; none exist in the Mexican population. The objective was to analyze the association between food insecurity and lifestyle clusters in Mexican university students.
METHODS
Cross-sectional study (macroproject on food insecurity; registered opinion: CI-02322). We evaluate online demographics (age, sex, study program, employment situation, etc.), alcohol/tobacco consumption, food insecurity (ELCSA), sleep quality (Pittsburgh), physical activity (IPAQ), diet quality (Mini-Ecca, v2), and symptoms of stress, anxiety, depression (DASS-21). The lifestyle clusters were generated using hierarchical analysis, Ward's method, and Euclidean distance. The associations were analyzed with logistic regression.
RESULTS
Four hundred twenty-nine participants were included; 71.8% were women, 23.3% were nutrition students, 24% had mild-FI, and 21.9% had moderate/severe-FI. Three lifestyle clusters were identified. Cluster-1 “Healthy-lifestyle” (n= 156): most were characterized by performing moderate to vigorous physical activity (64.7%), their diet quality was healthy (62.2%), they never or rarely consumed alcoholic beverages (85.9%), only 3.8% reported smoking and 25% had good sleep quality. Cluster-2 “Unhealthy lifestyle, no alcohol/tobacco consumption” (n= 147): 51% practice low physical activity, 100% have poor diet quality, 81% have poor sleep quality; however, 100% had never or rarely consumed alcoholic beverages, and only 1.4% reported smoking. Cluster-3 “Unhealthy” (n= 126): 55.6% performed low physical activity, 85.7% had an unhealthy diet quality, 98.4% consumed alcoholic beverages more than 2 times/month, 19% reported smoking, and 86.5% had poor sleep quality. Presenting moderate/severe FI (OR: 1.96; 95%CI: 1.08, 3.56) was positively associated with cluster-2-“Unhealthy lifestyle, no alcohol/tobacco consumption,” after adjusting for age, sex, study program, and employment situation. This association remains significant after additionally adjusting for anxiety (OR: 1.91; 95%CI: 1.05, 3.48), depression (OR: 1.91; 95%CI: 1.05, 3.47) and stress (OR: 1.90; 95%CI: 1.04, 3.46).
CONCLUSIONS
FI in Mexican university students is positively associated with a lifestyle characterized by low physical activity, poor diet quality, and poor quality sleep without tobacco and alcohol consumption.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_184

Preliminary Sensory Panel RESULTS to Evaluate Acceptability of Four Flavors of a Dried Fish Powder-Fortified Complementary Instant Porridge Among Infants and Young Children in Zambia

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BACKGROUND AND OBJECTIVES
Zambia has made significant progress in reducing infant and young child (IYC) malnutrition in the last two decades, yet rates of stunting and wasting remain high (particularly in rural areas) [1]. Among Zambian children under 5 years, 35% are stunted and 4% are wasted [1]. In order to help fill protein and nutrient gaps among vulnerable IYC, we conducted sensory panels of different flavors of Complementary Food for Africa+Dried Fish Powder (ComFA+Fish) Instant Porridge, which we fortified with dried fish powder (DFP) made from locally sourced whole pelagic small fish from Zambia's Lake Kariba.
METHODS
During four sensory panels conducted over two days, caregivers evaluated whether their IYC found four flavors of ComFA+Fish Instant Porridge acceptable. These all-naturally flavored porridges included: 1) Plain; 2) Vanilla; 3) Vanilla+Extra DFP; 4) Strawberry. The protocol was informed by Madrelle et al. and others [2-5] and successfully implemented by the researchers during three sets of panels [6,7]. Caregivers were instructed to feed each instant porridge to their child during three consecutive tasting intervals. Each serving size was 50 g (~8 oz), and all IYC were fed their portion of porridge using identical infant spoons and identical 8 oz. BPA-free bowls. For each panel, caregivers fed the porridge to their child during 3 consecutive tasting intervals of Time 1 (T1)–Time 3 (T3). Caregivers assessed their child's global liking of each porridge at T1–T3 using a set of 5 descriptors of positive/negative behaviors exhibited by their child that correlated with a five-point hedonic scale where 1=extremely disliked and 5=extremely liked. We dichotomize the RESULTS into: disliked/extremely disliked, neutral, liked/extremely liked. The purposive sample included 33 IYC who ranged in age from 6-23 months.
RESULTS
Just over 42% of the IYC were aged 6-11 months and 63.6% were female. Porridge RESULTS: Plain: T1) 81.8% liked/extremely liked; T2) 81.8% liked/extremely liked; T3) 71.9% liked/extremely liked. Vanilla: T1) 84.9% liked/extremely liked; T2) 87.9% liked/extremely liked; T3) 90.3% liked/extremely liked. Vanilla+Extra DFP: T1) 70% liked/extremely liked; T2) 65.5% liked/extremely liked; T3) 62.1% liked/extremely liked. Strawberry: T1) 96.5% liked/extremely liked; T2) 96.5% liked/extremely liked; T3) 96.2% liked/extremely liked.
CONCLUSIONS
When T1-T3 were averaged, overall scores were ranked as follows: Strawberry=96.4% liked/extremely liked; Vanilla=87.7% liked/extremely liked; Plain=78.5% liked/extremely liked; Vanilla+Extra DFP=65.9% liked/extremely liked.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_186

IMPORTANCE AND CHARACTERISTICS OF BREAST MILK COMPOSITION IN BULGARIAN NURSING MOTHERS FOR INFANT DEVELOPMENT

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BACKGROUND AND OBJECTIVES
Breast milk provides essential nutrients, including proteins, carbohydrates, vitamins, minerals, and trace elements, in amounts tailored to meet the specific needs of infants at different stages of growth. This study aims to analyze the chemical composition of 30 breast milk samples (both fresh and frozen) in two breastfeeding periods, collected from 15 volunteer mothers who provided informed consent.
METHODS
GC, spectrophotometric, HPLC, volumetric, weight and computational methods were used to determine: fatty acids, fructan, vitamins A, E, B2, lactose, moisture, protein, ash, fats, carbohydrates, and energy
RESULTS
The proportion of saturated fatty acids (SFAs) and monounsaturated fatty acids (MUFAs) in breast milk is relatively constant. In 85% of the samples at the first time point analyzed, which corresponds to 2-4 weeks of lactation, the content of fructooligosaccharides is higher compared to the second time point analyzed at 14-16 weeks. These findings confirm the role of oligosaccharides in the initial stages of the formation of the intestinal microbiome, mainly associated with colonization by bifidobacteria.
CONCLUSIONS
It is found that the nutritional composition of breast milk is influenced by certain factors related to the mother (dietary regimen, age and food intake, stages and duration of breastfeeding, behavioral habits (smoking and alcohol), concomitant diseases (hypertension, diabetes mellitus, etc.). These factors account for the significant variations observed in the values of the various indicators in the experimental samples, which outline individual-specific profiles.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_187

CONSUMER AWARENESS, USAGE AND ATTITUDE TOWARDS FOOD LABELLING: A STUDY IN TWO SUBURBS IN SANDTON, GAUTENG, SOUTH AFRICA

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BACKGROUND AND OBJECTIVES
In South Africa, overweight and obesity are pressing public health concerns. The Department of Health has proposed a front-of-pack nutrition labelling (FOPNL) tool as part of efforts to strengthen the national strategic health plan and address obesity, diabetes, hypertension, and heart disease. However, there is limited confidence that South Africans fully understand existing food labelling or consistently use labels to inform their food choices. This study aimed to determine the level of awareness, attitude, and utilisation of food labels by consumers in two targeted suburbs in Sandton, Gauteng.
METHODS
This study employed a cross-sectional design, with a sample size of 385 South African participants aged 18 years and older, representing all racial groups focusing on two locations in Gauteng, South Africa: Sunninghill, a high-income area, and Alexandra, a low-income area in Sandton.
RESULTS
Many participants lacked an understanding of key labelling information such as ingredients, nutritional content, and warning labels. Despite recognising the importance of food labels, their actual use in making informed purchasing decisions was low. The result for consumer usage of labels indicated that labels about expiry dates (mean = 3.25) are used significantly more often than labels regarding the product or general information (mean = 2.19), $t(384) = -18.716$, $p<0.001$. Education level positively correlated with the usage of labels for both general and specific product information, rho = .356, $p<0.001$. Those with a higher education level in the higher income suburb showed greater use and engagement with labels. The RESULTS also indicated that females (mean = 3.59) have a more favourable attitude toward food labels than males (mean = 3.37), $p=0.020$. A significant correlation between awareness and understanding of general food labels showed a positive correlation with attitude towards food labels, $r = .418$, $p<0.001$. Labels with general information were regarded as significantly important (mean = 3.82, $p<0.001$); while labels regarding the specific product were regarded as neither important nor unimportant (mean = 3.07, $p=0.240$).
CONCLUSIONS
Consumers are not very aware or knowledgeable about food labels despite location, education, or income profile in awareness, usage and attitude towards food labelling. The findings underscore the need for enhanced consumer education and awareness programmes to improve the interpretation and use of food labels, crucial for informed dietary choices.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.
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EPO5_188

CHANGES IN NUTRITION QUOTIENT ITEMS FOR ASSESSING DIET QUALITY AND EATING BEHAVIORS AMONG KOREAN CHILDREN

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BACKGROUND AND OBJECTIVES
This study aims to present updates to the Nutrition Quotient for Children (NQ-C), a tool designed to assess diet quality and eating behaviors among Korean children.
METHODS
The NQ-C is revised every 4 to 5 years through a systematic process. The first step involves selecting candidate items via a literature review of children's nutrition, along with an analysis of food and nutritional status using data from the Korea National Health and Nutrition Examination Survey (KNHANES). The second step involves selecting checklist items through a validity assessment conducted with pilot survey data from primary school students. The third step entails developing the NQ model and calculating weights for each factor and item through confirmatory factor analysis using nationwide survey data.
RESULTS
The original NQ-C, developed in 2012, consisted of 19 items across 5 factors. The revised version in 2016 included 20 items across 5 factors, while the most recent 2021 revision consisted of 19 items grouped into 3 factors: balance (0.15), moderation (0.20), and practice (0.65). The 2016 revision added 9 items and removed 7 compared to the 2012 NQ-C, while the 2021 revision added 3 items and removed 4 compared to the 2016 version.
CONCLUSIONS
The NQ-C has been continuously updated to reflect changes in the dietary environment and behaviors of children. It has been widely utilized to assess the dietary quality and eating behaviors among Korean children, as well as evaluating the effectiveness of nutrition policies and education.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_189

HEALTHCARE SERVICES AND HOME ENTERAL NUTRITION PRACTICES IN A BRAZILIAN REGION

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BACKGROUND AND OBJECTIVES
Health Information Systems (HIS) are essential for recording and collecting data and planning actions in health systems. In the Brazilian Unified Health System (UHS), one HIS is the National Registry of Health Establishments/Services (NRHE) (Rocha et al., 2018). However, the NRHE does not present a specific record for Home Enteral Nutrition (HEN) in the different UHS services. The study's objectives were to propose a strategy for collecting data regarding HEN in HIS and describe HEN in healthcare services in a Brazilian region.
METHODS
Observational, cross-sectional, and descriptive study carried out with information obtained from the NRHE between May and August 2024. The available NRHE codes were checked to define a data search strategy on HEN. After the definition, the types of establishments with HEN and their distribution in the states of the Southeast Region of Brazil were verified. Data were analyzed using descriptive statistics.
RESULTS
The proposal for data collection was the use of codes for specialized services, “Home Care (HC)” and/or “Nutritional Support (NS).” When the establishment/service had specialized HC and NS services together, it was considered that the service had HEN. Regarding the number of health establishments with HEN, the Southeast region had 126, of which 52.4% (n=66) were located in the state of São Paulo, 22.3% (n=28) in Minas Gerais, 21.4 % (n=27) in Rio de Janeiro and 3.9% (n=5) in Espírito Santo. Regarding the type of service, 79.4% (n=100) of Specialized Hospital Care, 9.5% (n=12) of Primary Health Care, 7.2% (n=9) of Specialized Care Outpatient, 3.9% (n=5) from Home Care Service and none from Health Management Center.
CONCLUSIONS
It was possible to propose a data search strategy on HEN based on existing codes in the NRHE. São Paulo had a more considerable number of healthcare services with HEN, and the biggest number of HEN records were observed in Specialized Hospital Care. However, it is essential to create a specific code for HEN in the NRHE to enable more accurate recording and collection of information.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_191

THE ROLE OF SOCIAL JETLAG IN THE ASSOCIATION BETWEEN EATING JETLAG AND BMI Z-SCORE IN CHILDREN

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BACKGROUND AND OBJECTIVES
Emerging evidence suggests that high variability in meal timing between weekdays and weekends, termed "eating jetlag," may be associated with an increased risk of obesity in adults. However, studies in children are lacking. Additionally, social jetlag—a mismatch between biological sleep-wake rhythms and social schedules—may play a moderating role in these associations. We studied whether eating jetlag is associated with BMI z-score among preschool-aged children in Finland and whether social jetlag moderates this association.
METHODS
This cross-sectional study included 639 Finnish children (3-6 years, 48% females) from the DAGIS survey conducted in 2015-16. Eating jetlag was calculated as the absolute difference between the eating midpoint on weekends and weekdays, based on 3-day food records. Social jetlag was determined as the sleep debt corrected absolute difference between the sleep midpoint on weekends and weekdays based on hip-worn actigraphy data. BMI z-score, based on Finnish growth references, was calculated from researcher-measured height and weight. We conducted analyses using linear regression models and moderation was tested by including an interaction term between eating jetlag and social jetlag. Analyses were adjusted for age, sex, chronotype, sleep duration, parental educational level, physical activity, and energy intake.
RESULTS
Social jetlag moderated the association between eating jetlag and BMI z-score (*p*interaction= 0.008). Among children with greater social jetlag (≥ 1 hour), eating jetlag was negatively associated with BMI z-score (β=-0.85, 95%CI: -1.33, -0.37, *p*= 0.001). In contrast, no significant association was observed among children with less than 1 hour of social jetlag (β=0.05, 95%CI: -0.11, 0.22, *p*= 0.53).
CONCLUSIONS
These findings suggest that social jetlag may influence the relationship between eating jetlag and BMI in young children, as we found that greater variability in meal timing was associated with lower BMI among children with greater social jetlag. While previous studies on adults have linked eating jetlag to higher BMI, they have not examined the potential moderating role of social jetlag. Our findings highlight the importance of considering biological rhythm factors when studying meal timing-obesity associations. Further studies are needed to confirm these RESULTS and explore the underlying mechanisms.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_193

ADIPOSITY AND PHASES OF STRESS IN PUBLIC SAFETY WORKERS

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BACKGROUND AND OBJECTIVES
Stress, a state of tension that disrupts the body's balance, may be classified into tree phases: alert, resistance, and exhaustion. However, the literature does not present a consensus about phases of stress and changes in body composition. In this context, public security servers are more vulnerable to stress due to the demands of their profession. Thus, the main objective os this study was to evaluate the association between the phases stress and adiposity indices of public security servers.
METHODS
A cross-sectional observational study was conducted from March to August 2023 with active security servers public from a state in southeastern Brazil, which are the municipal guards; firemen; servers of security sector with administrative/management activities, civil, military, federal and road. The sample calculation was carried out considering the total number of active servers (n=4.767), a stress prevalence of 52%, acceptable margin error of 5% and confidence level of 90%. In this way, a target sample of 256 individuals in which body composition was assessed using bioelectrical impedance analysis, and at the same moment stress phases were evaluated through the Adult Stress Symptom Inventory (ISSL) validated for the Brazilian population (Lipp; Guevara, 1994). For statistical analysis, sample characterization, variable description, and adjusted linear regression analysis were performed.
RESULTS
The final sample (n=264) was predominantly composed by male (73.6%), with a median age of 40 years, self-identified as brown color (49.0%), worked in the metropolitan region of the state (81.9%), with indoor job duties (59.2%), and had completed high school or technical education (65.4%). The RESULTS indicated that 48.1% of the officers were identified as stressed, with a higher proportion among women (60.3%) ($p=0.017$). Analyzing the stress phases, the resistance phase showed a positive association with body fat percentage ($\beta=0.149$; IC95%: 0.236 – 5.859), central body fat ($\beta=0.188$; IC95%: 0.327 – 4.128), total body fat ($\beta=0.165$; IC95%: 0.153 – 7.210), and visceral fat ($\beta=0.181$; IC95%: 0.273 – 3.862), even after adjusting for confounding variables ($p<0.05$ for all).
CONCLUSIONS
The RESULTS revealed a high percentage of stress, especially in women, and a positive relationship between the resistance phase and adiposity. These findings highlight the need for changes in working conditions and lifestyle among officers, given the direct influences of stress and body composition on their professional performance.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_197

FOOD CONSUMPTION AND EATING BEHAVIOURS OF CHILDREN AGED 6 TO 36 MONTHS LIVING IN URBAN ABIDJAN, CÔTE D'IVOIRE: THE VICTORY STUDY

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BACKGROUND AND OBJECTIVES
Micronutrient deficiencies, often resulting from the consumption of diets with low nutritional value and diversity, remain a major public health concern for children of low-income countries. Understanding food consumption practices is crucial to provide evidence-based foundation for the design and implementation of effective intervention strategies to address micronutrient deficiencies in vulnerable geographies and populations.
The objective was to collect food consumption data in 6 to 36-month-old healthy children from Abidjan, Côte d'Ivoire.

METHODS
Food and beverage intake of healthy 6- to 36-month-old children was collected by their mother using an interview-based 24-hour dietary intake questionnaire. A baseline questionnaire including medical history, feeding practices, and anthropometric measurement were collected. Dietary intake was assessed after classification based on foods groups and subgroups defined by the FAO/WHO, adjusted to reflect Ivorian food specificities. Dietary quality was evaluated through dietary diversity scores.
RESULTS
407 children were included (6- to 11-month-old: n=213; 12- to 23-month-old: n= 135; 24- to 36-month-old: n=59; 53% female). Exclusive breastfeeding prevalence between 0 and 6 months was 37%. Breastfeeding continuation rates were 85%, 38%, and 3% in the 6- to 11-, 12- to 23- and 24- to 36-month-old group, respectively. The most consumed food groups were dairy (92% of the sample), cereals (88%), roots, tubers and starchy foods (38%), fish (49%), and vegetables (41%), while meat (11%), fruits (15%), eggs (15%), pulses (3%) and seeds and nuts (2%) were seldom consumed. Milk intake decreased with age while cereal and starchy food consumption increased. Dietary diversity was low (3,3 ± 1.4), increasing with age. The proportion of children not meeting the minimum dietary diversity was 74%.
CONCLUSIONS
Our study provides dietary intake data in 6- to 36-month-old children from Côte d'Ivoire, supporting the renewal of nutritional recommendations and policies. Increasing the intake of nutrient-dense foods such as fruits, meats, eggs, and pulses is essential for children to meet the minimum dietary diversity and ensure nutritional adequacy.
CONFLICTS OF INTERESTS
JH.B, P.D-P, and J.D are employees of Danone Research. SP. S, A.C and SOP.A-T have no conflicts of interest.

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EPO5_198

IDENTIFICATION OF THE ROLE AND COMPETENCIES OF STAKEHOLDERS INVOLVED IN THE IMPLEMENTATION AND MONITORING OF THE BRAZILIAN NUTRITIONAL FOOD LABELING REGULATION

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BACKGROUND AND OBJECTIVES
The Brazilian nutritional labeling regulation of packaged foods, which includes requirements for front-of-package nutritional labeling on certain products, was enforced in October 2022. Studying the implementation and monitoring of compliance with the norms of a regulatory public policy allows identifying existing facilitators and barriers and highlights the need for improvements in the process. This study aimed to identify the stakeholders involved with the regulation, their roles regarding the implementation and monitoring of compliance with the standards, and to verify whether these roles are being fulfilled.
METHODS
A literature review of secondary data was conducted to identify the stakeholders and their roles. Questionnaires were sent to the Brazilian Health Surveillance Agency (Anvisa), Central Public Health Laboratories (Lacen), and municipal and state health surveillance agencies (VISA) based on the Access to Information Law (LAI) to investigate the fulfillment of their responsibilities. The data obtained were qualitatively analyzed using thematic content analysis.
RESULTS
The stakeholders identified included Anvisa, VISA, Lacen, the private sector, and non-governmental organizations. Most of the roles assigned to the implementation of the new standards - preparation of guidance materials, provision of training, and actual monitoring of the regulated sector - are being fulfilled by public agencies. However, the procedures related to monitoring are still deficient compared to what is expected.
CONCLUSIONS
The data demonstrated a need for greater investment and strengthening of health inspection actions and the development of implementation and monitoring protocols for nutritional labeling standards of packaged food. These protocols should connect the actions of all operational levels of the National Health Surveillance System (SNVS) and enable timely work aligned with the objectives of public food and nutrition policies.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_199

NOVEL HIGH-DIMENSIONAL MEDIATION APPROACH TO ASSESS PORK CONSUMPTION'S EFFECTS ON LIPID PROFILES

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BACKGROUND AND OBJECTIVES
Nutritional epidemiology faces the critical challenge of accounting for the complex interplay of multiple confounding factors when evaluating dietary impacts on health outcomes. This study aims to clarify the effects of pork consumption on lipid profiles by applying a high-dimensional mediation analysis. This innovative approach distinguishes direct effects from those mediated by socio-demographic, dietary, and lifestyle factors, providing more reliable estimates and addressing the limitations of traditional methods.
METHODS
The analysis will use data from the National Health and Nutrition Examination Survey (NHANES) 2007–2018, focusing on adults with complete dietary and laboratory data. Pork consumption, classified into fresh and processed pork, will be assessed using 24-hour dietary recall data. Lipid profiles, including total cholesterol, HDL, LDL, and triglycerides, will serve as outcomes. The methodology uses machine-learning techniques for dimensionality reduction to handle correlations among multiple mediators, such as socioeconomic status, dietary patterns, and health behaviors. This process reduces high-dimensional data into latent variables, which are then incorporated into a traditional mediation model to estimate direct and indirect effects. The robustness of the findings will be ensured through rigorous validation procedures.
RESULTS
Analyses are currently ongoing to define and evaluate the intake of food groups and validating the high-dimensional mediation framework.
CONCLUSIONS
This study addresses a key limitation in nutritional epidemiology by applying advanced analytical techniques to untangle the complex relationships between pork consumption and lipid profiles. The findings are expected to provide clearer, evidence-based insights into how dietary and lifestyle factors influence these associations, ultimately informing public health recommendations and dietary guidelines.

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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_201

EXPLORING MATERNAL DIETARY PATTERNS DURING THE COVID-19 PANDEMIC AND THEIR RELATIONSHIP TO HEALTH LITERACY

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BACKGROUND AND OBJECTIVES

Pre-COVID-19 pandemic studies have shown sub-optimal dietary diversity in Ghanaian pregnant women based on the WHO minimum dietary diversity for women (MDD-W). Additionally, no published studies have examined maternal diet quality during the pandemic in Ghana. This analysis aimed to assess the relationship between health literacy (HL) and a posteriori-derived dietary patterns of women pregnant during the pandemic.

METHODS

Data was obtained from an online survey of mothers between July 2021 and January 2022. Mothers were eligible if they had an infant between 0-12 months (July-Nov 2021) and up to 15 months (Dec 2021-January 2022) to capture pregnancies carried in 2020. Dietary intake during pregnancy was retrospectively assessed using a 30-item semi-quantitative food frequency questionnaire (FFQ) designed for the study and based on pre-existing knowledge of local Ghanaian foods, FAO dietary guidelines, and relevance to the WHO MDD-W food groups. Maternal energy and protein intakes were assessed using all 30 items of the FFQ. A total of 221 mothers had complete dietary data, out of which three were excluded for daily Calorie values <500 kcal or > 5000 kcal (final N=218). Dietary patterns were obtained using hierarchical cluster analysis of 14 food groups derived from 22 food items on the FFQ. HL was assessed using the All Aspects of Health Literacy (AAHL) scale. A multinomial logistic regression was used to assess the association between health literacy and the identified dietary patterns, adjusting for maternal age and total caloric intake.

RESULTS

Mean±SD age, daily energy and protein intakes were 29.4±5 years, 2010±816kcal, and 78±33g, respectively. Mean HL scores were 7.5±1.6 (total possible=9). Four dietary patterns were identified: low-diversity carnivorous (N=34), low-diversity egg-based (N=68), moderate-diversity plant-based (N=83), and high-diversity omnivorous (N=33). In the adjusted model, for every unit increase in AAHL scores mothers had significantly higher odds of having a moderate-diversity plant-based diet [aOR=2.00 CI: 1.43;2.81 p<.001] and a low-diversity egg-based diet [aOR=1.70 CI: 1.27;2.26 p=0.0003] compared to mothers with a low-diversity carnivorous diet. No statistically significant associations were observed between HL and a high-diversity omnivorous diet.

CONCLUSIONS

Assessments of “post-pandemic” diet quality using similar techniques may provide insights into whether the patterns identified in this analysis represent typical patterns of pregnant women.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_202

UNEQUAL PATTERNS AND TRENDS IN REDUCING STUNTING PREVALENCE IN UNDER 5-YEAR BRAZILIAN CHILDREN BETWEEN 1996 AND 2019

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BACKGROUND AND OBJECTIVES
Brazil has significantly reduced the prevalence of stunting in children under 5 years since 1990. However, the prevalence of stunting remained almost unchanged at roughly 7% between 2006 and 2019. We explored the prevalence of stunting in Brazil in the last two decades by child age groups and macro-regions of the country to identify gaps in progress.
METHODS
Data from three nationally representative surveys in Brazil were used: the National Survey on Demography and Health of Women and Children (PNDS-1996/2006) and the National Survey on Child Nutrition (ENANI-2019). Stunting was defined as height-for-age z-scores below -2 standard deviations from the WHO growth standard. We estimated the prevalence (95%CI) of stunting for each survey by age groups (0-11, 12-23, 24-59, 0-59 months) and macro-regions, using the survey and svyglm packages in R. Significant differences were examined by analyzing the overlap of the 95%CI. We calculated the relative change over time as a percentage difference in stunting prevalence between each survey.
RESULTS
Final samples included 3979, 4408, and 14553 children under 59 months of age in PNDS 1996, 2006, and ENANI-2019, respectively. The prevalence of stunting in children under 5 years was 13% in 1996, 7.3% in 2006, and 7.0% in 2019, a 47% reduction between 1996 and 2019, but only 4% between 2006 and 2019. The reduction in stunting prevalence was higher in children >24 months and varied according to macro-regions. The highest reduction was in the Northeast region in all age groups, particularly among children aged 24–59 months (23.1% [20.0-26.3] 1996 *vs* 3.9% [1.9-5.8] 2019). Reductions in the North region were statistically significant only among children > 24 months (19.0% [13.7-24.3] 1996 *vs* 8.2% [3.3-13.0] 2019. In the Southeast and Mid-West regions, reductions were only observed among children > 24 months between (6.7% [4.3; 9.1] 1996 *vs* 2.3% [0.7-3.9] 2006; 10.6% [5.8-15.4] 1996 *vs* 4.0% [3.0-5.0] 2019). There was no statistically significant change in stunting in the Southern region.
CONCLUSIONS
Stunting reductions in Brazil did not follow the same pattern by different age groups and macro-regions. While the most substantial progress in stunting under 59 months has been observed in the Northeast, progress was slow in other macro-regions. Therefore, continued attention to appropriately address regional and age-related differences is necessary to increase progress toward further reducing stunting and preventing its consequences.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_203

BREASTFEEDING RATES AND FACTORS ASSOCIATED WITH INFANT DIETARY DIVERSITY AMONG GHANAIAN MOTHERS DURING THE COVID-19 PANDEMIC

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BACKGROUND AND OBJECTIVES

Psychosocial impacts of the COVID-19 pandemic include increasing rates of maternal anxiety and depression. Effects on infant feeding, such as exclusive breastfeeding, have also been documented. The aim of this study was to examine predictive factors associated with maternal COVID-related anxiety and infant dietary diversity among Ghanian mothers.

METHODS

An online survey was administered to Ghanaian mothers with children 0-15 months old from June 2021 to January 2022. The Coronavirus Anxiety Scale (CAS) and the Obsession with Coronavirus scale (OCS), were used to assess maternal anxiety levels during the pandemic. Using the WHO Infant and Young Child Feeding (IYCF) Questionnaire (Q), mothers were asked questions about the initiation of and exclusive breastfeeding. For infants 6 months and older, dietary diversity (DD) was assessed using a structured qualitative 24-hr recall adapted from the WHO IYCF Q. Infant minimum DD (MDD) was based on consumption of at least 4 out of 7 food groups. Multivariate logistic regression was used to determine predictors of MDD. CAS and OCS were the main exposures of interest to capture maternal psychosocial wellbeing during the pandemic. We adjusted for covariates based on *a priori* criteria.

RESULTS

A total of 221 mother-infant dyads were analyzed. Ninety-five mothers had infants less than 6 months. For infants 6 months and older, a total of 126 mother-infant pairs were analyzed. The rates of probable dysfunctional coronavirus-related anxiety (CAS score ≥9) and probable dysfunctional thinking about COVID-19 (OCS score ≥7) were 11% and 33%, respectively. Fifty-eight percent (58%) of mothers with infants <6 months were not exclusively breastfeeding. The mean DD score among infants was 4.2 ±1.6food groups, with 36% not meeting the MDD. We did not observe statistically significant associations between CAS and OCS scores, and MDD ([aOR for CAS 0.974 CI 0.817-1.162] and [aOR for OCS=1.105 CI 0.935-1.306), social. S support was the only covariate independently and positively associated with MDD. Infants of mothers who reported that they had social support had a statistically significant 5.59 higher odds of meeting the MDD compared to mothers who reported no social support [aOR=5.590 CI 1.573-19.865].

CONCLUSIONS

Given the high proportion of infants not meeting the MDD, interventions aimed at improving DD for Ghanaian infants are needed. More elaborate social network analysis studies examining the most effective social support structures for mothers are also warranted.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_205

HOUSEHOLD WATER SECURITY, DIETARY DIVERSITY, AND NUTRITIONAL STATUS OF 6- TO 23-MONTH-OLD CHILDREN

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BACKGROUND AND OBJECTIVES
Household water security is an emerging concept in the study of child nutrition, particularly its role in the food preparation of complementary foods. This study aimed to assess the association of water security to diet diversity and nutritional status of 6- to 23-month-old children. Contextualizing the role of water in households provided an additional determinant in understanding child nutrition during the crucial first 1000 days.
METHODS
A cross-sectional study design was employed and a total of 149 households with children aged 6-to 23-months were randomly sampled. Data collection involved administering adapted versions of the Household Water Insecurity Scale and Minimum Dietary Diversity (MDD) questionnaires; and measuring children's weight and length using standard anthropometric methods. Associations between household water security, dietary diversity, and nutritional status were analyzed using Chi-square tests of independence and Cramer's V coefficient.
RESULTS
The study findings showed that 90% of the households were water secure; and 64% of children not meeting MDD with mean score of 3.93. Stunting was recorded at 26%, underweight at 9% and wasting at 7%. The findings revealed a significant association between household water security and weight-for-age and length-for-age. This suggests that access, use, and water reliability in households have an impact on underweight and stunting among children. On the other hand, there was no direct association observed between water insecurity and MDD. Additionally, having a dual-sourcing strategy for consumptive and non-consumptive purposes of water was observed as coping strategy of households in dealing with water interruption. Food preparation remained a priority, preserving consumptive purposes of water despite water stress in water-insecure households.
CONCLUSIONS
This study emphasized that water experiences at household level have substantial role on the nutritional outcomes of children. Further studies are warranted to widen the current knowledge on factors affecting household water security and its pathways to child nutrition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_206

NUTRITIONAL ENHANCEMENT OF COMPOSITE JAM VARIETIES, FORMULATED FROM LOCALLY SOURCED INGREDIENTS : A HEALTHIER ALTERNATIVE TO CONVENTIONAL OPTIONS

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BACKGROUND AND OBJECTIVES
The study investigates the Nutritional Enhancement of jam formulations created from composite ratios of zobo extract (Hibiscus sabdariffa), Gorontula (azanza garckeana) beetroot (beta vulgaris, African star apple(chrysophyllum albidum) and lemon (Citrus x limon in relation to a popular conventional jam sold in the market.
METHODS
Two kilograms of zobo calyces were sorted, washed, and boiled to create a clear extract. This was combined with one kilogram each of beetroot and gorontula, which were also sorted, washed, soaked, peeled, and blended to create a pulp. Additionally, half a kilogram of unripe lemon and one kilogram of African star apple were prepared for pectin extraction. The ingredients were heated to achieve a jelly consistency, yielding three composite jam samples (A, B, C) for analysis, alongside a conventional control sample (D). Proximate composition, micronutrient levels, and phytochemical content were determined using AOAC standard methods (2020).
RESULTS
Sample B exhibited a moisture content of 19.72%, indicating better shelf stability compared to control sample D (32.49%). Sample C had a high ash content (18.72%), suggesting it is mineral-rich and nutrient-dense, while sample D had only 10.34%. Sample C also contained lower carbohydrates (33.96%) compared to sample D (45.03%), making it a low-calorie option. Micronutrient analysis showed that the composite jams had higher magnesium (A: 8.77%, B: 6.84%, C: 6.30%, D: 2.80%), beta-carotene (A: 12.34%, B: 9.63%, C: 10.25%, D: 4.26%), and vitamin C (A: 6.72%, B: 6.83%, C: 7.84%, D: 2.84%), which are beneficial for muscle function and iron absorption. Phytochemical content was also elevated in the composite jams, particularly flavonoids (C: 8.68%) and phenols (A: 5.24%), compared to lower levels in sample D.
CONCLUSIONS
The study confirmed the composite jam made from zobo calyces and the locally sourced fruits to be nutrient-dense and thus, a healthy alternative to conventional jams.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_207

ASSOCIATION OF ANEMIA AND OBESITY AMONG FEMALE FACTORY WORKERS IN THAILAND

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BACKGROUND AND OBJECTIVES
Anemia and iron deficiency anemia (IDA) are still a prevalent health concern globally, particularly among women of reproductive age (WRA). However, the updated information on these problems in Thailand are scarce. This study aimed to determine the prevalence of anemia, iron deficiency (ID), and IDA among WRA working in factories in Thailand, and to investigate the association between anemia and body mass index (BMI).
METHODS
This cross-sectional study recruited Thai women aged 24–49 years old from eight factories between 2022 and 2025. Blood samples were collected for complete blood count and iron status analysis. Anemia was defined as hemoglobin concentrations <12 g/dL, while ID was identified using a zinc protoporphyrin (ZPP) level >40 µmol/mol or serum ferritin (SF) level <30 µg/L. Weight and height were measured, and BMI was calculated according to WHO international standards. Binary regression analysis was performed to investigate the association between anemia and BMI.
RESULTS
In total, 1,450 female Thai workers aged 37.5±7.7 years were recruited into the study. The overall prevalence of anemia was 31.4%. Based on ZPP or SF cutoff, 12.1 % of ID and 11.7% of IDA were reported, respectively. Among 302 women with available BMI data, almost half of participants (45.7%) are being overweight or having obesity. There is no significant relationship between anemia and BMI among these women (OR=0.96; 95% CI: 0.61–1.51, P=0.86).
CONCLUSIONS
Anemia and obesity are still prevalent among WRA in Thailand. Although, there is no significant association between anemia and obesity in these populations, effective policies including the practical guidelines are required for combating both anemia and obesity problems.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_208

RELATIONSHIP BETWEEN SKIN AGES LEVELS AND LIFESTYLE HABITS OF HEALTHY PEOPLE LIVING IN MIYAZAKI PREFECTURE

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BACKGROUND AND OBJECTIVES
Extending healthy life expectancy is a major issue in Japan. Advanced glycation end products (AGEs) are thought to be one of the factors involved in the onset and progression of lifestyle-related diseases. Notably, one-third of the AGEs in the body are derived from food, and to control these AGEs, it is important to cultivate good eating habits from childhood. Carotenoids are antioxidants, but in recent years, vegetable intake has been insufficient, affecting anti-glycation and anti-oxidation. This study aimed to clarify the relationship between skin AGE levels, skin carotenoid levels, and eating habits.
METHODS
From September 2023 to November 2024, we examined 106 men (aged 5–54) and 205 women (aged 5–58) living in Miyazaki. Skin AGE levels were determined by evaluating skin auto-fluorescence with an AGE Reader (DiagnOptics). We also measured optical skin carotenoid levels with Veggie Meter® (Longevity Link Corporation) and conducted a self-administered food frequency questionnaire survey. Lifestyle and dietary surveys were also conducted for junior high school students (aged 12–13).
RESULTS
Skin AGEs levels were significantly and positively correlated with age and body mass index for both men and women. For women, a significant negative correlation was found with veggie score. Regarding skin AGEs levels and dietary intake, a positive and significant correlation was found with sugar and sweetener intake for both men and women. For women, a positive correlation was also noted with legume intake. However, significant and negative correlations were found with milk and confectionery intake for both men and women. Fruit intake also showed a significant, negative correlation among women. Junior high school students (12–13 years old) were divided into low and high AGEs groups, with the former going to bed earlier and sleeping longer on weekdays. In terms of dietary habits, the low AGEs group was more satisfied with their meals, ate breakfast more often with their families, and had a higher sense of self-efficacy in being able to eat healthier food.
CONCLUSIONS
The RESULTS suggest that dietary habits and lifestyle guidance that do not raise AGE levels from childhood are important for extending healthy life expectancy.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_209

PREVALENCE OF EATING DISORDERS AND ASSOCIATED COMORBIDITIES: PREVALENCE SURVERY IN MOROCCO

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BACKGROUND AND OBJECTIVES
Eating Disorders (ED) are a significant public health issue, as recognized by the World Health Organization (WHO). While initially reported in Western populations, recent studies have shown that ED also affects non-Western countries, including Morocco. These disorders can severely impact an individual's physical and mental health, yet they often remain hidden from family members and are rarely addressed with healthcare providers. Objective: To assess the prevalence of ED among patients attending various medical consultations in private practices in Morocco and to identify associated factors.
METHODS
This study included 59 patients from three private clinics (Endocrinology, General Medicine, and Nutrition) in Morocco. Participants completed anonymous self-report questionnaires that collected sociodemographic, medical, and dietary information. Three validated ED screening tools were used: SCOFF, EAT-40, and Test-Bulit. Data collection took place between January and April 2017. Statistical analysis was conducted using SPSS and XL STAT software, with a p-value of <0.05 considered statistically significant.
RESULTS
The study found that more than 50% of the participants showed signs of ED. Prevalence was higher in patients with medical conditions, with 32.15% identified by EAT-40 and 48.04% by Test-Bulit. Among diabetic patients, 32.03% showed signs of ED.
CONCLUSIONS
This study highlights the significant prevalence of ED in the patient sample, particularly among those with pre-existing conditions like diabetes. The findings underscore the need for multidisciplinary care and further research to improve prevention and early intervention strategies for ED in Morocco.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_210

NUTRITION AND PUBLIC HEALTH INDICATORS ASSOCIATED WITH EARLY CHILDHOOD DEVELOPMENT AMONG CHILDREN AGED 19-36 MONTHS: A SECONDARY ANALYSIS OF THE 2022 DEMOGRAPHIC AND HEALTH SURVEY

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BACKGROUND AND OBJECTIVES
More than 50% of children in the country fail to achieve developmental milestones. However, the available information has not been integrated to measure early childhood development (ECD) and its associated indicators, making it challenging to guide nutrition and public health interventions. This study aimed to determine the association between nutritional and public health indicators with ECD among children aged 19-36 months.
METHODS
A cross-sectional analytical study with data from 4024 children among 19-36 months, obtained from the 2022 Demographic and Family Health Survey (ENDES), conducted at the national level. ECD was evaluated according to the achievement of at least 3 development components: literacy or cognitive language, physical development, socio-emotional development, and learning. Nutrition and public health indicators are included in four groups: maternal health, child health and nutrition, child care and life conditions, considering the nurturing care framework. A generalized linear model with a Poisson family was used to report associations through prevalence ratios.
RESULTS
The prevalence of inadequate ECD was 49.6% among children aged 19-23 months and 10.6% among those aged 24-36 months. Adequate dietary diversity reduced the probability of inadequate ECD among children aged 19-23 months (*aPR: 0.81, 95%CI : 0.67-0.97*). In contrast, factors such as the absence of skin-to-skin contact (*aPR: 1.19, 95%CI: 1.03-1.38)*, living in a household inadequate flooring material (*aPR: 1.21, 95%CI: 1.05-1.39)*, and the mother approving some form of violence against women (*aPR: 1.51, 95%CI: 1.11-2.05)* increased the probability of inadequate ECD. Among children aged 24-36 inadequate ECD was associated with the mother expressing a desire to delay pregnancy (*aPR: 1.41, 95%CI: 1.05-1.88*) and not receiving iron supplements during pregnancy (*aPR: 2.18, 95%CI : 1.33-3.60*).https://qr.link/Wkxd6a
CONCLUSIONS
There are nutritional and public health indicators associated with ECD among children aged 19-36 months in the country; therefore, it is essential to address these and leverage opportunities to strengthen protective, thereby supporting the achieving of the objectives outlined in the national ECD policy.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_215

A CASE STUDY FOR CHANGE: ARE WE LEAVING BEHIND RURAL INDIGENOUS CHILDREN IN SOUTH AMERICA?

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BACKGROUND AND OBJECTIVES
This descriptive, cross-sectional case study brings awareness to the critical data gaps in the nutritional health of children in remote indigenous communities of Peru, where access to healthcare and government resources is scarce. We assessed the nutritional status, feeding practices, and food environment of a small group of children aged 3-6 years attending a public pre-kindergarten program (PRONOEI) in the Maras District of Cusco. While malnutrition and anemia surveillance programs exist in Latin America, their reach is limited in remote regions. Even within rural departments, data collection and resources are concentrated in 'the urban areas of rural departments' (Mujica-Coopman et al., 2015). Despite limited data, the risks are significant: children with multiple forms of malnutrition face a 4 to 12 times higher risk of mortality (McDonald et al., 2013). Peru also has one of the highest rates of childhood anemia in Latin America, with national prevalence unchanged in the last decade, from 32.9% in 2012 to 33.6% in 2022 (INEI).
METHODS
Study assessed hemoglobin levels for anemia adjusted for altitude, collected anthropometric data, conducted dietary surveys, and observed local food environments.
RESULTS
A significant coexistence of nutritional deficiencies and excesses was observed, with 58% of children being anemic (71.4% boys, 40% girls), one-third experiencing stunting (predominantly girls) and another third showing excess weight. Limited iron intake, insufficient nutrient-dense foods, and a lack of dietary diversity was observed.
CONCLUSIONS
The issue and gravity of malnutrition among children in rural and indigenous communities are complex and remain largely underexplored. Our study examines a range of cultural and environmental factors, as well as the coexistence of multiple forms of malnutrition. There is a clear need for more detailed, context-specific research to complement national and international surveys. Building on this work, we plan to conduct follow-up research focused on improving water access in these communities, with the aim of improving health, food security, and income generation. We emphasize the critical need for inclusive, representative data collection and for policies that address the unique challenges faced by remote indigenous populations. Even if surveyors reached the 'rural areas of rural districts,' they may encounter region-specific challenges, such as high illiteracy rates. Alternative approaches--such as descriptive case studies or fingerprint identification for data collection--could be explored to help overcome barriers to engagement and effective intervention.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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STUDY OF THE RELATIONSHIP BETWEEN PERCEPTION OF THE NATIONAL PLAN OF ACTION ON NUTRITION PHASE 1 (B.E. 2566 – 2570) AND THE PLAN IMPLEMENTATION BY ORGANIZATION RESPONSIBLE FOR KEY PROJECTS

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BACKGROUND AND OBJECTIVES
This study aims to assess the level of perception and implementation of the The National Plan of Action on Nutrition Phase 1 (B.E. 2566 – 2570) (NPAN) among agencies responsible for key projects and analyze the relationship between the perception of the plan and its implementation.
METHODS
A mixed-methods approach comprising quantitative research through questionnaires completed by 59 participants and qualitative research through in-depth interviews with seven representatives from agencies responsible for implementing key projects.
RESULTS
The study sample predominantly comprised officers from government agencies (88.1%), with the majority being civil servants (64.4%) and operational staff (52.5%). Most respondents had 1–5 years of work experience (37.3%). The overall perception of the NPAN was rated as high ($\bar{x}$=3.707, SD=0.470), while the overall implementation was assessed at a moderate level ($\bar{x}$=3.450, SD=0.836). A significant positive correlation was found between the perception and implementation of the NPAN (r=0.456, p=0.000). However, further analysis revealed an inverse relationship between the perception of nutritional problems and the adequacy of resources for implementation. This observation aligns with the 'issue attention cycle,' which posits that public interest in a given issue tends to peak initially but gradually declines over time due to the complexity of the problem. As a result, resources are often reallocated to address emerging priorities over time. Implementation challenges were also identified, including insufficient communication, limited budgets, and a shortage of dedicated nutrition personnel at the local level. To address these challenges and improve the NPAN, the study recommends proactive communication strategies utilizing diverse media. Building cross-sectoral partnerships with private sectors, educational institutions, and community networks is essential to fostering collaboration. Awareness-raising activities should be organized to deepen understanding and encourage active participation. Lastly, disseminating information and training for practitioners should leverage digital media and online platforms to ensure effective communication.
CONCLUSIONS
This study emphasizes the importance of improving communication strategies and allocating resources more effectively to strengthen the implementation of the NPAN. The findings provide a foundation for revising and enhancing the plan during the latter half of its period (B.E.2569–2570).
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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ASSOCIATION BETWEEN DIETARY FACTORS AND OVERWEIGHT/OBESITY AMONG MOTHERS AND THEIR CHILDREN IN URBAN AND RURAL MALAWI

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BACKGROUND AND OBJECTIVES
To prevent increasing childhood obesity and non-communicable diseases (NCDs) among women in sub-Saharan Africa, as well as to understand the factors of food consumption in the population, this study aimed to identify the relationship between overweight/obesity and dietary intake among children and mothers in urban and rural Malawi.
METHODS
We conducted anthropometric measurements (height, weight and MUAC) for children and mothers, blood pressure measurements for mothers, questionnaire interview with mothers with children aged 2-4.9 years in Lilongwe City (an urban area) and Mzimba District North (a rural area). Dietary survey was consisted of the 24-hour recall method and food frequency questionnaires. Participants' mothers were classified as overweight/obese (BMI≥25) and normal weight (18.5≦BMI<25) and children were classified into two groups; “high weight” and “low weight”. Nutrients, food consumption, food frequency questionnaires, MDDW, MDD, and questions at $p<0.01$ in the t-test for independent samples were performed a logistic regression analysis.
RESULTS
Of 229 pairs, 200 pairs mother and children were analyzed in this study. Consequently, 37.5% (urban 34.0% and rural 40.2%) of mothers were classified as obese (BMI≥25), and 4.5% (urban 8.0% and rural 1.8%) of children were classified as overweight (WHZ≥3). According to our logistic regression analyses, fats and egg intake were positively associated with obesity in urban mothers, while carbohydrates (nsima) intake, number of deliveries, family history of NCDs, and increased income were positively associated with obesity in rural mothers. On the other hand, meat and fish intake were negatively associated with obesity in urban mothers, while rice, fats, and egg intake, and children’s diverse food intake (MDD>5) were negatively associated with obesity in rural mothers. As for the children, those who were classified as wasting (WHZ<-2) were excluded. It was found that green leafy vegetable intake were positively associated with child weight gain both mothers and children in urban area.
CONCLUSIONS
The dietary factors related to the mother’s obesity differed in urban and rural areas. In rural area, the dietary diversity of children was a determinant to prevent obesity among mothers. To prevent childhood obesity and NCDs in Malawi, they are necessary to through the life course appropriate approach considering the areas and targets, and child nutrition education for mothers may prevent mothers' NCDs as well as child growth and health.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_220

CURRENT STATE OF NORMAL WEIGHT OBESITY IN WOMEN AND DIETARY LIFESTYLE RECOMMENDATIONS

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BACKGROUND AND OBJECTIVES
Many women with high body fat percentages, referred to as Normal Weight Obesity（NWO）, are not classified as obese based on BMI or waist circumference and are often excluded from lifestyle improvement guidance. This study aimed to investigate the prevalence of NWO and its associated dietary challenges to support the prevention of cardiovascular diseases.
METHODS
A total of 471 women aged 40–74 years who underwent health checkups and body composition measurements in 2023 were divided into two groups: the normal group (BMI 18.5–<25, body fat <30%) and the NWO group (BMI 18.5–<25, body fat ≥30%). Anthropometric data, blood tests, body composition (InBody 470), dietary awareness, and food frequency surveys were analyzed.
RESULTS
Among the participants, 54.6% were classified as having NWO. Compared to the normal group, the NWO group exhibited higher body fat, visceral fat, waist-to-hip ratio, triglycerides (TG), and LDL cholesterol (LDL-C), as well as lower HDL cholesterol (HDL-C). They consumed more bread, noodles, beverages, pickled foods, vitamin B1, and salt. Despite recognizing themselves as “slightly overweight,” participants prioritized food preferences over health awareness and demonstrated limited knowledge about maintaining physical activity, with no significant differences in exercise habits. NWO individuals showed fat accumulation in the abdomen and hips, reduced lower limb muscle mass, and increased visceral fat, suggesting a pre-metabolic syndrome state. Weight control efforts often relied on dietary adjustments, highlighting concerns about imbalanced diets and inadequate health knowledge.
CONCLUSIONS
Early lifestyle intervention targeting NWO is essential to prevent metabolic syndrome, sarcopenic obesity, and cardiovascular diseases. Expanding health guidance to include individuals with NWO can enhance health literacy, promote proactive health behaviors, and support healthy aging.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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INTEGRATING NUTRITION EDUCATION IN PHARMACY CURRICULA: INSIGHTS FROM A STUDY ON KNOWLEDGE, ATTITUDES, AND CONSUMPTION OF NUTS AMONG SERBIAN STUDENTS

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BACKGROUND AND OBJECTIVES
Nuts are known for their health benefits, including reducing the risk of chronic diseases such as cardiovascular disease and diabetes. Nevertheless, their consumption remains below recommended levels worldwide. This study aimed to investigate the attitudes, knowledge and consumption habits of pharmacy and non-pharmacy students in Serbia regarding nuts, with a particular focus on the influence of nutrition education, which is an integral part of the pharmacy curriculum in Serbia, on the promotion of positive attitudes and dietary habits.
METHODS
A cross-sectional study was conducted using an online questionnaire distributed to pharmacy and non-pharmacy students in Serbia. The survey collected sociodemographic characteristics, attitudes, knowledge and consumption habits related to nuts. Statistical analyzes, including chi-square tests, were used to examine differences between pharmacy and non-pharmacy students and the influence of nutrition-related courses on responses.
RESULTS
Of the 509 respondents (382 pharmacy students and 127 non-pharmacy students), pharmacy students showed significantly higher knowledge of the health benefits of nuts, with a mean of 4.89 ± 2.4 (R: 0–11, Mdn: 5) for the group of students who successfully passed the exam, compared to the total sample 3.9 ± 2.5 (R: 0–11, Mdn: 4). For the 10 statements about the health benefits and nutritional importance of nuts, there was a statistically significant difference in attitudes between pharmacy students and non-pharmacy students. More than half of the respondents (57.8%) expressed a strong interest in additional information about nuts, with 27.5% of pharmacy students indicating that this topic is not adequately covered in nutrition-related courses. 81.7 of the students included nuts in their diet, with walnuts, almonds and hazelnuts being the most commonly consumed nuts. More than half of respondents (57.8%) expressed a strong interest in additional information about nuts, with 27.5% of pharmacy students stating that this topic is not adequately covered in nutrition-related courses.
CONCLUSIONS
Integrating comprehensive nutrition education into pharmacy curricula can potentially improve future pharmacists' ability to promote healthy dietary behaviours, including increased nut consumption. This study emphasises the need for targeted educational interventions to address existing knowledge gaps and strengthen the role of pharmacists in promoting healthy eating in the population.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_222

ECONOMIC BURDEN OF OBESITY IN HUNGARY ESTIMATION ABOUT OBESITY RELATED PUBLIC HEALTH CARE EXPENDITURES AND OUT OF POCKET PAYMENTS IN 2019 AND 2022

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BACKGROUND AND OBJECTIVES
Background. Obesity is an important threat to national and global public health in terms of prevalence and economic burden due to the obesity-related complications (ORCs) and morbidities.
Aim of this study is to calculate the obesity related public expenditures in Hungary, to estimate the expenses and contribution of patients in 2019 (before) and in 2022 (after) the covid-pandemic.
METHODS
Method. The National Health Insurance Fund is the only health-care financing agency in a single-payer social-insurance system in Hungary, managing all of the public payments. Expenditures related to the patients with obesity and more frequent co-morbidities were requested from the national database. Financing of the inpatient (hospital) and the outpatient (secondary or ambulatory care) providers, reimbursement for prescription of medicines and healing aids were collected. Lower and upper thresholds were estimated, representing the prevalence of the respective morbidities among obese persons. The upper values were used in the final estimation, because many of other obesity related morbidities and treatments were not included in the calculation.
RESULTS
RESULTS. Obesity-related morbidities represent 10-12 % of all cases in the public health care system. National public health care expenses could be about 144 Billion HUF (444 Million EUR) for 2019 and 133 Billion HUF (339 Million EUR). These sums represent 7-11% of the national spending for health care provision, without sick leave expenditures. The co-payment of patients was estimated 34 Billion HUF (104 Million EUR) and 43 Billion HUF (109 Million EUR), respectively. The public and individual expenditures together represents 0.3-0.4% of the Hungarian GDP.
This study presents whole national database which is appropriate for reliable calculation.
CONCLUSIONS
Reducing of high expenses could be possible by weight maintenance, preferable as early prevention, and weight reduction among persons living with obesity at individual level. Beside these, more efforts are needed in the education and public health policy.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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ADULT'S PRACTICES AND PERCEPTIONS ABOUT THE ORGANIZATIONAL FOOD ENVIRONMENT

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BACKGROUND AND OBJECTIVES

The global prevalence of obesity among adults has been increasing at an alarming rate in recent decades. The same is true in Chile, which faces a major problem related to the high prevalence of malnutrition and other non-communicable diseases. Considering that adults spend a large part of their day in the workplace or educational institutions, the Organizational Food Environment can play a strategic role in the health of adults, therefore, it is necessary to understand these environments. To describe the practices and perceptions of adults regarding the organizational food environment in their workplace or place of study.

METHODS

A non-experimental, cross-sectional study was conducted. Adults over 18 from randomly selected households in two districts of Santiago, Chile, participated. A short version of the NEMS-P questionnaire for Chile (NEMS-PCh) was applied, which included an assessment of the Organizational Food Environment. Items were reported using relative frequency and a weighted score was calculated to assess the obesogenicity of this environment. The more negative the score, the more obesogenic the environment. Software Stata v. 18.0 was used for the analyses.

RESULTS

400 participants answered the Organizational Food Environment section. Of these, 53.3% bring food from home and 46.7% buy their meals at or near their place of study or work. 73.3% believe that it is easy to find places to eat. 20.7% perceive that they can never find places with several menu options or healthy foods and 22.5% responded that it is always difficult to find healthy eating options. 18% believe that it is never easy to find fresh fruits and vegetables and 33.5% believe it is always more expensive to buy healthy options. The median score of the Organizational Food Environment was 2.39 points, 31% of the participants scored less than 0 (more obesogenic).

CONCLUSIONS

For a considerable part of the participants, the organizational food environment would not allow them to follow healthy eating patterns. Public policies aimed at improving access to and availability of healthy foods in work environments are necessary.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_224

ASSESSING DIETARY INTAKE AND NUTRITIONAL STATUS IN HUNGARIAN CHILDREN: PRELIMINARY FINDINGS AND FUTURE DIRECTIONS USING THE HEALTHY EATING INDEX

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BACKGROUND AND OBJECTIVES
The growing prevalence of childhood obesity is a major public health issue, posing serious risks to physical and psychological well-being. In Hungary, 23% of children aged 4–10 years are overweight or obese. This study aims to identify the economic, educational, regional determinants influencing nutritional status and dietary intake in children. It aims to use the Healthy Eating Index (HEI) to benchmark dietary quality against global standards and explore its associations to socioeconomic factors. No HEI data exists for Hungarian children, which could enhance global comparability and guide targeted interventions.The analysis of HEI data is ongoing and will be completed in time for presentation at the conference.
METHODS
Representative survey was conducted among 733 children aged 4–10 years in Hungary. Data collection included three-day dietary records, anthropometric measurements, questionnaires assessing physical activity, parental attitudes, socioeconomic status. Statistical analyses (ANOVA, Pearson correlation) were used to examine relationships between Body Mass Index (BMI), nutrient intake, physical activity, and socioeconomic variables. Ongoing HEI analyses will assess overall diet quality and its link to socioeconomic factors.
RESULTS
Preliminary findings indicate a higher prevalence of overweight and obesity in economically advantaged western regions and the capital. Children from higher-income households are significantly more likely to be overweight or obese. There is a positive correlation between BMI and energy intake. Obese children consumed more nutrients across food groups and engaged in 4.5 fewer hours of physical activity weekly compared to their peers. Maternal education level showed no significant association with BMI. Regional disparities were observed in some food group consumption, although overall nutrient intake was consistent nationally, including excessive fat and sugar, low dietary fiber, fruit, vegetable intake. Dietary awareness and level of education influenced food choices irrespective of income.
CONCLUSIONS
Findings emphasize the need to address regional, economic, educational inequalities in dietary behaviours and obesity rates among Hungarian children. The ongoing HEI will provide a comprehensive assessment of overall dietary quality. The country represents a unique intersection of Western and Eastern dietary patterns, and it offers a valuable perspective for understanding the role of socioeconomic and cultural factors in shaping dietary habits. This can contribute to the broader international dialogue on effective strategies for improving diet quality and preventing childhood obesity.
CONFLICTS OF INTERESTS
Project No. 2023-2.1.2-KDP-2023-00016 has been implemented with support from the Ministry of Culture and Innovation of Hungary, financed by the National Research, Development, and Innovation Fund under the KDP-2023 funding scheme.The collection and analysis of food diaries and questionnaires were sponsored by Nestlé Hungária Kft., where the presenter is employed full-time. The research was conducted in collaboration with the Hungarian Dietetic Association, InsightLab Ltd., and NutriComp LP. Further analyses and interpretations are being carried out as part of the PhD studies of the presenter.

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EPO5_225

QUALITY OF NUTRITION EDUCATION/COUNSELLING TOWARDS ANAEMIA PREVENTION AND CONTROL DURING PREGNANCY IN ETHIOPIA

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BACKGROUND AND OBJECTIVES
Anaemia during pregnancy was a major public health issue globally, especially in low- and middle-income countries like Ethiopia, despite the availability of preventive interventions. This highlighted potential gaps in implementation, particularly in the quality of nutrition counselling services. So, this study aimed to assess the quality of nutrition education services during pregnancy in relation to anaemia prevention and control in Ethiopia.
METHODS
The study was conducted from September 1 to 30, 2024, at public health facilities in the South Gondar districts and Debre Tabor Town Administration in Northwest Ethiopia. A total of 791 pregnant women were included in the study. Data were collected at the end of ANC services through exit interviews using a structured service quality (SERVQUAL) questionnaire administered via the Qualtrics survey tool (v2.57). The collected data were imported into Stata 17/MP for analysis. Descriptive analysis was performed, followed by multilevel linear regression to determine associations between independent variables and the quality of nutrition education or counselling. A p-value of ≤ 0.05 was used to determine statistical significance.
RESULTS
In this study, 791 pregnant women data were included into this study. Overall, the the quality of nutrition counselling for anaemia prevention was found to be low. Ordinal logistic regression analysis showed that healthcare providers' years of service (AOR = 0.89, 95% CI: 0.82, 0.97), effective communication with pregnant women (AOR = 3.87, 95% CI: 2.67, 5.63), use of visual aids (AOR = 3.99, 95% CI: 2.51, 6.38), and administrative roles were associated with the quality of nutrition counselling for anaemia prevention. Additionally, travel time to antenatal care facilities (AOR = 0.99, 95% CI: 0.98, 0.99) and quality nutrition services during pregnancy (AOR = 3.42, 95% CI: 2.35, 4.97) were significant factors.
CONCLUSIONS
The quality of nutrition education counselling services was low across all healthcare facilities. Factors related to pregnant women, infrastructure, and healthcare providers were linked to the quality of these services. Interventions targeting these factors are essential to mitigate the prevalence and impact of anaemia during pregnancy.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_226

FACTORS ASSOCIATED WITH THE PRESENCE OF HEALTH AND NUTRITION CLAIMS ON FOOD AND BEVERAGE PACKAGING SOLD IN THE BRAZILIAN FOOD RETAIL

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BACKGROUND AND OBJECTIVES
Aggressive and widespread marketing of unhealthy foods and beverages is recognized as a health risk factor, especially for children. Nutrition and health claims on food labeling can produce a “halo” effect, encouraging the purchase of products with excessive sugars, fats, and sodium. This study aimed to estimate the proportion of foods with health and nutrition claims, examine the association between claims and food categories, prices, brands, and critical nutrients, and assess compliance with Brazilian labeling legislation.
METHODS
This cross-sectional study used data from Mintel’s Global New Products Database. A total of 7,057 foods and beverages between 2018-2021 were analyzed. Health and nutrition claims on packaging were coded using protocols developed by The International Network for Food and Obesity/Noncommunicable Diseases Research, Monitoring and Action Support (INFORMAS). Associations between health and nutrition claims and price, brand, nutrition composition and food processing were examined using Poisson regression ($p < 0.05$).
RESULTS
Seventy-seven percent of the sample were ultra-processed foods (UPFs), which had a higher proportion of nutrition and health claims on their packaging. Non-carbonated sweetened beverages and dairy beverages had the highest proportions of packages featuring two or more health or nutrition claims on their labels (~20%). Among products with health claims, 10.7% were high in added sugars, 7.4% were high in sodium, and 7.8% were high in saturated fats. For products with nutrition claims, 32.1% were high in added sugars, 23.3% high in sodium, and 23.1% high in saturated fats. Private label products, which account for up to 80% of market sales, were significantly associated with a higher prevalence of health claims (adjusted PR 4.03, 95% CI 2.58; 6.29) and nutrition claims (adjusted PR 1.55, 95% CI 1.23; 1.96) in the food groups studied, regardless of the amounts of critical nutrients in excess, price, or degree of food processing.
CONCLUSIONS
Private label products and UPFs were associated with a high prevalence of the health and nutrition claims on packaging. A high proportion of products that exceed critical nutrients and still carry these claims, raising the question of whether in the future the presence of front-of-pack nutrition labelling could discourage the purchase of these products or whether these claims highlighting isolated nutrients will prevail.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_228

A RANDOMIZED CONTROL TRIAL TO ASSESS THE EFFECT OF COOKED MILLET-DIET ON HEMOGLOBIN AND OTHER MICRONUTRIENT STATUS AMONG ANEMIC WOMEN OF REPRODUCTIVE AGE

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BACKGROUND AND OBJECTIVES

Background: Iron deficiency Anemia and other micronutrient deficiencies among women of reproductive age is a significant public health concern in India with the prevalence exceeding 50%. The inclusion of micronutrient-rich millets in their habitual diet presents a sustainable strategy to improve micronutrient intake. This study aimed to evaluate the impact of millet-based recipes on hemoglobin levels and the overall micronutrient status of anemic women of reproductive age residing in Hyderabad, India.

METHODS

A cluster-randomized controlled trial was conducted on 822 women aged 17 to 22 years (diagnosed with mild to moderate anemia), enrolled in Government welfare residential degree colleges. Participants were randomly assigned to either the intervention or control group. The intervention group consumed millet-based meals incorporating pearl millet, finger millet, and foxtail millet for 4–5 months, while the control group continued their habitual diet. Venous blood samples were collected and Hemoglobin levels were assessed at three time points using a hematology autoanalyzer. Micronutrient levels were analyzed at both baseline and endpoint using the Abbott i-STAT 1000 autoanalyzer.

RESULTS

The baseline characteristics were comparable between the two groups. The mean duration of intervention was 128 ± 11 days and the average millet intake was 50 g/day. Hemoglobin levels showed a significant improvement in the intervention group (10.37 to 10.48 g/dL), whereas a decline was observed in the control group (10.45 to 10.29 g/dL), resulting in a statistically significant difference between the groups. The trajectory of mean hemoglobin levels over time demonstrated a significantly favorable trend in the intervention group compared to the control group ($p < 0.044$). Additionally, mean changes from baseline for folate and vitamin B12 levels were greater in the intervention group than in the control group. However, changes in other micronutrients such as ferritin, zinc, calcium, vitamin D, were comparable between the two groups from baseline to endline.

CONCLUSIONS

The Millet-based dietary intervention significantly improved hemoglobin, folate, and vitamin B12 levels among anemic women of reproductive age. However, no substantial changes were observed in other micronutrients. These findings highlight the potential of millets as a sustainable dietary strategy for anemia management. Further research is needed to explore long-term benefits and integration into public health programs.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_230

PARENTS' PERCEPTIONS OF SCHOOL MEAL PROVISION AND THE SCHOOL CANTEEN ENVIRONMENT IN NORTHERN IRELAND: THE CANTEEN STUDY

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BACKGROUND AND OBJECTIVES
School meals play a crucial role in promoting healthy eating habits among secondary school pupils. Understanding parents' perceptions of school meal provision and the wider school environment is important to consider when investigating school meal uptake and school food policy. This research explored parents' perceptions of secondary school pupils towards school meal provision and the canteen environment.
METHODS
The research used online survey responses completed by 327 parents of Year 8 & Year 11 pupils, recruited from 17 secondary schools in Northern Ireland, as part of the CANTEEN study. CANTEEN is an ongoing cross-sectional study investigating Free School Meals, diet quality and food insecurity in UK secondary schools. The online parent survey included questions about perceptions of school food and the canteen environment, with responses measured using a 5-point Likert scale. Descriptive statistics were used for data analysis.
RESULTS
Overall, the majority of parents perceived school food and the canteen environment positively. Over half (55%) of parents agreed or strongly agreed, that buying food at school was the most convenient and easiest option for their child, with 73% of parents agreeing/ strongly agreeing, that the way their child bought their lunch was straightforward and efficient. Despite this, less than a quarter of parents (23%) felt that pupils were given enough time to buy their lunch without feeling rushed. Regarding the canteen environment, most parents considered the dining areas to be clean (57% agreed or strongly agreed), provided adequate space to eat (62%) and that their child was able to eat with their friends in the dining area (81%). Few parents (23%) perceived their child's friends to influence their food choices at school. Parents held less favourable views regarding the canteen menu and food pricing. Less than one third (27%) of parents agreed or strongly agreed that the food offered in the canteen was clearly priced, and that the school menu was easily available for pupils to view in advance of going to the canteen (31%) while just over one third (34%) viewed the food and drinks offered to be good value for money. Over half of parents (60%) agreed or strongly agreed that pupils had easy access to free drinking water.
CONCLUSIONS
It is important to explore parents' perceptions of school food and the canteen environment to understand what factors affect school meal uptake and to enable school policy makers to make informed decisions towards improving food provision for secondary school pupils.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_231

SCHOOL HEALTH SERVICES, HEALTHFUL SCHOOL ENVIRONMENT, AND DIETARY DIVERSITY AMONG CHILDREN WITH AND WITHOUT SCHOOL FEEDING PROGRAMS IN OSOGBO AND OGBOMOSO, NIGERIA

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BACKGROUND AND OBJECTIVES
School-age children spend approximately 6–7 hours in school daily, making the quality of school health services (SHS) and the healthful school environment (HSE) critical to their overall health and well-being. Regular monitoring and evaluation of these factors are essential to prevent infections, malnutrition, and other health issues. Dietary diversity (DD) is crucial for balanced nutrition, preventing malnutrition, and supporting children's learning, cognition, and physical development, enabling full participation in education. The study investigated SHS, HSE and DD of school children with and without school feeding programs.
METHODS
This study employed a comparative cross-sectional design to examine schools participating in school feeding program (Osogbo) and schools not participating (Ogbomoso North). A total of 350 students were selected using convenience sampling. Data were collected through the School Health Evaluation Questionnaire to assess SHS, HSE and the Minimum Dietary Diversity Score (MDDS) questionnaire to evaluate dietary diversity among school children.
RESULTS
350 schoolchildren (mean age 10.17 ± 2.17 years; 51.14% male, 48.86% female) participated in the study. Banana consumption was higher in Ogbomoso (30.40%) than Osogbo (11.00%), with 75.14% overall not consuming bananas (p=0.000). Mango consumption was very low (1.14%) but differed significantly (p=0.039). Egg consumption was similar (15.43%, p=0.640), while fish (p=0.000) and soft drink consumption (p=0.009) were significantly higher in Ogbomoso, highlighting differences in dietary habits across locations.
Our investigation into school health and hygiene facilities highlighted significant gaps, with most schools lacking health committees, though Osogbo showed a slight advantage (p=0.147). First aid box contents varied, with ORS availability notably lower in Ogbomoso (20%) than Osogbo (100%) (p=0.147). Boreholes were the main water source in both locations (p=0.495). Osogbo schools had significantly better toilet facilities (p=0.030), while waste disposal methods were comparable (p=0.103). Anthropometric data revealed a mean BMI of 15.50 ± 1.88, height of 1.33 ± 0.12 m, and weight of 27.63 ± 6.66 kg. These findings underscore the need for improved school health interventions.
CONCLUSIONS
Osogbo, with a school feeding program, had better health environments, including more health committees, improved toilets, and 100% ORS availability, compared to Ogbomoso. Addressing gaps in dietary diversity, enhance school facilities, and sanitation is crucial.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_232

ASSOCIATION BETWEEN THE FOOD ENVIRONMENT OF BRAZILIAN PUBLIC AND PRIVATE SCHOOLS AND THE CONSUMPTION OF ULTRA-PROCESSED FOODS: ANALYSIS OF THE NATIONAL STUDENT HEALTH SURVEY (PENSE) 2019

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BACKGROUND AND OBJECTIVES
The school food environment can influence the eating habits, dietary practices and nutritional status of adolescents in a positive or negative manner depending on the foods available in this context. The presence of canteens and alternative points of sale of food items has been associated with a worse quality of food for students, represented by the highest consumption of unhealthy foods which are associated with obesity. Thus, this study aims to assess the association between the school food environment and the consumption of ultra-processed foods by Brazilian adolescents.
METHODS
Data from Brazil's 2019 National Student Health Survey, a school-based survey, were used. The sample consisted of 158,816 students aged 13 to 17 years enrolled in public and private schools. Food consumption (outcome) was assessed by self-reported consumption of 13 ultra-processed foods on the previous day **(1)**. The sum of the reported items generated a score. The school food environment (exposure) was assessed by the adapted indicator “Food and beverages availability” in the school food environment, which considers the presence of the canteen and alternative points of sale and the availability of eight food items in each of these places, which also generated a score **(2)**. Multilevel Logistic Regression Models stratified by type of school (private or public) adjusted by sociodemographic variables were used to assess the association between high consumption of ultra-processed foods (score ≥ 5) and the school environment score.
RESULTS
As for the consumption of ultra-processed foods, adolescents reported an average consumption on the previous day of approximately 4.3 food items, with no significant differences between public and private school students. About 45% of the students showed high consumption of ultra-processed food (score equal to or greater than 5). Students from public schools (OR: 0.93; 95% CI 0.90; 0.96) and private schools (OR: 0.94; 95% CI 0.90; 0.98) enrolled in schools that are in the highest quartile for the food and beverage availability score (≥score 14) showed lower odds of high consumption of ultra-processed foods.
CONCLUSIONS
A healthier school food environment, with a greater presence of fresh or minimally processed foods and a lower supply of ultra-processed foods, increases the quality of food, reduces the consumption of ultra-processed foods, and can contribute to an adequate nutritional status.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_233

WHAT IS IN PERUVIAN PRESCHOOLERS' LUNCHBOXES AND HOW DOES IT ASSOCIATE TO NUTRITIONAL STATUS?

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BACKGROUND AND OBJECTIVES
The school lunch box is a key opportunity to promote healthy eating habits and should provide between 10-15% of the Estimated Energy Requirement (EER). Excessive caloric intake from school lunches could be associated with overweight and obesity. This study evaluated the association between the caloric intake of the lunch box and the nutritional status in Peruvian preschoolers.
METHODS
A random sample of 67 preschoolers' lunchboxes from a kindergarten in Lima city were collected to evaluate the foods contained. The foods were weighed and classified according to the NOVA food classification system and by food group. We also use the nutritional labeling to evaluate the calories in the ultra-processed foods. Caloric intake was estimated by calculating each child's EER. To assess the nutritional status, we used the World Health Organization (WHO) Toolkit for Child Growth Standards. We evaluated Body Mass Index for Age (BMI for age) and Height for Age. A descriptive and bivariate analysis with Chi-square was conducted to evaluate the association between caloric intake and nutritional status, using STATA 16.
RESULTS
According to caloric intake, 62.7% of the lunchboxes provided more than 15% of the EER; 23.9% provided less than 10%, and 13.4% provided between 10-15%. According to the NOVA system, 74.6% contained minimally processed foods, 49.3% processed foods, and 52.2% ultraprocessed foods. Regarding food groups, fruits, especially bananas, tangerines, and apples, were the most commonly reported, followed by cereals, with bread being the most common within this group. Only one lunchbox included vegetables (broccoli). Among ultraprocessed foods, the most common were sweetened yogurt, fruit nectar, sweetened cereals, potato chips, and cookies. 92.5% of the children had normal height, and 7.5% had short stature. Based on BMI, 59.7% had a normal nutritional status, 19.4% were at risk of overweight, 13.4% were overweight, and 7.5% were obese. No association was found between the caloric intake of the lunchboxes and nutritional status.
CONCLUSIONS
No association was found between the caloric intake of the lunchbox and nutritional status. The presence of more than half of the lunchboxes containing ultraprocessed foods highlights the need to implement nutritional education programs on healthy lunchboxes and eating habits, aimed at parents and teachers.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_234

PREGNANCY AND NEONATAL OUTCOMES AFTER BARIATRIC SURGERY

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BACKGROUND AND OBJECTIVES

Bariatric surgery (BS) is mostly performed in women of childbearing age. This study examines maternal and neonatal outcomes of post-BS pregnancies and their influencing factors.

METHODS

We included all post-BS pregnancies in France from 2013 to 2022, using a nationwide database. We compared maternal and neonatal outcomes of 55,941 post-BS pregnancies with controls matched on delivery date, parity, age, obesity, hypertension, diabetes and socio-economic status. Additionally, we compared 11,777 post-BS pregnancies with pre-BS pregnancy.

RESULTS

Post-BS pregnancies showed reduced risks of gestational hypertension (OR 0.57 [0.53-0.62]), preeclampsia (OR 0.59 [0.55-0.64]), and gestational diabetes (OR 0.64 [0.62-0.66]) compared with controls and with pre-BS pregnancies. Small-for-gestational age (SGA) was increased (OR 1.74 [1.68-1.79] compared to controls). Prematurity was increased (OR 1.27 [1.22-1.31]) compared to controls, but not compared to pre-BS pregnancies (OR 0.95 [0.85-1.06]). There was an increased risk of stillbirth (OR 1.2 [1.06-1.35]) mediated by SGA and of perinatal death (OR 1.5 [1.13-1.99]) mediated by both prematurity and SGA. SGA risk was higher if the interval between BS and pregnancy was under 12 months, with gastric bypass and malnutrition. Prematurity risk was higher with pregnancy occurring under 12 months post-BS and malnutrition. Greater protection against gestational hypertension and preeclampsia was observed with gastric bypass, pre-BS BMI over 50 kg/m², and intervals under 5 years between BS and pregnancy.

CONCLUSIONS

BS is associated with reduced risk of maternal adverse outcomes during pregnancy but increased risk of neonatal adverse events. Post-BS pregnancies should be considered high-risk, requiring close nutritional and obstetrical monitoring.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_235

THE IMPACTS OF THE UNIVERSAL "NUTRITION" AND HEALTH COVERAGE THROUGH SUSTAINABLE SYSTEMS FOR NUTRITION IMPROVEMENT INTERVENTION PROJECT IN GHANA

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BACKGROUND AND OBJECTIVES
Ghana Health Service, one Japanese public foundation, the Ajinomoto Foundation/the KOKO Plus Foundation, and two private companies, NEC and Sysmex, implemented a Public-Private Partnership and multisectoral project for nutrition improvement in collaboration with the World Food Programme in Ghana (the Project) in line with the initiative of the African Health and Wellbeing Initiative between Ghanian and Japanese governments. The Project introduced information and communication technology (ICT) to health facilities in a target district. A job-aid application has been developed to facilitate maternal and child health and nutrition service delivery, especially supporting the nutrition counseling service provision by showing standardized questions, basic records, and alarming risk cases in line with the algorithm of nutrition counseling. This study aims to assess the impact of the application introduction in delivering standardized nutrition counseling.
METHODS
The study used a quasi-experimental approach called difference-in-differences to compare outcome changes over time between an intervention district and a control district. The study collected data from cross sectional surveys conducted before and after the intervention in both the intervention and control districts. To assess whether standardized nutrition counseling was provided with the job-aid application, the records of the nutrition counseling component in the Maternal and Child Health Record Book were checked. Additionally, health workers were asked whether they were confident in providing nutrition counseling to clients and using the nutrition counseling algorithm.
RESULTS
The recording of the nutrition counseling significantly improved in the intervention district. Each component of the nutrition counseling, assessment, analysis, and action was appropriately recorded. Also, the health workers were more confident in using the algorithm of nutrition counseling in the intervention district than in the control district.
CONCLUSIONS
The study shows that the introduction of the job-aid application improved the provision of standardized nutrition counseling.
CONFLICTS OF INTERESTS
The Project was funded by the World Food Program and all the authors are the Project member.

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EPO5_237

INFANT PASSIVE PROTECTION AGAINST CORONAVIRUS THROUGH EXCLUSIVE BREASTFEEDING: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
Vaccination against COVID-19 is essential to protect the population's health, preventing severe complications and hospitalizations and reducing morbimortality rates associated with the disease. The prevalence of vaccination against COVID-19 among pregnant women varied between countries.
Studies and guidelines from health organizations, such as the World Health Organization and the Centers for Disease Control and Prevention, highlighted the importance of maintaining breastfeeding even amid the health crisis. Furthermore, some studies have indicated that vaccination against COVID-19 elicits an effective immune response, manifested by the presence of anti-SARS-CoV-2 neutralizing antibodies in human milk.
However, no studies on this topic evaluated the percentage of antibodies generated by different vaccine technologies based on their potential neutralizing effects and COVID-19 variants. Therefore, the present study aims to determine the percentage and duration of neutralizing antibodies against the Omicron variant in human milk after vaccination against SARS-CoV-2, considering the three different vaccine technologies approved by the National Health Surveillance Agency (ANVISA) used in Brazil.

METHODS
A cross-sectional study was conducted with lactating women who completed the full vaccination schedule with available vaccines (AstraZeneca, Pfizer, CoronaVac, and Janssen). The participants were residents of Rio de Janeiro, and samples were collected between April and October 2022. Breast milk was analyzed to detect the presence of neutralizing antibodies using assays specific to the Omicron variant.
RESULTS
The RESULTS showed that, regardless of the vaccine technology used, all types of vaccines were effective in inducing neutralizing antibodies in breast milk. There was no significant difference between women who received two doses or three or more doses. Exclusive breastfeeding was a significant factor, showing higher percentages of neutralizing antibodies compared to women who did not exclusively breastfeed.
CONCLUSIONS
These findings reinforce the importance of breastfeeding as a strategy to provide passive protection to infants, especially in contexts where vaccination for children under six months is not recommended.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_238

HEALTH AND SUSTAINABILITY ASPECTS IN SCHOOL MEAL PROGRAMMES WORLDWIDE: A STATUS QUO ANALYSIS

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BACKGROUND AND OBJECTIVES
School meal programmes (SMP) contribute to various Sustainable Development Goals (SDGs), especially SDGs 2,3,4 and 5. However, they face various challenges that threaten their sustainability. This systematic review aimed to determine the health and sustainability aspects incorporated in SMP and compare disparities between the Global North and Global South.
METHODS
Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) and PROSPERO [CRD42023394523] were used. Specific search strategies for Web of Science and PubMed were developed. The terms of health and sustainability aspects (economic, social, environmental) were defined based on the FAO School Food and Nutrition Framework. The health aspect included nutrition education, dietary guidelines, deworming, prohibition of ultra-processed food, food safety, uptake of vegetables and fruits, and micronutrient supplementation. The economic aspect entailed job creation and Government budget allocation The social aspect entailed goals of the SMP, existence of government policies, coverage of SMP and parent involvement. The environmental aspect entailed locally-sourced food, school gardens, practising organic meals on some days, promoting seasonal food and fruits, plant-based menu, food wastage and Green House Gas Emissions. Only open access articles written in English and published between 1st January 2013 to 1st January 2023 were included.
RESULTS
A total of 227 studies were selected for a full reading. Of these, 94 met the eligibility criteria and were reviewed. Health and sustainability aspects were present in SMP in 32 countries worldwide. Most studies were recorded on the social aspect (n=76) covered by 27 countries. Sixty-three studies were recorded on health aspect covered in 30 countries. Seventeen studies were recorded under the economic aspect covered in 7 countries. The least studies were recorded under the environmental aspect (n=12) covered in 9 countries.
CONCLUSIONS
Variations in SMP among countries make comparison slightly difficult. Therefore, it will be easy to understand status quo of health and sustainability aspects of SMP if comparison is made based on continents, assuming that the names used for the SMP can be predicted and that they are implemented almost in a similar manner in the different countries. More research is needed on the environmental aspect in relation to the SMP. There is need for dialogue among stakeholders to improve SMP environmental and economic sustainability
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_239

PRE-GESTATIONAL OVERWEIGHT AND POLYUNSATURATED FATTY ACIDS IN HUMAN MILK: THEORETICAL CAUSALITY MODEL

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BACKGROUND AND OBJECTIVES
A number of studies have focused on the evaluation of the relationship between pre-pregnancy overweight and polyunsaturated fatty acids content in human milk. However, given the complexity of potentially confounding risk factors, the use of graphical tools is recommended to identify possible biases. This article aims to propose a theoretical model of causality using the Directed Acyclic Graph between pre-pregnancy overweight and polyunsaturated fatty acids content in human milk.
METHODS
An extensive literature review was performed to identify variables with causal relationships with exposure and/or outcome. The choice of variables for adjustment followed the graphic algorithm that comprises six criteria for selecting a minimum set of potentially confounding variables.
RESULTS
Socioeconomic conditions, interpartum interval, maternal age and food consumption pattern were the variables that would have to be adjusted in order to estimate the total effect of pre-pregnancy overweight on polyunsaturated fatty acids content in human milk. The minimum set of variables found in the present study can be used in the analysis of other studies that evaluate this association.
CONCLUSIONS
It is worth highlighting that the findings of this causal diagram are extremely important so that it can be used in other studies to evaluate the causal relationship between pre-gestational overweight and the omega6/omega3 ratio in human milk.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_245

INVESTIGATING NUTRITIONAL INTERVENTIONS FOR MUSCULOSKELETAL HEALTH IN OLDER ADULTS: WHOLE FOODS AND NOVEL PROTEIN SOLUTIONS

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BACKGROUND AND OBJECTIVES
In middle age, musculoskeletal health is commonly impacted by anabolic resistance, which RESULTS in loss of muscle mass (MM) and muscle strength (MS). Indeed, older adults need to consume higher protein intake to stimulate muscle protein synthesis (MPS) at the same level as younger adults. Milk protein supplementation has been well-studied in the last 25 years with a general conclusion on whey protein's effectiveness on MM and MS. Other types of interventions such as micronutrients or whole foods, have been investigated and positive impacts on muscular outcomes are identified. However, the combination of whole foods with added macronutrients or micronutrients has been relatively less explored in relation to muscular outcomes. We therefore carried out a scoping review to summarise current evidence of intervention studies using such foods or novel protein sources for muscle health.
METHODS
A scoping review was conducted to answer the following question: Does nutrient fortification of dairy (D) or plant-based dairy alternative (DA) products deliver additional benefits when compared with no nutrient addition to muscular outcomes in the elderly? Inclusion criteria were; Human study with mean population age > 45 years old; Healthy population or with sarcopenia diagnosed; D or DA products fortified with at least one nutrient; Muscular and/or inflammatory outcomes; Studies published between 2000-2024, available in English. In addition, a literature review was conducted to assess the impact of novel sources of protein, such as plant-based protein, or protein blends (animal/plant-based) on muscular outcomes in older adults.
RESULTS
The scoping review identified 14 interventional studies for inclusion. 12 studies were randomised controlled trials and 2 were studies without randomisation. Regarding the intervention, 6 studies had a food and exercise intervention, whereas 8 studies had a food-based intervention only. Detailed RESULTS and interpretation will be presented. Regarding intervention studies using new protein sources, current evidence indicates that mycoprotein has greater effect on the MPS rate when compared with milk protein. A protein blend of soy and whey has similar effects on MM and MS when compared with whey alone.
CONCLUSIONS
Current evidence indicates encouraging food-based solutions sed to improve muscular outcomes in older adults, but new types of protein supplementation (such as mycoproteins, protein blends) needs further research to identify optimal dose, frequency and mechanisms in the musculoskeletal system.
CONFLICTS OF INTERESTS
Lisa Arvieu receives an Australian Commonwealth Government Industry Linked PhD Scholarship which is co-funded by the Sanitarium Health Food Company. Sanitarium had no input into the RESULTS presented in this abstract.

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EPO5_246

RELATIONSHIP BETWEEN FOOD ENVIRONMENT, DIETARY DIVERSITY OF INFANT AND YOUNG CHILDREN IN RURAL AREA OF SENEGAL: THE IIMAANJE STUDY

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BACKGROUND AND OBJECTIVES
Child undernutrition continues to persist in sub-Saharan Africa, particularly among farming communities, despite the implementation of nutritional interventions in these communities. Poor quality diets among children is one of the key factors contributing to undernutrition and is driven by low food availability and access. In Senegal, farming communities rely mainly on home production and informal built food environments characterized by wet markets, street vendors, and small village stores. While access to these different food environments have important implication for infant and young child feeding, little is known about the relationship between food environments and dietary diversity in rural area in Senegal. This study aimed to assess the relation between food environment and dietary diversity among children in rural area of Senegal.

METHODS
This study combines data collected in a cluster randomized controlled trial conducted as part of the IIMAANJE study targeting children aged 6 to 23 months from 488 farm households in 3 regions (Thiès, Diourbel and Fatick) of Senegal and those from food environment. Sociodemographic and socioeconomic data were collected. Dietary diversity (DD) was assessed using 24-hour dietary recall. Data on food availability were collected in 85 informal food markets (IFM) (74 stores and 11 wet markets) through a mapping of the food environments. Seven food categories were established to form the Dietary Diversity of the Informal Market score (DDIMS), in accordance with the children's dietary diversity score.
RESULTS
The mean DDIMS was 6 ±2.7 food groups and the most common food groups sold were dairy products (100%), ultra-processed foods (100%) followed by starchy (95%) and legumes/nut (89%). Among children, 21% met DD and the most consumed food group were starchy staple (97%), while only 35% consumed vitamin A rich fruit/vegetables and 26% consumed foods of animal origin. Alongside, a high consumption of ultra-processed foods (61%) was observed. Furthermore, the consumption of nutrient-rich foods among children was positively associated with the two wealthiest quintiles ($p < 0.05$). The DDMIS is positively associated with the consumption of vitamin A-rich fruit and vegetables ($b=0.28$; $p < 0.05$) but not with DD due to production for own consumption by households.
CONCLUSIONS
Infant and young child feeding is inappropriate in this rural area. There is an urgent need to implement interventions to improve the affordability of healthy food in local markets.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_248

TIME SCARCITY AND ITS ASSOCIATION WITH DIETARY INTAKE: A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES
The price of food is a key factor in food choices, but time also influences decisions (1,2). Time scarcity, the perception of insufficient time for daily tasks, may shape eating behaviours. This scoping review aimed to investigate the link between time scarcity and dietary intake, including nutrient intake, diet quality, food choices, and dietary patterns.
METHODS
A comprehensive literature search was conducted in Medline, Scopus, Embase and through manual searches up to December 2024. Eligible studies measured time scarcity (via questionnaires or working hours) and diet. Extracted data included study location, sample size, age range, and methods for assessing time scarcity and diet. The review adhered to PRISMA guidelines.
RESULTS
From the literature search, 13 studies were included (11 cross-sectional and 2 longitudinal). Diet outcomes encompassed fruit/vegetable intake (7 studies), out-of-home food purchases (7 studies), highly processed food consumption (4 studies), diet quality indices (4 studies), meal quality (3), and nutrient intake (3 studies). Dietary assessment methods included food frequency questionnaires (4 studies), diet recalls (2 studies), food records/diaries (2), food expenditure diaries (1), and other self-report questionnaires (4 studies). Time scarcity was assessed using working hours as a proxy measure in 8 studies. Increased time scarcity was associated with modest reductions in fruit and vegetable intake (6 out of 7 studies) and greater out-of-home food purchases (6 out of 7 studies). All studies examining diet quality (n=4) reported negative associations with longer working hours. Findings on nutrient intakes were inconsistent. Few studies detailed specific food items.
CONCLUSIONS
Time scarcity negatively influences dietary behaviors, including reduced fruit/vegetable intake and increased consumption of out-of-home and processed foods. However, most studies were cross-sectional, with limited evidence on nutrient intakes. Future research should employ validated dietary assessment tools and standardised measures of time scarcity, and explore the mediating role of income.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_249

HIGHER CONSUMPTION OF BURGERS AND/OR PROCESSED MEATS DURING CHILDHOOD INCREASES THE RISK OF OBESITY IN BRAZILIAN ADOLESCENTS

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BACKGROUND AND OBJECTIVES
Obesity has been rising globally, driven by factors such as increased consumption of ultra-processed foods [UPF]. Few longitudinal studies have assessed this relationship in pediatric populations. Therefore, we aimed to evaluate the long-term effect of UPF consumption and its subgroups during childhood on the risk of obesity in Brazilian adolescents.
METHODS
This prospective cohort study included children aged 8–9 years from Viçosa, Minas Gerais, Brazil, assessed at baseline (2015/2016; n=319) and followed up between 15- and 18-year-old (2022/2024). Obesity was defined as BMI-for-age z-scores ≥2 (de Onis et al., 2007). UPF consumption, assessed according to the NOVA classification (Monteiro et al., 2019), was also analyzed in subgroups: 1. burgers and/or processed meats (ham, mortadella, salami, sausage, and hot dogs); 2. sugar-sweetened beverages; 3. instant noodles, packaged snacks, or crackers; and 4. stuffed cookies, sweets, or treats (Brazilian Ministry of Health, 2015). The caloric contributions of UPF and its subgroups (%) were estimated using three 24-hour dietary recalls. Poisson regression with robust variance estimated the relative risk [RR] with 95% CI, adjusted for age, sex, per capita income, and screen time, with α=0.05. This study was approved by the Human Research Ethics Committee.
RESULTS
After 7.8 ± 0.5 years of follow-up, 234 adolescents (53.9% female, 16.3 ± 0.8 years old) were evaluated, with a 26.6% loss (n=85). The obesity incidence in adolescence was 3% (7 new cases). In childhood, the caloric contribution was 44.9 ± 14.5% for UPF; 11.4 ± 10.8% for stuffed cookies, sweets, or treats; 4.6 ± 3.9% for sugar-sweetened beverages; 4.0 ± 6.0% for instant noodles, packaged snacks, or crackers; and 2.9 ± 4.0% for burgers and/or processed meats. Higher consumption of burgers and/or processed meats during childhood increased the risk of obesity in adolescence by 12% (RR: 1.12; 95% CI: 1.01; 1.25). No associations were found for other UPF subgroups or overall UPF.
CONCLUSIONS
Burgers and processed meats have shown long-term effects on increased obesity risk in Brazilian adolescents and should be monitored from an early age by health professionals and families.
Financial support: CNPq (processes no. 478910/2013-4, 407547/2012-6, and 150537/2023-9); FAPEMIG (processes no. APQ-02979-16, APQ-02793-21, and BPD-00839-22); and CAPES (code 001).
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_250

NUTRIMETRY TO COMPARE PREVALENCE OF SHORT STATURE IN CHILDREN FROM 0 TO 36 MONTHS IN RURAL AND URBAN LOCATIONS IN THE STATE OF CAMPECHE, MEXICO

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BACKGROUND AND OBJECTIVES

Based on WHA 65.6, whose goal is to reduce stunting by 40% by 2025, Nutrimetry allows us to compare prevalence by risk group in rural and urban locations in Campeche, Mexico.

The objective is to show with Nutrimetry the differences between prevalence of short stature in urban and rural locations.

METHODS

Nutrimetry crossing variables length/age and weight/height/age with z score provides risk groups to construct the prevalence of short stature. 150 children measured in Tenabo rural community with 2014 prevalences at ages 0 to 36 months, compared to 107 children in Sascalum urban community in Campeche, Mexico with 2024 prevalences

RESULTS

In 2014 in Tenabo risk group 1(2.66%), 4(8%), 7(0%). Prevalence 10.66%.

In 2024 in Sascalum, Campeche the risk group 1(3.74%), 4(4%), 7(4%). Prevalence 10.66%.

The prevalence of short stature in Tenabo 2014 was 10.66% and was below the national average, which was 13.6% in ENSANUT 2012. The prevalence of short stature in Sascalum Campeche 2024 was 10.66% and was also below the national average which was 14.2% in the ENSANUT 2018-19.

CONCLUSIONS

There are no statistical differences between both prevalences in 2014 rural compared to 2024 urban, although both were below the national average presented in the ENSANUT 2012, 2018-19. Lack of attention to actions aimed at the first 1000 days of life puts all the achievements achieved at risk.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_251

ASSESSING CO-COVERAGE OF MULTI-SECTORAL NUTRITION INTERVENTIONS: A SCOPING REVIEW OF ANALYTICAL APPROACHES AND EVIDENCE-BASED INDICATOR SELECTION

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BACKGROUND AND OBJECTIVES
Multi-sectoral nutrition approaches have gained prominence over the past two decades, emphasizing coordinated actions to combat malnutrition in low- and middle-income countries. However, there is a lack of clarify and consensus on how to measure co-coverage - the clustering of multiple interventions – across different types of target population groups and sectors. This paper examined existing methodologies and applications for assessing co-coverage of multiple nutrition interventions.
METHODS
A scoping review was conducted via literature search across Web of Science Core Collection, Medline, and EBSCOhost databases, focusing on three themes: coverage and co-coverage, methods for calculation and estimation, and nutrition and health interventions. Titles and abstracts were screened by two independent reviewers using Covidence software, followed by full-text screening based on pre-defined inclusion and exclusion criteria. Data extraction template was used to ensure high interrater reliability. Data extraction and summaries included key study characteristics and specific details on co-coverage methodologies and outcomes.
RESULTS
This review analyzed 80 articles on co-coverage of multisectoral nutrition interventions, extracted from an initial pool of 4478 abstracts. Most studies were observational (90%), with a growing number published over the past decade, and Sub-Saharan Africa and South Asia were the most represented regions. Data was primarily collected from household surveys (94%), particularly Demographic and Health Surveys (58%). Common interventions in co-coverage indices included antenatal care (ANC, 73 studies) or intervention components received in ANC, child immunizations (53 studies), and skilled birth attendance (46 studies). The selection of interventions was often guided by established global or national frameworks or guidelines. Coverage indices were calculated using methods such as simple counts, weighted averages, and scoring systems. While some studies validated their indices (using Cronbach’s alpha or sensitivity analyses), most relied on previously used methods without specific validation.
CONCLUSIONS
The review highlights the diversity of approaches in calculating co-coverage, the challenges of harmonizing methodologies, and considerations for multi-sectoral nutrition intervention coverage estimation across different contexts.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_253

UNIVERSAL FREE SCHOOL MEALS AND CHILD BODY MASS INDEX: AN ANALYSIS AMONG CHILDREN ATTENDING COMMUNITY HEALTH CENTERS IN THE US

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BACKGROUND AND OBJECTIVES

Currently in the U.S. high poverty schools nationwide are eligible to provide universal free school meals through a policy called the Community Eligibility Provision (CEP). The goal of universal free meals through this provision is to improve food security and child health outcomes. School lunch has been shown to be of higher diet quality compared to alternatives. Therefore, providing universal free lunch has potential to decrease high body mass index in childhood, but studies so far are limited and findings are mixed.

METHODS

We used children's residential address from electronic health records combined with child age, date of visit, school catchment boundaries, and school enrollment status to assign each child to the age-appropriate neighborhood school. We created a balanced panel of schools that were observed every year between school year (SY) 2013-14 and SY 2018-19 to have at least one child who attended an OCHIN clinic and had their height and weight measured during a given school year. We used modern difference-in-difference techniques to compare child-level average BMI z-scores from schools that adopted CEP to those that were eligible to adopt but did not do so.

RESULTS

The sample consisted of 164,108 observations from children who attended the 1260 unique schools distributed across 8 U.S. States. The sample was 49% male, mean age of 10.9 years, with 45.9% Hispanic, 25.3% White, 12.6% Black, 4.3% Asian, 0.4% Native American or Alaska Native, 0.7% Native Hawaiian or Other Pacific Islander, 1.5% Multiple racial identities, and 9.3% with unknown racial identity. After policy adoption, children attending schools that adopted CEP gained less in BMI z-score compared to children who attended schools that did not adopt the policy (difference-in-difference: -0.02 (95% CI: -0.04, -0.004)). The estimates for time since policy adoption suggest the impact of the policy on BMI z-score becomes larger over the first five years of the policy. However, we do also find some heterogeneity in effects by the year of adoption, whereby some adoption cohorts experience gains in BMI z-score.

CONCLUSIONS

Universal free school meals policies offer a promising population-level approach for slowing childhood BMI z-score gains. At the same time, evidence thus far suggests there may be heterogeneity in impacts, which deserves careful monitoring and continued evaluation.

CONFLICTS OF INTERESTS

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EPO5_255

CHILD HEMOGLOBIN TRAJECTORIES ACROSS THE FIRST 10 YEARS OF LIFE AND ASSOCIATION WITH CHILD DEVELOPMENT AND ACADEMIC ACHIEVEMENT AT 10-11 YEARS

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BACKGROUND AND OBJECTIVES

Anemia is a global public health concern, associated with increased risk of infections, impaired growth and cognitive delays. However, less is known about the significance of changes in hemoglobin (Hb) and cognitive outcomes in middle childhood. We examined the association between child Hb trajectories and cognitive development and academic achievement at 10-11 y.

METHODS

We used prospectively collected data from children born to women who participated in a micronutrient supplementation randomized controlled trial (PRECONCEPT) in Vietnam. The analytical sample included children (n=831) with Hb values at 3mo, 6mo, 1y, 2y and 10-11y and cognitive development (full scale intelligence quotient-FSIQ), and academic achievement (mathematics and reading language tests) at 10-11 y. Multivariable linear regression models were used to assess the association between Hb trajectories and cognitive development and academic achievement, adjusting for maternal (education/age/mentalhealth), child (age/sex/diet), home environment, socioeconomic status and intervention group.

RESULTS

Three distinct child Hb trajectories were identified (low-6.4%;middle-52.2%;high-41.4%). Children in the low trajectory started with lower Hb levels at 3 months (mean Hb: 9.7 g/dL) that remained lower through age 10-11 y (11.2g/dl). Those in the high trajectory had higher Hb levels from 3 months (11.1 g/dL) through age 10-11 y (13.7 g/dl). Children in the low Hb trajectory had significantly lower FSIQ (mean ± standard deviation: 89.8 ± 15.2) compared to those in the high Hb trajectory (93.2 ± 13.4). Likewise, math (12.1 ± 4.4 vs 13.5 ± 4.4) and reading (17.8 ± 6.1 vs 19.0 ± 5.0) scores were lower among children in the low Hb trajectory compared to high Hb trajectory, respectively ($p<0.05$). However, these differences were largely attenuated in the adjusted models. Compared to children in the high trajectory, those in the low (-0.63; 95% CI: [-4.30,3.04]) and middle (-1.21 [-3.00,0.59]) trajectories had non-significantly lower FSIQ at 10-11 y. Similarly, math and reading scores were mainly not significantly different among children in the low (0.07 [-1.29,1.43]; -0.62 [-1.80,0.56]) and middle (-0.49 [-1.17,0.18]; (-0.61 [-1.20, -0.03]) trajectories at 10-11y.

CONCLUSIONS

Child hemoglobin trajectories across the first 10 years of life were largely established early in life and had weak associations with child cognition and academic achievement at 10-11 y. Further path analyses may be valuable to unpack the complex and interacting drivers of child hemoglobin and child development.

CONFLICTS OF INTERESTS

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EPO5_256

STRENGTHENING ROUTINE VITAMIN A SUPPLEMENTATION IN KENYA AND MOZAMBIQUE: PROGRESS TOWARDS ACHIEVING 100% COVERAGE AMONG CHILDREN AGED 6–59 MONTHS

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BACKGROUND AND OBJECTIVES

Vitamin A is essential for child survival, reducing mortality by up to 24% in children aged 6–59 months. Despite its effectiveness, biannual Vitamin A Supplementation (VAS) campaigns are unsustainable in the long term. This study explores efforts and strategies in Kenya and Mozambique to integrate VAS into routine health services to achieve sustained coverage.

METHODS

In four counties of Kenya, 498,886 children were targeted in the second round of 2023 and 494,887 in the first round of 2024 through health facilities (6–11 months), community referrals (12–36 months), and ECD centres (37–59 months). In Mozambique, 708,260 children were reached in two provinces in the second round of 2023 and 723,768 in the first round of 2024 either via health centres, outreach programs, or community health workers depending on proximity. Both countries strengthened VAS delivery through supervision, capacity building and data audits. Monthly administrative coverage was monitored and feedback given to drive continuous improvement

RESULTS

In Kenya, Semester coverage across four counties averaged 91% in 2023, increasing to 95% in 2024. Monthly coverage varied significantly, ranging from 32% to 296% (2023), and 55% to 146% (2024). The first round of 2024 achieved a more consistent monthly coverage through improved routine service delivery compared to the large spikes and contrast during the campaign-driven second round of 2023. In Mozambique, VAS coverage across two provinces was 86% in the second round of 2023, slightly declining to 82% in the first round of 2024. Monthly coverage during the second round of 2023 ranged from 70% to 89%, and between 72% and 89% in first round of 2024.

CONCLUSIONS

Routine VAS delivery demonstrates significant potential for sustained coverage, providing stability and resilience compared to short-term campaigns. The experiences in Kenya and Mozambique underscore the importance of integrating VAS into national health systems to achieve consistent and long-term child health outcomes.

CONFLICTS OF INTERESTS

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EPO5_258

TIME TRENDS IN SOCIAL JETLAG, CHRONOTYPE AND BODY FAT COMPOSITION IN UNIVERSITY STUDENTS BEFORE, DURING AND AFTER THE COVID-19 PANDEMIC

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BACKGROUND AND OBJECTIVES
Previous studies suggest that the Covid-19 related lockdown favoured a reduction in social jetlag (SJL) due to a better alignment of daily routines with the internal clock and the chronotype. So far, studies analysing the development of the SJL after the lockdown are missing. On the other hand, it is discussed that the pandemic favoured an increase of body fat mass. This study investigates the hypothesis that i) the SJL increased again after the lockdown ii), the lockdown favoured an increase of body fat mass, iii) chronotype as a biological construct changed only in an age-related manner.
METHODS
Of the 320 university students (18 to 25 y, 57% female) recruited before the lockdown within the ChroNu study 156 took part in an online survey in June 2020 and 110 participated in a follow-up examination in autumn 2022. Time trend analysis of chronotype and SJL were based on data from 192 participants, while pre-post comparison in body fat was based on data from 52 students participating in both examinations. Chronotype and SJL were estimated using the Munich Chronotype Questionnaire. Body composition was assessed by bioelectrical impedance analysis. Questionnaires provided information on the frequency and duration of physical activity and screen time. Time trends in SJL, chronotype and visceral fat mass were analysed by mixed-model analyses over the three and two time points, respectively.
RESULTS
SJL showed a U-shaped curve that was not explained by age, high screen time or physical activity ($p=0.0001$). Changes in chronotype and visceral fat mass were explained by age ($p=0.15$ and $p=0.3$).
CONCLUSIONS
The RESULTS of this study suggest that the lockdown-related decrease in SJL was transient only, yet that the lockdown did not adversely affect visceral fat mass development among students.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_259

UNIVERSITY STUDENT' BODY WEIGHT STATUS AND ITS RELATED DIETARY PATTERNS: A COMPARATIVE ANALYSIS BETWEEN UNIVERSITY RESIDENTS AND NON-UNIVERSITY RESIDENTS

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BACKGROUND AND OBJECTIVES
Unhealthy dietary patterns are associated with an increased risk of obesity among university students. This study aims to examine the association between dietary patterns with body weight status among university students.
METHODS
This cross-sectional study involved 271 university students aged 18 to 29 years from Klang Valley, Malaysia. A validated questionnaire was used to assess sociodemographic characteristics and dietary patterns. Body weight status was determined by body mass index classification.
RESULTS
One-third of the university students were overweight or obese. Only one-sixth of students (17.0%) consumed all three main meals regularly on a daily basis. Three out of four university students (75.6%) skipped breakfast daily. Lunch and dinner skippers accounted for 27.7% and 41.0%, respectively. Daily consumption of both fruits and vegetables was notably low at 6.8%. A higher percentage of university residents ate out at least three times per week compared to non-university residents (70.4% vs. 58.9%, p=0.018). When preparing home-cooked meal, majority of students (74.2%) prepared imbalanced meals. Instant food consumption was significantly higher among university residents compared to their counterparts (61.3% vs. 48.1%, p=0.029). Multinomial logistic regression reported university students who ate out at least three times per week were twice more likely (OR: 2.11, 95% CI: 1.08-4.12, p=0.030) to be overweight or obese. Main meal consumption frequency was not significantly associated with obesity.
CONCLUSIONS
Frequency of eating-out was positively associated with obesity among university students. Continuing programs and interventions to promote healthy eating within university environment are essential to address the issue of obesity among university students.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_260

DOES HEALTH SERVICE USE AND PEER SUPPORT MEDIATE THE RELATIONSHIP BETWEEN MATERNAL ORIGIN AND BREASTFEEDING OUTCOMES?

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BACKGROUND AND OBJECTIVES

The association of higher maternal health service utilization and increased duration of breastfeeding is well established. However, immigrant women often face challenges in accessing these services. We examined differences in maternal and child health service utilization between immigrant and Finnish-speaking mothers, exploring the potential mediating roles of breastfeeding peer support, postpartum nurse home visit, and utilization of child health clinic.

METHODS

We analyzed data from the nationwide FinChildren 2020 survey, comparing Somali (n=29), Arabic (n=81), and Russian-speaking (n=181) parents and their infants with native Finnish speakers (n=5145). We conducted a causal mediation analysis to investigate the mediating effects.

RESULTS

Child health clinic attendance varied significantly: 23% of the infants born to Somali-/Arabic-speaking missed visits compared to 0.4% for infants born to Finnish-speaking and 1.65% for Russian-speaking mothers ($p<0.001$). Additionally, 22% of Somali- and Arabic-speaking mothers and 0.6% of Finnish-speaking mothers reported not utilizing child health clinic services in general ($p<0.001$). Somali-/Arabic-speaking mothers received the least breastfeeding support from peers. Peer support attenuated the negative association between maternal origin and exclusive breastfeeding (OR 1.02, 95% CI -0.01, 0.00 p= 0.04), whereas postpartum nurse home visits had the opposite effect (OR 0.99, 95% CI 0.008, 0.01p= 0.002).

CONCLUSIONS

This study reveals significant disparities in health service use, with Somali and Arabic-speaking mothers utilizing child health clinic services less frequently compared to native-born mothers. Although immigrant mothers received breastfeeding peer support the least, this service effectively mitigated the negative impact of maternal origin on exclusive breastfeeding. Further research is warranted to understand barriers that immigrant mothers face in accessing child health services and in receiving breastfeeding peer support, to better address these disparities.

CONFLICTS OF INTERESTS

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EPO5_263

The association between prenatal maternal Selenium concentration and neurodevelopment in early childhood, RESULTS from a mother-child cohort study

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BACKGROUND AND OBJECTIVES
Selenium (Se) is a micronutrient crucial for human health and the developing brain. A few studies have shown positive associations between maternal Se and child neurodevelopment. We aimed to describe Se status in pregnant Nepalese women and explore the association between maternal Se concentration in early pregnancy and child neurodevelopment in Nepalese children.
METHODS
The cohort study included 800 mother-infant dyads from Nepal. Se concentration was analyzed by inductively coupled plasma mass spectrometry. Child neurodevelopment was assessed at 8-12 weeks using Test for Infants motor performance (TIMP) and at 6, 12, and 24 months with the Bayley Scales of Infants and Toddler Development, 3rd edition (Bayley-3). The association between the TIMP total score, and maternal Se concentration was estimated by using multiple linear regression. We used linear mixed models to examine the association between maternal Se and Bayley-3 scores adjusted for maternal age and socioeconomic status.
RESULTS
The mean (SD) maternal Se concentration was 74.8 µg/L (10.4 µg/L), and 290 (36.3%) pregnant women had Se concentration indicating deficiency (< 71.1 µg/L). We found no significant association between maternal Se and the TIMP total scores (Coeff. -0.035 (95% CI: -0.105, 0.036) and the Bayley-3 total z-score (Coeff. 0.002 (95% CI: -0.007, 0.011) and no associations between Se concentration and any of the Bayley-3 composite and subscale scores.
CONCLUSIONS
Despite a substantial proportion of pregnant women with Se deficiency, maternal Se concentration was not associated with early childhood neurodevelopment in our study cohort of healthy pregnant women.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_264

MULTI-DOMAIN TELEHEALTH INTERVENTION AMONG COMMUNITY-DWELLING OLDER ADULTS WITH COGNITIVE IMPAIRMENT, FRAILTY OR COGNITIVE FRAILTY: A FEASIBILITY STUDY

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BACKGROUND AND OBJECTIVES
Cognitive Impairment (CI) or frailty are precursors of dementia risk. Little is known about multi-domain telehealth intervention conducted among community-dwelling older adults. Thus, a 6-month quasi-experimental study was conducted among 50 community-dwelling older adults at risk of CF to determine its feasibility.
METHODS
Respondents were allocated into the intervention group (n = 26) or the control group receiving a self-guided web-based educational module (n = 24). The intervention module consists of online consultation with multi-disciplinary healthcare providers and structured digital multi-domain intervention, where a telehealth system supports in-person activities. The primary outcomes were retention, satisfaction, and completion of an online module. Meanwhile, secondary outcomes included assessment of cognitive, frailty, depression, physical fitness, anthropometry, dietary intake, management of metabolic risk, and vascular and quality of life (sleep). Data were assessed at baseline, 12th, and 24th weeks. Data was analysed descriptively, while intervention effects were analysed using repeated measure Analysis of Varience (ANOVA). The overall mean differences (MD) were evaluated by an independent sample t-test.
RESULTS
The intervention group demonstrated a high retention rate of 94.3% (Intervention: 92.9%; Control: 96%), and satisfaction rates were favourable. Completing the online modules and consultation with healthcare providers was almost 100%. Significant interaction effects were observed for quality of life (sleep) ($p < 0.05$). The intervention group demonstrated a favourable MD in a 10-second one-leg stand, subjective sleep quality, High-Density Lipoprotein Cholesterol (HDL-C), and niacin intake ($p < 0.05$ for all parameters)
CONCLUSIONS
The WE CARE iAGELESS multi-domain telehealth intervention was feasible for community-dwelling older adults with CI or frailty. Therefore, the module can potentially increase physical function, quality of life (sleep), vascular health, and dietary intake
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_266

ASSESSING CHILD FOOD INSECURITY IN SELECTED DISTRICTS OF ZIMBABWE: INSIGHTS FROM THE CHILD FOOD INSECURITY EXPERIENCE SCALE METHODOLOGY EXPLORATORY SURVEY

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BACKGROUND AND OBJECTIVES
Food insecurity is a critical public health issue affecting millions of children globally, with significant implications for their growth and development. In Zimbabwe, economic challenges, climate variability, and socioeconomic factors exacerbate child food insecurity. This study utilized the Child Food Insecurity Experience Scale (CFIES) to explore the prevalence and determinants of food insecurity among school-age children in Zimbabwe. The study aimed to establish baseline data on child food insecurity prevalence in selected districts and identify associated factors within the target population.
METHODS
An exploratory school-based cross-sectional survey was conducted across three districts; Mutoko, Murewa, and Mudzi in Zimbabwe. A total of 620 children aged 10 to 17 years from 12 schools were included in the study. Data were collected through structured questionnaires covering demographic information, food insecurity experiences and access to water, sanitation and hygiene. Statistical analyses were performed using SPSS and STATA. Regression and inferential analyses were employed to identify and validated factors associated with child food insecurity experience.
RESULTS
The mean CFIES score was 10.01, range 8.01 - 11.52, while the prevalence of many experiences of food insecurity ranged from 44.8% to 47.7%. Younger children, being female and residing in Murewa district had increased risk of experiencing food insecurity while residing with both biological parents was associated with a reduced likelihood. In cross-contextual equivalence analysis, the most frequently affirmed food insecurity experiences were: worries about food scarcity and the inability to obtain desired food. The range of variance of the CFIES model was 0.90 - 1.38 validating effectiveness of the methodology in capturing experiences of food insecurity among children.
CONCLUSIONS
The findings revealed that child food insecurity is high in the selected districts. The social and behavioral impacts of food insecurity among children were highlighted underscoring the need for interventions that not only improve access to nutritious food but also enhance the social and psychological well-being of the affected children. Moreover, the importance of stable family structures and access to clean water in alleviating food insecurity emerged as critical components influencing food security. Future research should continue to explore these dynamics for comprehensive policy development aimed at supporting vulnerable children.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_267

DETERMINANTS OF FOOD INSECURITY AMONG URBAN POOR HOUSEHOLDS IN KUALA LUMPUR

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BACKGROUND AND OBJECTIVES
Household food insecurity, defined as limited or uncertain access to adequate, safe, and nutritious food, remains a critical issue among urban poor communities. While previous research in Malaysia has identified low-income households as vulnerable to food insecurity, limited evidence exists on the specific determinants affecting urban poor populations living in low-cost flats. This study aimed to determine factors associated with food insecurity, providing targeted insights for interventions addressing urban poverty and food security challenges.
METHODS
A cross-sectional survey was conducted among 156 households from 10 selected low-cost flats in Kuala Lumpur. Mothers completed a self-administered questionnaire assessing socioeconomic status, psychological well-being, and dietary intake using a 24-hour dietary recall. Anthropometric measurements and blood samples for biochemical analysis of the mothers were also collected. Binary logistic regression was used to analyse factors significantly associated with food insecurity.
RESULTS
In this study, 45.5% of households were identified as food insecure, with the majority (91.0%) from the low-income category and 9.0% from the middle-income category. However, household income was not significantly associated with food security. Significant factors associated with food insecurity included higher maternal stress (OR = 2.5, 95% CI: 1.8–3.5), higher maternal depression (OR = 1.9, 95% CI: 1.3–2.8), elevated triglycerides (OR = 1.4, 95% CI: 1.1–1.8), and higher carbohydrate intake (OR = 1.6, 95% CI: 1.2–2.2). Protective factors included higher maternal education (OR = 0.6, 95% CI: 0.4–0.8), better diet quality (OR = 0.5, 95% CI: 0.3–0.7), and greater fruit and vegetable intake (OR = 0.7, 95% CI: 0.5–0.9).
CONCLUSIONS
Maternal education, mental health, and diet quality emerged as critical determinants of household food insecurity. Addressing higher maternal stress and depression, improving maternal education, and promoting healthier diets can significantly mitigate food insecurity and its associated consequences. These findings emphasize the importance of developing targeted, evidence-based policies and interventions to improve maternal mental health, education, and diet quality to enhance household food security and reduce its public health burden among urban poor populations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_268

HOW CAN I PREPARE MY CHILD TO EAT AT SCHOOL? A MIXED METHODS SYSTEMATIC REVIEW ON THE AVAILABILITY AND CONTENT OF RESOURCES TO SUPPORT THE TRANSITION OF CHILDREN FROM PRE-SCHOOL TO PRIMARY SCHOOLING

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BACKGROUND AND OBJECTIVES
Nutrition in the early years is crucial to support learning and development. Pre-school aged children will experience a significant transition when they move from the pre-school or childcare based mealtimes to a school-based mealtime environment. The significant changes experienced during this transition such as differing food availability choices, increased independence to manage food packaging and food intake can impact overall nutritional intake for young children. Continued compromised oral intake during the transition to school period can impact current and future learning and growth potential. This systematic review aims to identify the availability of resources and review the content of nutrition-based resources for supporting the transition/preparation skills of pre-school children and their family to the primary school mealtime environment.
METHODS
This mixed methods systematic review was guided by the JBI mixed methods systematic review principles. This review was conducted using six databases and a review of the grey literature. The search yielded a total of 3000 articles. The screening process is currently in process and we anticipate the RESULTS soon. Additionally, a review of grey literature will also be completed to identify resources that are currently available to support children and their caregivers. The findings will be reported following a narrative analysis. This systematic review was registered with PROSPERO.
RESULTS
Briefly the findings indicate that there is very limited empirical evidence that target the practical skills that children require for transitioning to the school mealtime environment. However, there is a variety of grey literature sources that specifically target skills such as introducing lunch boxes early, educating children about mealtimes and practicing school mealtime skills prior to commencing primary schooling. The complete analysis will be available shortly.
CONCLUSIONS
The findings of this systematic review will be used to guide the larger study that will include qualitative interviews and a national survey with parents of children commencing primary schooling, early childhood educators and teachers. Specifically, the systematic review findings which will be available shortly will help guide questioning for the qualitative phase and as well as identify underserved areas or skills for both parents and children in currently available resources.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_269

IRON AND VITAMIN D STATUS IN CHILDREN AND ADOLESCENTS AND THE INFLAMMATORY BACKGROUND

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BACKGROUND AND OBJECTIVES

Iron (Fe) and vitamin D deficiency are two of the most common in the world[1,2]. It is an urgent matter to investigate if there is a relationship between these two major factors in children's development. Our study aims to see if there is an association of Fe status and 25(OH)D levels in children and adolescents.

METHODS

This is a cross-sectional study with children and adolescents aged six to 17 years old. Blood was collected after 12 hours of fasting, 25-hydroxyvitamin D (25(OH)D) levels were assessed using a chemiluminescence method, blood cells were analyzed using the counting method by impedance, and the cell analysis were performed by continuous flow cytometry. In total, 670 children and adolescents aged six to 17 years old registered in a social project called “Estação do Conhecimento” in Serra - Espírito Santo, a metropolitan city in Southeast Brazil.

RESULTS

A high prevalence of 25(OH)D deficiency and insufficiency, there was no connection found with Fe indices. There was a significant correlation between 25(OH)D and serum transferrin (r=0.116; p=0.003), while no positive correlation was found between ferritin, total iron, hemoglobin and hematocrit with 25(OH)D. When stratifying vitamin D levels, a significant association was observed with serum transferrin (p=0.018) using the ANOVA test. After performing the Tukey test, a significant difference was found between the insufficient and deficient groups. It can also be highlighted the different aspects in 25(OH)D among sex, it was found a higher prevalence of both deficiency and insufficiency in boys. In this specific population, it was not found a high prevalence of low Hb levels.

CONCLUSIONS

The role of vitamin D in inflammation seems to be a key factor in its relationship with many casualties this peculiar vitamin is being linked to, more studies are needed to fully understand this role of vitamin D in inflammation so we can better comprehend so many correlations found with this vitamin.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_270

A RANDOMIZED CONTROL TRIAL TO ASSESS THE EFFECT OF FINGER MILLET-BASED DIET SUPPLEMENTATION ON ANTHROPOMETRY AND BODY COMPOSITION AMONG PRESCHOOLERS AGED 2-5 WITH MODERATE ACUTE MALNUTRITION (MAM) COMPARED TO EXISTING WHEAT AND RICE BASED DIET

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BACKGROUND AND OBJECTIVES
Malnutrition is a widespread global health challenge. India faces significant child undernutrition despite ongoing efforts of government nutrition programs. Finger millet (Ragi), known for its rich nutrient profile, offers the highest calcium (364mg/100g), balanced amino acids & high dietary fibre with polyphenols and flavonoids which help to modulate gut microbiota into beneficial way. Improving nutrition status through gut microbiome serves as a sustainable diet approach in treating malnutrition. This study focuses on the use of Finger millet-based supplement with dates powder(FMD) in comparison to existing wheat and rice based Balamrutham with dates powder (BMD) to assess its impact on MAM children's anthropometry and body composition status.
METHODS
A randomized controlled intervention was conducted in Anganwadi centres of Hyderabad, Telangana, India, among 136 MAM children (24-59 mnths) (WHZ -2 to -3). Subjects were randomly assigned to two groups to receive either FMD, or existing BMD Ready to use therapeutic food for 8 weeks intervention. Nutrient adequacy (24h diet recall), growth indicators (weight, height, MUAC), body composition were assessed at baseline and endpoint.
RESULTS
Both FMD(n=71) and BMD(n=65) groups showed improvements in weight and MUAC after the 8-week intervention ($p<0.05$) with 80% consumption. An average weight gain of 1.80 and 1.33g/kg/d was observed in FMD (7.4%) & BMD (5.5%) respectively. WHZ scores significantly improved in FMD (from -2.39 to -1.98) and in BMD (from -2.38 to -2.23) ($p<0.05$). FMD showed great improvements in mineral mass (78%), Skeletal Muscle Mass (28%), body cell mass (7%) and bone mineral content (~226%) ($p>0.05$) while BMD subjects exhibited increase in Inter Cellular Water (12.3%), protein mass (~15%), Skeleton Lean Mass (10.0%), Fat Free Mass (11%) and Basal Metabolic Rate (2%). However, 90% of MAM subjects were found to be micronutrient inadequate (MPA<0.5) and did not meet the AMDR criteria.
CONCLUSIONS
Replacement of wheat and rice based diet with Ragi & date powder in the existing supplementary Program improved anthropometry and body composition parameters among MAM children. Thus, finger millet can combat undernutrition as nutritious as well as sustainable option. Further studies are warranted to confirm these observation to include in food supplementary programs.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_271

STUDY ON MICRONUTRIENT INTAKE AMONG TAIWANESE CHILD-BEARING AGE WOMEN AND THEIR ADHERENCE TO THE PLANT-BASED DIET

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BACKGROUND AND OBJECTIVES
Child-bearing age is a critical period for storing nutrients for pregnancy, which affects fetal growth and long-term health. The nutrition status of Taiwanese child-bearing age women is suboptimal, and information on food sources for key nutrients is pending. Plant-based diet has recently been advocated domestically. However, specific dietary recommendations for various caloric levels and life stages are needed. The objectives are to investigate the micronutrient intake status of child-bearing age women in Taiwan, and to provide recommendations on food portions and choices based on a plant-based diet design, and to verify if the nutritional needs of these people can be satisfied.
METHODS
The micronutrient intake of 16- to 49-year-old women was analyzed using 2017-2020 National Nutrition and Health Survey database. Based on the plant-based diet handbook, recommended portions of food categories for different calorie levels were designed. We summarized dietary principles and established a Plant-Based Diet Index (PBDI) for evaluating dietary adherence.
RESULTS
Women aged 25 to 29 years had the highest intake of calories and macronutrients, but their micronutrient intake was worse than those of other groups. Over 50% of child-bearing age women had insufficient intake of calcium, iron, magnesium, zinc, potassium, vitamin D, and vitamin E. Ensuring adequate intake of unrefined whole grains and vegetables to meet their needs of nutrients that are easily deficient is important. Out of PBDI range of 0–100, the average scores for child-bearing age women was 41.4 ± 0.6. PBDI analysis showed that better diet quality in older ($p < 0.0001$) and cohabiting/married women ($p = 0.0093$). Overall, child-bearing women had higher adherence to seafoods and eggs, fatty acid ratios, refined grains, and saturated fatty acids; lower adherence to whole grains, soy products, mushrooms and kelp, and nuts and seeds consumption. PBDI had significant positive correlations with blood folate and vitamin D concentration.
CONCLUSIONS
There exists a problem of high prevalence of insufficient intake of calcium, iron, magnesium, zinc, potassium, vitamin D, and vitamin E among Taiwanese child-bearing age women. Increasing consumption of unrefined grains, soy products, vegetables, and nuts and seeds must be emphasized when advocating plant-based diet for Taiwanese child-bearing age women. (The content of this research may not represent the opinion of the Health Promotion Administration, Ministry of Health and Welfare.)
CONFLICTS OF INTERESTS
The authors have no conflict of interest.
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EPO5_272

INFLUENCE OF MATERNAL DIET AND GESTATIONAL AGE ON THE MACRONUTRIENT AND LIPID COMPOSITION OF HUMAN MILK

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BACKGROUND AND OBJECTIVES
Breast milk provides nutrients and essential bioactive compounds for maternal and infant health, and its composition varies according to factors such as maternal diet. The aim of this study was to describe the macronutrients composition, the lipid profile of human milk and its relationship with maternal diet and gestational age.
METHODS
Descriptive, cross-sectional study, with non-probabilistic, convenience sampling. The sociodemographic characteristics, human milk (Lactoscan, Rose-Gottlieb method and gas chromatography) and diet (food consumption frequency, analysis with EVALFINUT 2.0) of 30 women aged 18 to 45 years, mothers of newborns admitted to intensive care, were analyzed. One sample per mother was obtained, colostrum, transitional or mature milk (September 2023 - July 2024). For quantitative variables, the mean, standard deviation (SD) and analysis with T test or Mann-Whitney (significance $p \leq 0.05$) were used.
RESULTS
Among the 30 mothers, 24 had premature babies, with respect to the pre-pregnancy body mass index (BMI), 4 were underweight, 11 were overweight or obese. The fat content of colostrum (2.66 g/100 mL) and transitional milk (2.68 g/100 mL) was significantly lower ($p \leq 0.05$) than in mature milk (4.58 g/100 mL). The average lipid profile was: 45.78% saturated fatty acids (SFA), 34.79% monounsaturated fatty acids (MUFA), 15.97% polyunsaturated fatty acids (PUFA), omega 3 PUFA (ω3 PUFA) 1.32%, omega 6 PUFA (ω6 PUFA) 14.34%. Capric, lauric and myristic SFAs were significantly higher in transitional and mature milk and PUFAs were higher in colostrum. The higher dietary SFA content (4.72 - 18.91% of total caloric value) was significantly associated with a decrease in milk PUFAs (9.04 - 21.66 g/100 g of lipids). Dietary SFAs and MUFAs (4.62 - 18.15% of total caloric value) were positively correlated with the milk AA/(EPA+DHA) ratio (AA: arachidonic acid, EPA: eicosapentaenoic acid and DHA: docosahexaenoic acid). We found a positive correlation between gestational age (29-40 weeks) and the PUFAω3 content (0.720 - 2.788 g/100g of lipids) and a negative correlation for the AL/ALA ratio (AL: linoleic acid, ALA: alpha linolenic acid) of milk.
CONCLUSIONS
Lipid content is significantly higher in mature milk and the type of FA varies according to the type of milk. Dietary SFA and MFA modify the lipid profile of milk. At lower gestational ages, a lower content of ω3 PUFA and a significant increase in the LA/ALA ratio are observed.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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alimentos y bebidas en los hogares uruguayos. Una mirada a la realidad nacional y en hogares donde viven niños menores de 5 años.

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EPO5_274

EARLY RETIREMENT PENSIONERS DIAGNOSED WITH OBESITY OF OTHER HYPERALIMENTATION IN GERMANY - AMORTIZATION OF GRANTED MEDICAL REHABILITATION MEASURES DEPENDING ON THE INCOME STATUS OF GERMAN PENSION INSURANCE SCHEME (DRV) INSURES

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BACKGROUND AND OBJECTIVES
In order to avoid early retirement (ER) the German statutory pension insurance fund covers the cost of rehabilitation for employees whose working capacity is endangered due to health problems. However, the granting of medical rehabilitation must adhere to the principles of economic efficiency and frugality (§ 13 (1) SGB VI, Federal Ministry of Justice 2022). We aimed to describe the use of medical rehabilitation among insured persons received a disability pension due to obesity or other hyperalimentation (ICD E65-E68) with special consideration of sociodemographic determinants.Furthermore, amortization of rehabilitation was estimated stratified according to different income groups.
METHODS
Analysis based on 20% random samples of administrative pension records from the Research Data Centre of the German Federal Pension Insurance, which include all new cases of early retirement (ER) from 2001 to 2020 (DRV FDZ 2022).We estimated risk of non-utilization of medical rehabilitation using logistic regression models. Amortization of rehabilitation was calculated according to Schneider (1989).
RESULTS
The data set contains 681,189 insured persons aged up to 64 years who were granted an EM pension for the first time between 2001 and 2020. After exclusion of persons who received occupational rehabilitation, 661,227 persons are left, of whom 371,180 (56.5%) did not receive medical rehabilitation in the five years before the granting of ER pension. Among them, 3,233 (0.5 %) persons received a ER pension due to obesity or other hyperalimenation. 1,958 out of these 3,233 (60.6%) did not receive medical rehabilitation. Risk factors for not receiving medical rehabilitation are male gender, foreign nationality, low or unknown education, low or unknown job requirement profile, low income as well as low pension payment amount. For example, adjusted risk (Odds Ratio [95%-CI]) among persons with low income (1st quartile vs. 4th quartile), was 3.4 [2.6;4.4]. The duration of employment after rehabilitation for amortization the costs of rehabilitation increases with lower income (lowest quartile of income: 18 months, 2nd quartile: eight months, 3rd quartile: five months, upper income quartile: four months).
CONCLUSIONS
One reason for the social inequality in the implementation of the principle "rehabilitation before pension" could be the difficulty of complying with the economic efficiency and frugality requirement when granting medical rehabilitation measures for economic disadvantaged persons.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_275

DEVELOPMENT OF A MOBILE HEALTH APPLICATION FOR PROMOTING THE RECOMMENDATIONS OF THE DIETARY GUIDELINES FOR THE BRAZILIAN POPULATION

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BACKGROUND AND OBJECTIVES
Health apps are tools for food education and self-care[1], contributing to the improvement of healthy eating behaviors[2]. In Brazil, the Dietary Guidelines for the Brazilian Population promote habits aligned with traditional dietary patterns[3]. This study describes the development of a mobile application aimed at promoting healthy eating and increasing adherence to the Brazilian dietary pattern recommended by the Guidelines.
METHODS
This methodological study was based on the development of a mobile application for smartphones. The process followed the design thinking4 methodology and was led by a committee of experts in the Guidelines, digital health, and eating behavior change. It involved three steps: 1) literature review and theoretical framework definition; 2) app ideation, including benchmarking5, interviewing potential users to explore perceptions and needs regarding changing eating habits, and creating a persona; and 3) content development and app design.
RESULTS
1) The Dietary Guidelines for the Brazilian Population and the transtheoretical model of behavior change were defined as the theoretical basis. 2) We interviewed 8 individuals (average age: 38 years, 87.5% women). Challenges for changing eating habits included exposure to unhealthy food environments, lack of time, motivation, and information. 3) Based on this diagnosis, the app was conceptualized as a 6-month self-instructional program with five progressive levels: beginner, intermediate, advanced, expert, and specialist, each divided into two modules with seven sessions. Sessions will deliver trusty information and strategies to overcome barriers such as limited culinary skills and time. Interactive features include quizzes, matching and completing sentence challenges, true or false activities, and a question bank for evaluative content at the end of each session. Additional features include a main menu, tutorial, interactive avatar, and gamification strategies like rewards to unlock premium content, aimed at increasing engagement.
CONCLUSIONS
The app is currently under development and parallel usability tests. Collaboration with experts guided research methodology and design. It is expected to enhance adherence to the Brazilian dietary pattern, promote self-care, and expand technological resources, supporting Brazil's Digital Health Strategy and public health system.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_276

HOW CAN WE SUPPORT DUTCH OLDER CONSUMERS TOWARDS AN OPTIMAL AND SUSTAINABLE PROTEIN INTAKE – OUTCOMES OF THE "DUURZAAM EIWITWIJS" PROJECT

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BACKGROUND AND OBJECTIVES
A diet with sufficient protein is important for maintaining muscle mass, muscle strength and self-reliance in community-dwelling older adults ≥ 65 years (CDOA). It is known that many of them do not consume enough protein, and that they are often unaware of this. Furthermore, most older adults still consume an omnivorous diet. Climate goals require a shift towards a more sustainable diet, optimally with 60% of proteins being plant-based. Our aim was to define how we can support CDOA, dietitians and food small and medium-sized enterprises (SMEs) with knowledge and products to achieve an optimal protein intake.
METHODS
In this project several studies were carried out to identify key behavioural aspects of optimal protein intake, the development of new food product concepts that fit the needs, and evaluate and optimise dietary information material to be used by dietitians. A consumer panel was formally set up to recruit participants, and connections with community centres were established to reach elderly with low socio-economic positions.
RESULTS
Qualitative research into consumer behaviour showed that still many participants had low consciousness of current protein intake. Despite several opportunities to guide them in the shift towards more plant-based protein (e.g. just to try it), barriers were also identified (e.g. routines, inflexibility). Our modelling study showed that eating more plant-based does not severely impact protein quality, but shifting towards a fully vegan diet does. However, with careful meal planning, it is possible to compose meals with high protein quality [1]. Outcomes were used to develop new food products and redesign a ready-made meal sequence towards sustainable, high protein quality meals by participating food SMEs. Current Dutch dietary advisory material was evaluated and showed that limited information on plant-based diets was available. Requirements were identified and new material was developed and evaluated, that may support dietitians in providing adequate dietary counselling. A masterclass was developed for dietitians focusing on sustainable nutrition, with an emphasis on the protein transition and the practical dilemmas in dietary counselling for CDOA. In addition, a workbook has been created for CDOA who consult a dietitian, which may support clients in achieving sustainable nutrition with sufficient protein (quality).
CONCLUSIONS
Altogether these data exposed barriers and promotors in current dietary behaviour of CDOA, that can be deployed in order to support the target population towards an optimal and sustainable protein intake. Next, these outcomes could be put into practice.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_277

FOOD INSECURITY AND NUTRITIONAL INADEQUACY IN CHILDREN AND ADOLESCENTS OF BASIC EDUCATION SCHOOLS OF CANTAGALO DISTRICT IN SÃO TOMÉ AND PRÍNCIPE, CENTRAL AFRICA

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BACKGROUND AND OBJECTIVES
Food insecurity (FI) is a critical socioeconomic and public health problem globally, particularly affecting children's nutritional status and development. This cross-sectional study aimed to assess the prevalence of nutritional inadequacy among children and adolescents in the Cantagalo district of São Tomé and Príncipe, in Central Africa. It also assessed their households' FI situation and examined sociodemographic, anthropometric, and nutritional characteristics associated with severe FI.
METHODS
Data included 546 children/adolescents (51.8% males, aged 9-15 years) from the eight public basic education schools. A structured questionnaire provided sociodemographic data, while anthropometric measurements assessed nutritional status. Dietary intake data were gathered using a single 24 h dietary recall, and the adjusted prevalences of nutritional inadequacy were obtained using version 2.0 of the PC-Software for Intake Distribution Estimation (PC-SIDE®). The Household Food Insecurity Access Scale was used to assess FI, and households were classified as severely or non-severely food insecure. Multivariable binary logistic regression models adjusted for potential confounders identified factors related to FI.
RESULTS
Children's/adolescents' thinness was exhibited in 34.1% of participants, and over 95% had inadequate intake of essential micronutrients, including iron. Notably, 73.7% were severely food insecure.
CONCLUSIONS
It is noteworthy that higher severity of FI was positively associated with a lower intake of iron and certain household head characteristics, such as being female or older, and negatively associated with having a home garden.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_278

BIOMONITORING OF TRACE ELEMENTS IN PLASMA OF OBESE CHILDREN IN BRAZIL: RELATIONSHIP WITH ENVIRONMENTAL AND DIETARY FACTORS

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BACKGROUND AND OBJECTIVES
The prevalence of childhood and adolescent obesity is increasing worldwide with an estimation of 124 million people in 2016. Due to its multifactorial nature, obesity requires a multidisciplinary approach to its treatment. Factors such as diet, genetic components, lifestyle, environmental factors, and other exposures are extremely important to be studied. The objective of this study was to conduct a biomonitoring of obese adolescents from municipal schools in Fortaleza, CE, Brazil.
METHODS
This is a cross-sectional study involving approximately 114 adolescents aged between 10 and 14 years, who are part of the third phase of the Estudo de Nutrição e Saúde de Crianças e Adolescentes de Fortaleza (ENSCA-FOR) and attend municipal schools in Fortaleza. Initial data (T0) were collected: sociodemographic data, through interviews and specially designed forms; anthropometric data, through the collection of weight, height, and waist circumference. Inorganic trace elements were also evaluated from blood plasma samples using inductively coupled plasma mass spectrometry (ICP-MS). Additionally, environmental factors such as the Human Development Index (HDI), safety, and diet-related factors such as the degree of food processing, were analyzed. Data analysis was performed using the SPSS 22.0 program, with p-values less than the significance level of 5% considered significant. Variables with normal distribution were tested using the t-test for independent samples and expressed as mean and standard deviation, while those not normally distributed were tested using the Mann-Whitney test
RESULTS
Arsenic, Hg, and Ni average values were 8.48 μg L-1, 6.78 μg L-1, and 7.55 μg L-1, respectively. Furthermore, Fe, Hg, and Zn are positively associated with the HDI, and the elements As, Co, and Hg are positively related to the degree of food processing. The sample of obese adolescents studied showed a profile of high plasma concentrations of As, Hg, and Ni with a clear difference between regions of the municipality.
CONCLUSIONS
Environmental and dietary factors are associated with high levels of toxic elements in obese children from Fortaleza, Brazil. There are few studies with this population, so the risk of contamination has not been completely elucidated yet, requiring further studies that reference average safety values, with more exposure variables to identify existing associations and more studies with this population and other age groups.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_279

EXPLORATORY ANALYSIS OF DIETARY FAT INTAKE AND BLOOD LIPID BIOMARKERS IN NURSING HOME RESIDENTS AND COMMUNITY-DWELLING OLDER ADULTS

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BACKGROUND AND OBJECTIVES
Lipid profiles and dietary fat intake are associated with cardiovascular health. Understanding these factors in older adults, especially those in vulnerable groups like NH residents, is crucial due to their potential impact on overall health and disease risk. This study aims to compare dietary fat intake and blood lipid biomarkers between nursing home (NH) residents and community-dwelling (CD) older adults, while exploring the role of physical activity in influencing blood lipid profiles. Understanding these variations is crucial for improving health outcomes and tailoring interventions for vulnerable populations.
METHODS
The data for the comparative study include CD elderly aged 64–74 years (NutriHealth study; n = 128), and NH residents aged 65-101 years (NutriCare study; n = 257). Individuals with diagnosed hypercholesterolemia were excluded. In both populations fasting blood samples were collected to evaluate the lipid profile. Physical activity was assessed using the International Physical Activity Questionnaire (IPAQ). Usual dietary intake was assessed by a multiple-source method from two 24-h dietary recalls and food frequency questionnaires. Descriptive analysis was used and differences in means using t-test statistics were tested for significance.
RESULTS
Mean usual total dietary fat intake was higher in NH residents (36.1 % vs. 33.25 % of total energy intake), as well as mean usual daily saturated fat intake (13.3 % vs. 9.0 % of total energy intake). Mean S-cholesterol (4.77 vs. 5.45 mmol/L) and HDL cholesterol (1.2 vs. 1.5 mmol/L) were significantly lower in NH residents compared to CD elderly. Greater variability in lipid profile parameters was observed in NH residents. S-HDL levels in NH residents significantly increased with higher IPAQ score but not in CD. A trend of lower S-triglycerides was observed in both populations in those with high IPAQ scores compared to subjects with low IPAQ.
CONCLUSIONS
This exploratory analysis showed that NH residents had higher dietary fat and saturated fat intake compared to CD older adults, yet exhibited lower S-cholesterol and S-HDL cholesterol levels. The association between physical activity and lipid profile in NH residents highlights the role of lifestyle factors. Further research is needed to confirm these findings and explore the interactions between diet, physical activity, and lipid profiles in vulnerable older adults.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_280

INTAKE OF SIMPLE SUGARS FROM FLAVORED AND CARBONATED BEVERAGES, SUBCUTANEOUS ADIPOSITY IN YOUNG PEOPLE AND ASSOCIATED FACTORS

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BACKGROUND AND OBJECTIVES
Flavored and carbonated beverages are constituted by large amounts of sugars and their intake in adults is very frequent, they represent a high source of simple sugars. Their excessive consumption generates an accelerated intake of calories that can displace the intake of other macronutrients and contribute to the development of adiposity, which potentially increases cardiometabolic risk. Given the relevance of this background, the aim of this study was to analyze the association between the intake of simple sugars from flavored and carbonated beverages on subcutaneous adiposity in young Peruvians, considering sociodemographic factors and the average time spent in sedentary activities.
METHODS
A cross-sectional correlational study was conducted with a sample of 382 students from public universities. The consumption of sugar-sweetened beverages was assessed by means of a previously validated food consumption frequency questionnaire, complemented with the 24-hour recall technique. A univariate and bivariate analysis was performed in the SPSS program (version 26). Spearman's Rho coefficient was used to evaluate correlations. Statistically significant values were interpreted in terms of magnitude and direction (positive or negative) to identify general patterns and highlight the most relevant findings in the overall context of the study.
RESULTS
The prevalence of overweight was 69.6 % (according to body fat percentage), the median age of those evaluated ranged from 20 to 23 years, the average sitting time of students was 8 hours on a weekday, the intake of carbonated beverages was higher, 405.4 ml/day (average), which represents 8.2% of simple sugars based on a 2000kcal diet. However, only the fruit-flavored beverage presented significant negative correlations in specific contexts: moderate physical activity, less time sitting, residence in Lima and non-poor socioeconomic level.
CONCLUSIONS
The RESULTS suggest that fruit-flavored drinks are associated with less healthy lifestyles and may be more popular among people with sedentary lifestyles, in lower socioeconomic contexts and living outside Lima.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_281

THE IMPACT OF A NUTRITIONAL EDUCATIONAL INTERVENTION ON NUTRITIONAL KNOWLEDGE AND DIETARY INTAKE IN FEMALE HANDBALL ATHLETES

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BACKGROUND AND OBJECTIVES
Proper nutrition enhances athletes' performance and recovery during sports activities (1). Various factors affect the athlete's diet, including nutritional knowledge (2). Specifically, the level of nutritional knowledge attained by an athlete positively affects their dietary behavior (3). Studies report that female athletes have low levels of nutritional knowledge and insufficient dietary intake to meet their nutritional requirements (3-5). The objective of this study was to evaluate the effects of a nutritional education program on nutritional knowledge and dietary intake among female handball players..
METHODS
A quasi-experimental intervention design with pre- and post-intervention assessments was implemented. The intervention consisted of a nutritional education program included 6 in-person group sessions, each lasting 15 minutes, over a 3-week period. Forty-seven female handball players (mean age 17.5 ± 2.1) participated. Nutritional knowledge (NUKYA questionnaire), dietary intake (3-day record) and adherence to the Mediterranean diet (Kidmed Index) were assessed.
RESULTS
Forty-one players completed the NUKYA questionnaire, and an increase in the score before (22.0 ± 16.1) and after the educational intervention (42.7 ± 16.4) of 20.7 points was observed, which was statistically significant ($p<0.001$). The effect size assessed with Hedges' g indicates that the effect was substantial (>0.8). It is noteworthy that the four items assessed in the questionnaire (macronutrients, micronutrients, hydration and periodicity) registered a significant increase in their scores. Thirty-seven female players completed the dietary record and it was observed that at the beginning of the study, most of the players were at risk of not meeting their needs for calcium, zinc, vitamin C, D and E, according to the average requirement published by the EFSA or DRIs. In the follow-up phase, a significant increase in calcium intake was observed ($p=0.0095$). A total of 83% of the players needed to improve their adherence to the MD.
CONCLUSIONS
Therefore, we recommend the implementation of nutritional educational interventions in sports clubs as a strategy to improve nutritional knowledge and nutrition of athletes. However, it is essential to continue researching and evaluating innovative educational methodologies that allow increasing the consumption of all critical micronutrients that are usually deficient in this population, thus contributing to a more comprehensive and adequate nutrition for sports performance.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_282

THE REGULATION OF THE WORKFORCE QUALIFICATION BY THE BRAZILIAN NATIONAL FOOD AND NUTRITION POLICY: CHALLENGES FOR UNDERGRADUATE COURSES IN NUTRITION

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BACKGROUND AND OBJECTIVES
The Brazilian National Food and Nutrition Policy (PNAN), published in 1999, is part of a set of actions, laws, policies, plans, programs, projects, information systems and research that emphasize health and food as a right for all Brazilians. The PNAN is part of the the the Brazilian Unified Health System (SUS) and has a guideline regarding the qualification of the national health and nutrition workforce. The objective of this work is to explore how the Brazilian National Food and Nutrition Policy (PNAN), as a health and nutrition public policy, is being contemplated in the academic training of nutritionists, especially in the Undergraduate Nutrition Courses.

METHODS
An exploratory and qualitative research was carried out with the specific objectives of (a) identifying and systematizing the legal arrangement for the regulation of the qualification of the health workforce in the areas of food and nutrition; (b) identify and describe the regulation of the Undergraduate Nutrition Courses, as well as how they are articulated with the PNAN.
RESULTS
There is a relevant legal arrangement to regulate the qualification of health and nutrition workforce in the e Brazilian Unified Health System (SUS) through a set of several tipes of norms and legislation. There is little literature on the assessment of the presence of the PNAN and of food and nutrition security in the undergraduate nutrition courses. These courses still have a curriculum with a predominantly biological approach of nutrition, that does not harmonize with the approach to health and nutrition from a biological, psychological and social perspective that is the foundation of the PNAN, the Brazilian Unified Health System (SUS) and the National Food and Nutritional Security System (SISAN).
CONCLUSIONS
Graduation in nutrition becomes increasingly complex and challenging as it has to contemplate the population's health needs and the Unified Health System (SUS) demands to perform on different fronts of the food system, including food and nutritional security. The intersectoral approach and institutional articulation are essential for the consecution of the PNAN's strategic lines, especially fot the guideline of qualification of the workforce to be reflected in undergraduate nutrition courses.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_283

BODY FAT AND MEDITERRANEAN DIET ADHERENCE AMONG NATIVE AND IMMIGRANT CHILDREN: THE ASOMAD STUDY

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BACKGROUND AND OBJECTIVES
The rising prevalence of childhood obesity is a major public health concern influenced by dietary habits and cultural factors(1). This study aimed to assess body fat percentage (%BF) in children and examine the impact of sex, age, origin, and adherence to the Mediterranean Diet (MDA), with a particular focus on immigrant children.
METHODS
A cross-sectional study was conducted in the fall-winter of 2020, 2021, and 2022. The study employed a cluster random sampling method to obtain a representative sample of school-aged children aged 8 and 12 years. %BF was measured using bio-impedance analysis. MDA was assessed using the KIDMED questionnaire(2). Parental origin was considered (birthplace in Spain or elsewhere "specified"). High %BF was defined as BF> 90th percentiles (3). Obesity and overweight (OW/OB) were classified according to the International Obesity Task Force (IOTF) guidelines(4). Statistical analysis involved t-test to compare %BF and KIDMED score among groups, employing Chi-square tests to evaluate differences in obesity prevalence, and utilizing a logistic regression to determine risk factors for the high BF, all with a 95% confidence interval (CI).
RESULTS
The sample consisted of 578 children (54% boys, mean age 9.54±1.19 y). One third of the participants were of immigrant origin, with at least one parent born outside Spain. %BF of the overall sample was 20.82±7.23. The threshold for %BF at the 90th was 31.3%, logistic regression revealed significant associations between sex, age, origin of parents and high %BF. Parental origin was strongly associated OR=3.631, 95% CI [1.983 - 6.647], p<0.001, suggesting an increased risk in children of immigrant origin. Children aged 10y OR = 3.047, 95% CI [1.407 - 6.599], p = 0.005, and 11y OR = 2.915, 95% CI [1.283 - 6.623], p=0.011 groups also presented increased risk. Sex showed a trend toward association OR=1.728, 95% CI [0.945-3.160], p=0.076, although not statistically significant. Immigrant children exhibited significantly higher mean %BF compared to Spanish children (23.65±8.05 and 19.42±6.34 respectively, p<0.001). Furthermore, the prevalence of excess weight was significantly higher among immigrant children 38.5% vs 17.9%, p<0.001. Interestingly, no significant differences were observed in KIDMED scores between both groups, suggesting similar MDA.
CONCLUSIONS
The study highlights the complex interplay of factors influencing childhood obesity, emphasizing the need for culturally tailored interventions, particularly for immigrant.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_284

THE “SUN” STUDY: COHORT PROFILE UPDATE AFTER 24 YEARS OF FOLLOW-UP

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BACKGROUND AND OBJECTIVES
The “X” project is an open-enrolment cohort in “X”, consisting of 23 321 university graduates, 61.5% women. It was originally set up in December 1999 to investigate the association between the Mediterranean dietary pattern and other lifestyle-related factors in relationship with the risk of chronic diseases. Retention rate is 90.6%. Several new areas of research have been developed: mortality, well-being, validations and confirmations of different diseases, SARS-CoV-2, and development of diverse several scores (lifestyle, oxidative, macronutrient quality, Paleo-Diet, sustainable diet, dietary obesity-prevention and diabetes prevention and dietary-based diabetes-risk).
METHODS
Participants are university graduates from the X and other X universities, as well as members of different professional associations. Biological collection samples began in 2008. Saliva samples are requested from a subpopulation of participants aged 55 years and over, for a sub-study on dementia (n=1827). The baseline questionnaire collects information on participants’ sociodemographics, anthropometrics, diet (through a previous validated food frequency questionnaire (FFQ), eating behaviors, lifestyles, clinical data, preventive measures, medications, and personality traits. Follow-up questionnaires are sent to participants every two years. They focus on changes in food habits, diagnosis of new diseases, quality of life, drugs, personality test, and Psychological Well-Being (Ryff scale). Some of the items were repeated over time, like the FFQ assessed at baseline, at 10-year and 20-year follow-up.
RESULTS
The more relevant findings to date are the following: a high MedDiet adherence is associated with a reduced incidence of all-cause mortality, fatal and non-fatal major cardiovascular disease (CVD), type 2 diabetes, weight gain, metabolic syndrome, depression, cognitive decline, and nephrolithiasis. An inverse dose-response relationship was found for many of these associations. By contrast, a higher consumption of ultra-processed foods was independently associated with a relatively increased hazard for all-cause mortality.
CONCLUSIONS
Up to date 312 publications with data from de SUN project have been published. These publications support our initial hypothesis that the adherence to a Mediterranean dietary pattern, rich in virgin olive oil, fruits, vegetables, whole-grains, fish, and poor in ultra-processed foods, red meats, binge drinking, sedentary life could protect against suffering from different diseases.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_285

EXPLORING PUPILS' PERCEPTIONS OF SCHOOL MEAL PROVISION AND THE SCHOOL CANTEEN ENVIRONMENT IN NORTHERN IRELAND: THE CANTEEN STUDY

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BACKGROUND AND OBJECTIVES
Schools provide a convenient, accessible eating environment for pupils, which can help facilitate healthier eating habits. Beyond the nutritional benefits, school meals may have a positive impact on pupil wellbeing, learning, concentration and academic outcome.(1) However, despite the benefits, encouraging school food uptake remains a challenge. To further understand the factors affecting uptake, this research assessed the perceptions of secondary school pupils towards both school food provision and the canteen environment.
METHODS
The research is based on data collected from 820 pupils (12yr olds n=428; 15yr olds n=392) recruited from 17 secondary schools in Northern Ireland, as part of the CANTEEN study, an ongoing cross-sectional study which aims to evaluate the effectiveness and cost-effectiveness of the means-tested Free School Meal policy in UK secondary schools (England and Northern Ireland) on diet and food insecurity and the factors associated with uptake. Pupils completed an online survey, which included statements about perceptions of school food and the canteen. Responses were measured on a 5-point Likert scale (rated from strongly agree to strongly disagree). Data were analysed using descriptive statistics.
RESULTS
In general, perceptions about the canteen were more positive than negative. From a social aspect, 92% of pupils agreed or strongly agreed that they were able to eat with their friends. More than twice as many girls (19%) than boys (8%) agreed/strongly agreed that friends influenced what they ate ($p<0.001$). More boys than girls were positive (agreed/strongly agreed) about the taste (57% vs. 40%) and variety of foods (61% vs. 45%) (both $p<0.01$). Over half (58%) agreed/strongly agreed that the canteen catered for the dietary needs of all pupils. Perceptions about the canteen environment and the staff were positive, with more than half viewing the canteen as a clean (58% agreed/strongly agreed), happy place (56%) with adequate seating (82%) and helpful staff (76%). Perceptions regarding the menu and costs were less favourable with less than half agreeing/strongly agreeing that foods were clearly priced (37%), that the menu was available in advance (44%) and that foods offered were good value for money (41%). Most pupils (69%) queued for <10 minutes for food however, almost half of the girls (47%) and one third of boys (35%) felt rushed when buying food. Despite this, most pupils (60%) felt that they had enough time to eat their meal.
CONCLUSIONS
Understanding pupils' perceptions of school food and the canteen is important for informing school food policy and for improving the delivery, acceptability and uptake of school food.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_286

EFFECTIVENESS OF MULTI-MICRONUTRIENT POWDERS AND HEALTH EDUCATION COMMUNICATION ON NUTRITIONAL STATUS OF VIETNAMESE CHILDREN 6-11 MONTHS OLD

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BACKGROUND AND OBJECTIVES
Infants from 6 to 11 months old are noted with high prevalence of malnutrition, related to the fact that complementary diets provided not adequate child's needs of nutrients that might be seen popular in rural areas with limited economic conditions, knowledge, health care and nutrition practices. This study was conducted to evaluate the effect of multiple micronutrient powders (MNPs) and health education communication on micronutrient status in Vietnamese infants 6-11 months old.
METHODS
360 infants 6-11 months old participated in the intervention, divided into 2 groups according to anthropometric indicators, age in months and gender. The intervention group supplemented the multi-micronutrient package MNPs Bibomix, 1 package/1 day; 5 packages/1 week, consisting of 15 vitamins and minerals, combined with nutrition communication, the control group used a placebo package and nutrition communication, for 12 months. Anemia and iron deficiency are identified following World Health Organization guidelines. Low serum zinc concentration is defined by a serum zinc concentration <9,9µmol/L.
RESULTS
After controlling for confounding factors, the intervention clearly showed the effect of the intervention in children on hemoglobin, ferritin, and serum zinc concentrations ($p<0.05$). The mean hemoglobin concentration after 12 months of the intervention group increased by 4.36 (g/L) ($p < 0.001$) compared to the control group; The prevention effect on anemia in children was 6.7% (95%CI: 2.2; 11.2) ($p < 0.01$); The average ferritin concentration after 12 months in the intervention group was 7.44 (µg/L) higher than the control group ($p < 0.001$). The effectiveness of preventing iron deficiency in children was 7.8% (95%CI: 3.1; 12.4) ($p < 0.001$). The average zinc concentration after 12 months in the intervention group was 0.38 (µmol/L) higher than the control group ($p < 0.01$); The effectiveness of preventing low serum zinc concentrations in children was 18.5% (95%CI: 6.2; 30.8), ($p < 0.05$).
CONCLUSIONS
Fortification of multi-micronutrient powders into complementary foods at households combined with counseling on child feeding and health care have remarkable improved the iron and zinc status and reduced prevalence of anemia among children after 12 months of the intervention. It should be replicated in areas with high risk of childhood micronutrient deficiencies.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_288

FISH CONSUMPTION AND BODY COMPOSITION IN CHILDREN IN A MEDITERRANEAN DIET FRAMEWORK: THE ASOMAD STUDY

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BACKGROUND AND OBJECTIVES

The Mediterranean Diet (MD) is recognized as one of the healthier dietary patterns worldwide (1-3). The objective of this study was to evaluate the relationship between fish intake, an essential element of the MD, and body composition in school-aged children.

METHODS

A cross-sectional study was conducted during the academic years 2020-2022. The sampling was randomized in clusters to obtain a representative sample of children aged 8 to 12 years. Anthropometric indices for body composition including body mass index adapted by age and sex (BMI-z), waist circumference (WC), waist to height ratio (WHtR), and body fat percentage (BF%) were measured following standard guidelines. Overweight and obesity (OW/OB) were determined according to the International Obesity Task Force (IOTF (4). Adherence to the MD was assessed using the KIDMED questionnaire (5), focusing on fish consumption item. For statistical analysis, Students-t was utilized to compare anthropometric indices between two groups based on fish consumption (consumers vs. non-consumers), and Chi-square tests were conducted to examine the association between fish consumption and OW/OB prevalence.

RESULTS

578 children were recruited (mean age 9.54±.19; 46% females). Those consuming fish at least 2-3 times a week 68% showed significantly lower BMI z-scores, WC, WHtR, and %BF compared to those who did not (mean = 0.416 ± 1.015 vs 0.77±1.13 ; 60.75 ± 8.32 vs 64.11±10.28 cm; 0.44 ± 0.05vs 0.46 ± 0.06; 20.14 ± 6.96 vs 22.29 ± 7.59%, respectively; all $p<0.001$). Significant differences were found in all anthropometric measurements in boys ($p<0.05$), while among girls only WC was different ($p<0.05$). A significant association between fish consumption and OW/OB prevalence was found ($\chi^2 = 15.820$, df = 2, $p<0.001$). The prevalence of OW/OB was higher in the group that did not consume fish regularly compared to the group that did (24.3% and 10.8% vs 13.5% and 6.4%, respectively).

CONCLUSIONS

These findings suggest that the regular consumption of fish at least 2-3 times per week could contribute to healthier body composition among children, potentially contributing to the prevention of OW/OB in this population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_289

ARE THE GLOBAL SODIUM BENCHMARKS ACHIEVABLE FOR VARIOUS FOOD PRODUCT CATEGORIES AVAILABLE ON THE LOCAL MARKET IN VOJVODINA, SERBIA?

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BACKGROUND AND OBJECTIVES
Reducing salt intake is a critical global public health objective due to its role in preventing cardiovascular diseases and hypertension. In alignment with efforts to address these concerns, the World Health Organization (WHO) emphasizes the importance of establishing global sodium benchmarks (GSB) and promoting food reformulation across diverse food categories. The overarching goal is to mitigate the burden of diet- and nutrition-related noncommunicable diseases (NCDs) and to achieve a 30% relative reduction in average population salt intake, ultimately aiming for a daily intake of less than 5 g of salt (equivalent to <2 g of sodium). This study addresses the sodium content in food available on the local market in Novi Sad, Serbia.
METHODS
The analytically determined sodium content of 2,349 food samples from 10 food categories divided into 43 subcategories was used to assess their compliance with established sodium reduction standards.
RESULTS
The assessment revealed that, within the range of established minimum values across a total of 43 subcategories, 31 (72%) subcategories achieved global sodium benchmark (GSB) values, while the remaining 12 (28%) subcategories did not meet the GSB. These included pizzas, various types of bread, dry instant soups, ripened cheeses, and the majority of processed deli meat subcategories. In 11 subcategories, the average sodium content met the GSB, including 5 subcategories within the sweet products category, specifically biscuits and similar items.
CONCLUSIONS
The majority of the categories and subcategories evaluated did not meet the target values, highlighting significant challenges in reducing salt content across diverse food products. While some categories showed progress, others remained well above the recommended levels. These findings underscore the need for sustained industry commitment, public health initiatives, and mandatory measures to further reduce salt intake and achieve global health objectives, as part of national and regional efforts to decrease population salt consumption.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_292

IMPACT OF A DIETARY GUIDELINES BOOKLET FOR INFANTS AT COMPLEMENTARY FEEDING AGE ON THEIR NUTRITIONAL STATUS

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BACKGROUND AND OBJECTIVES
Inadequate nutritional quality of complementary feeding (CF) is one of the most highlighted reasons for infant undernutrition in Sri Lanka. Hence, this study was conducted to evaluate the impact of a developed dietary guidelines booklet for infants at complementary feeding ages of 6 to 12 months on their nutritional status.
METHODS
A developed dietary guidelines booklet for infants includes appropriate food and CF mixes with nutritionally adequate menus. The impact of the booklet on the nutritional status of infants at CF age was assessed through pre- and post-intervention assessments. For the CF intervention, 42 infants from each Maternal and Child Health (MCH) clinic at Pannala and Kuliyapitiya were recruited. Baseline data on socio-demographics, birth weight, length, and feeding information were collected. The intervention group received the developed CF booklet, while the control group received routine information from MCH clinics. Anthropometric and dietary intake data, excluding socio-demographic data, were collected when the infants were at 9 months and 12 months old. Weight-for-age, length-for-age, and weight-for-height z-scores were computed using WHO Anthro Plus, and dietary intake from CFs was analyzed at baseline and the end of the intervention. The nutrient intake was identified using Food-Base 2000 software. Statistical analysis was performed using SPSS version 23.0 at $p < 0.05$ significance. At the end of the interventions, the differences within groups and between two groups were calculated using dependent and independent t-tests, respectively.
RESULTS
At baseline, there were no statistically significant differences in socio-demographic and nutritional status between infants in the intervention and control groups ($p < 0.05$). The mean difference of z-scores for length-for-age ($p = 0.01$), weight-for-age ($p = 0.042$), and weight-for-height ($p = 0.000$) was significantly higher in the intervention group at the end of the intervention. The prevalence of stunting decreased from 7.5% to 5%, wasting from 12.5% to 5%, and underweight from 11.5% to 7.5% in the intervention group at the end. The energy, protein, calcium, iron, thiamine, folate, vitamin A, and iodine intake of the infants in the intervention group were significantly improved in the middle (9 months) and end (12 months) of the intervention compared with infants in the control group.
CONCLUSIONS
This study concluded that the CF guidelines booklet impacted the improvement of the nutritional status of infants with CF aged 6–12 months in Sri Lanka.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_293

ASSESSING THE IMPACT OF SOCIAL NEEDS ON DIETARY HABITS AND PHYSICAL ACTIVITY AMONG LATINO FARMWORKERS

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BACKGROUND AND OBJECTIVES
In the United States Latino farmworkers large number of social needs (food insecurity, housing instability, transportation issues) that lead to a host of cardiometabolic dsparities. To evaluate the impact of social needs on dietary habits and leisure-time physical activity (LTPA) among Latino farmworkers in a rural community.
METHODS
This study analyzed data from a cross-sectional study leveraging a community engaged approach, where participants completed surveys assessing their LTPA and dietary habits. Three psychosocial factors were examined as predictors: social risk scores, acculturation level, and PHQ-4 scores. Social risk scores were assigned based on survey responses. Acculturation levels were categorized as ‘No acculturation’ or ‘Some acculturation,’ and PHQ-4 levels were classified as ‘Normal’ or ‘Mild-Moderate.’ Logistic regression was used to explore the relationships between these psychosocial predictors and participants' dietary and physical activity behaviors. The study was conducted in the US-Mexico border region. The analysis focused on survey responding who were 18 years of age or older, not pregnant, and currently engaging in agricultural labor.
RESULTS
In total 100 participants were enrolled in the study and assessed for measures, with over 90% being of Mexican-origin, 70% female, and over 60% reporting at least one social need. One significant result with a p-value of 0.011 ($p < 0.05$), indicated that having three or four social risks increased the odds of reporting a ‘Good’ perceived dietary rating by six times (OR 6.000, 95% CI 1.501 – 23.991) compared to those with zero social risks.
CONCLUSIONS
These RESULTS indicate that resiliency among farmworkers is a large factors to continuous engaging in good dietary habits. This is also rooted in socioeconomics in having to engage in healthier eating, given that for several participants getting "fast food" is a luxury, which is rooted in the Latin American where fast food chains are more expensive then cooking more nutritious foods at home.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_294

THEORETICAL MODELS OF SELF-REGULATION APPLIED IN THE CONTEXT OF EATING BEHAVIOUR

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BACKGROUND AND OBJECTIVES
Behavioural skills, such as eating self-regulation, are suggested to help achieving and maintaining healthy eating habits in obesogenic environments. The mechanisms of self-regulation vary across models. This study aims to analyse self-regulation models, focusing on their mechanisms and components to understand how they influence eating behaviour.
METHODS
Six descriptors from the MeSH were selected: theoretical models, anthropometry, self-regulation, and eating behaviour. The search was conducted in the PubMed, SciELO, and Scopus databases without restrictions regarding the publication period and languages.
RESULTS
This review found 4 theoretical models extensively cited on the literature. The Feedback Loop Model, proposed by Carver and Scheier (1990), is one of the leading theories conceptualizing self-regulatory skills as a process of establishing goals and adjusting patterns of behaviours to attain those goals, using informational feedback as a guide. Bandura's (2005) Social-Cognitive Theory emphasizes that the main self-regulatory mechanisms are the adoption of goals and planning a course of action, self-monitoring the behaviour, and self-reaction influences. Schwarzer's (2008) Health Action Process Approach model suggests self-regulatory skills are required in the post-volitional stage to achieve the intended health behaviour, involving three phases: planning; action control and maintenance. It addresses aspects of self-regulation not covered by the previous models, such as how people determine their plans to achieve their intentions and strategies to deal with barriers along the way. Although these models are relevant, none fully captures all the self-regulation processes and skills specifically related to eating behaviour. Based on this, Kliemann et al. (2017) proposed a model of self-regulation of eating behaviour, which integrates existing theoretical models and emphasizes self-regulation as a continual reflective and/or automatic and multi-level process of self-monitoring; appraising progress and attempting to approach or maintain the desired eating goal, making adjustments to it when necessary or giving up. It may also involve the capacity to control thoughts, attention, behaviour and emotion to overcome dietary barriers and temptations along the way.
CONCLUSIONS
The general self-regulation models analysed provide valuable perspectives but do not specifically address eating behaviour. The model by Kliemann et al. (2017) fills this gap by integrating existing theoretical elements, facilitating the understanding of self-regulation process in the context of nutrition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_296

PROTECTIVE FACTORS OF BREASTFEEDING OF INFANTS BORN IN A MATERNITY OF DOURADOS/MS

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BACKGROUND AND OBJECTIVES
Breastfeeding is a worldwide disseminated and encouraged practice through various policies, initially promoted by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) with the aim of reducing the “weaning epidemic” that is consolidating in a global context and is impacting the children's health and infant mortality.This research aimed to investigate the factors associated with the protection of breastfeeding up to six months postpartum in women treated at a Maternity Hospital in Dourados/MS.
METHODS
This is a quantitative and observational descriptive study that evaluated data from interviews carried out with postpartum women and their children born in the Women's Unit of the University Hospital of the Federal University of Grande Dourados. This Study occurred between the months of August to December 2023. The evaluation form It was structured in an online format and sent to the volunteers via Whatsapp. Statistical analysis was performed using the G Test, associated with Williams and Yates correction. Multiple logistic regression analysis was performed to infer the effect on the association between the variables. The sample included the participation of 121 binomials, the RESULTS were obtained from the comparison between two groups, one that breastfed for a period equal to or less than six months and the other that breastfed for more than six months.
RESULTS
The comparison between the two groups showed statistical significance in the variables of breastfeeding in the hospital and use of formula during hospital (p=0.0307; p=0.0018), Exclusive Breastfeeding (EBF) in the first six months (p=0.0028) and use of bottles and pacifiers (p=0.0048; p=0.0004). When analyzed in logistic regression, the variables that remained a protective factor for breastfeeding up to six months were not using formula during hospitalization (OR 4.95; p=0.0160) and not using a pacifier (OR 3.26; p=0.0082).The guidance on breastfeeding during the hospitalization did not present significant statistical differences in the breastfeeding maintenance (0.8808).
CONCLUSIONS
Although receiving breastfeeding guidance during hospitalization did not related with the protection of breastfeeding, it must be acknowledged that the aspects that negatively impact the practice of breastfeeding are modifiable, therefore, attempts to manage these factors must be applied throughout the pregnancy-puerperal period, starting as early as possible.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_299

PERCEIVED FOOD ENVIRONMENT AND ASSOCIATION WITH OVERWEIGHT IN ADOLESCENTS

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BACKGROUND AND OBJECTIVES

Obesity is considered a public health problem worldwide, leading to severe health consequences and generating high costs for the government and society. Schools are where children and adolescents spend a significant part of their day, and therefore, the school food environment can play a crucial role in preventing obesity and promoting public health. The aim of this study was to evaluate the association between the perceived school food environment and physical activity, and overweight among adolescents.

METHODS

This is a quantitative cross-sectional study conducted with 828 adolescents from public schools in a capital city in northeastern Brazil. The perceived school food environment (AAEp) was based on the translated version of the Nutrition Environment Measures Survey in Stores (NEMS-P) tool, which assesses consumer-focused aspects of the food environment and identifies barriers and facilitators for acquiring healthy foods. All questions were contextualized for the school environment, creating an integrated tool to assess the AAEp. Responses were presented according to the presence or absence of overweight, using the chi-square test to compare the groups, with a 5% significance level.

RESULTS

The participants were aged between 11 and 18 years, predominantly female (53.9%), and of mixed race (55.3%). Overweight was present in 38.2% of the adolescents, with 16.3% of them being obese. Only 3.5% of the students were underweight, and 58.3% were of normal weight. Most adolescents considered the school food environment to be unhealthy, as they disagreed with the statements: it is easy to buy fresh fruits and vegetables (62.4%); fresh fruits, vegetables, and legumes are of good quality (72.8%); there are many options of fresh fruits and vegetables (69.2%); it is easy to buy low-fat products (76.6%); low-fat products are of high quality (82.2%); and there are many options of low-fat products (82.1%). No significant differences were found between adolescents with and without overweight.

CONCLUSIONS

Despite this, it was concluded that adolescents mostly had an unfavorable perception of the school food environment, which was linked to a high proportion of overweight, emphasizing the need for a better understanding of this relationship and its health-related outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_300

DIETARY DIVERSITY IN ADOLESCENTS WITH OBESITY

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BACKGROUND AND OBJECTIVES

An inadequate intake of food groups is a determining factor in the rise of obesity in adolescents. In this context, the Food and Agriculture Organization of the United Nations (FAO) recommends using the Household Dietary Diversity Score (HDDS) as an indicator of dietary diversity and quality. The aim of this study was to assess dietary diversity in adolescents with obesity and its association with sex.

METHODS

This was a quantitative cross-sectional study including 142 adolescents, aged beteween 10 and 14 years, diagnosed with obesity, from public schools in Brazil. Weight and height were measured to calculate Body Mass Index (BMI)-for-age, and a 24-hour food recall was collected to evaluate dietary diversity using the HDDS. The score consists of a count of 12 food groups, with 1 point being scored for each group present in the diet. The final score was classified as low dietary diversity (≤5), medium dietary diversity (6-8) or high dietary diversity (≥9). Sex-based comparisons were performed using the Student's T-test or Mann-Whitney, according to the distribution of the data, and the association was assessed using Pearson's chi-square test.

RESULTS

The participants had a mean age of 12.4 years, with a slight majority being male (53,5%). When assessing intake by food groups, males had a higher percentage of consumption of legumes, nuts and seeds (**p=0,006**); and milk and dairy products (**p=0,042**).

Table 1. Evaluation of HDDS between the sexes in adolescents from public schools.

Variables	Total (n=142)	Males (n=76)	Female (n=66)	p-value
BMI, kg/m², medium (SD)	29,14 (3,76)	28,66 (3,93)	29,68 (3,52)	**0,029**[a]
HDDS, medium (SD)	6,46 (1,82)	6,67 (1,93)	6,21 (1,67)	0,206[a]
Low diversity, n (%)	44 (31,0)	22 (50,0)	22 (50,0)	
Medium diversity, n (%)	80 (56,3)	38 (47,5)	42 (52,5)	**0,005b**
High diversity, n (%)	18 (12,7)	16 (88,9)	2 (11,1)	

Significative p-value <5%. a- Mann-Whitney Test. b- Pearson's chi-square test. BMI: Body Mass Index; HDDS: Household Dietary Diversity Score; SD: standard deviation.

CONCLUSIONS

Adolescents with obesity exhibited a greater prevalence of medium dietary diversity. Male adolescents demonstrated higher dietary diversity compared to female adolescents, with greater consumption of legumes, nuts and seeds, and milk and dairy products.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_302

VALIDATION OF SENTINEL FOODS FROM CHILE'S DIET QUALITY QUESTIONNAIRE (DQQ) IN PREGNANT WOMEN

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BACKGROUND AND OBJECTIVES
The Diet Quality Questionnaire (DQQ) was developed as an easy and quick international tool for assessing diet through 29 sentinel food groups. However, this tool has not yet been validated for Chile, and sentinel food groups may need some adaptation. This study aimed to identify and propose adaptations for the sentinel foods in the Chilean version of the DQQ.
METHODS
Dietary data from 1,418 pregnant women was collected via 24-hour dietary recall (24HR) in 2020-2021 as part of the CHIMINCs-II cohort. First, we examined 36,625 foods and beverages consumed (>15 g) reported in the 24HR (reference method). We categorized each food and beverage into the 29 food groups of DQQ. To determine the most commonly consumed foods in each food group, foods were ranked in descending order according to their frequency of consumption, and cumulative frequencies were calculated to identify items contributing to 90% or more consumption within each group. Then, we compared the identified groups to the proposed sentinel foods of the DQQ.
RESULTS
Pregnant had a mean age of 28.5 years (sd 5.8), 53% having completed secondary education, and 38.9% having obese weight status. Seven of twenty-nine sentinel food groups did not achieve a 90% of consumption contribution. These food groups included whole grains (82.5%), legumes (88.8%), other sweets (51.4%), processed meats (85.1%), packaged ultra-processed salty snacks (46.9%), deep-fried foods (79.2%), and fast foods (43.5%). Proposed adaptations to improve the contribution to the groups include adding whole grain breakfast cereals to the whole grains group, broad beans to the legumes group, jam, jelly, and ready-to-eat pudding in other sweets, pâté to the processed meats, crackers to the ultra-processed salty snacks, fried chicken and handrolls to the deep fried foods, and include other fast food companies to expand the fast food group.
CONCLUSIONS
The Chilean DQQ was effective for identifying sentinel foods in Chilean pregnant women, but some adaptations might improve this tool. Further testing in other age groups, including children, adolescents, and adults, is necessary before using it to monitor diet at the national level.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_303

EXPLORING THE RELATIONSHIP BETWEEN NUTRITION, ZEARALENONE METABOLITES, AND MALE REPRODUCTIVE BIOMARKERS

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BACKGROUND AND OBJECTIVES
Zearalenone (ZEA) is primarily produced by *Fusarium* species and is mainly present in grains, as well as in animal feed and food products. ZEA has immunotoxic, genotoxic, and carcinogenic effects, and disrupts gastrointestinal and hormonal functions. As a non-steroidal estrogenic mycotoxin, it negatively impacts reproductive capacity by inhibiting the hypothalamic-pituitary-gonadal axis, which is essential for normal sex hormone synthesis and the regulation of spermatogenesis. The study aimed to evaluate the relationship between food consumption and selected biomarkers of male reproductive health in relation to ZEA levels in the plasma of men under study.
METHODS
A cross-sectional study was conducted in 2022, involving 90 men aged 18-49. Food intake was assessed using a validated semi-quantitative food frequency questionnaire (FFQ) covering the intake frequency of 145 food items. Evaluating reproductive biomarkers were seminogram and hormones such as total testosterone, FH, FSH and SHGB. ZEA presence and concentration in blood serum were determined through immunoaffinity column separation and high-performance liquid chromatography with mass spectrometry.
RESULTS
The serum ZEA levels in the men studied (N=51) averaged 1.728 ± 3.657 ng/mL, showing no correlation with analyzed semen parameters and a negative correlation with LH (r=-0.235). In men with abnormal sperm morphology, ZEA levels were positively correlated with the consumption of high-fat dairy products, fish and seafood, potatoes, fruits, nuts, legumes, refined cereal products, oils, sauces, pizza, salty snacks, and alcohol (r: 0.726-0.974, $p<0.05$). Cluster analysis extracted four main clusters. The cluster that contained ZEA also consisted of testosterone, LH, FSH, semen volume, non-progressive motility, and food products such as legumes, nuts, animal fats, vegetable oils and sauces.
CONCLUSIONS
The observed associations suggest that excessive ZEA exposure from specific food groups may adversely affect semen quality, particularly its morphology. These findings highlight the potential role of diet as a modifiable factor influencing ZEA's effects on reproductive function and underscore the need for further research to understand this relationship better.
This study was funded by the National Science Centre (grant no. 2021/05/X/NZ7/01309) and co-financed by the Minister of Science under the "Regional Initiative of Excellence Program".
CONFLICTS OF INTERESTS
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EPO5_304

HIGH LEVELS OF GLYCAEMIA AND BLOOD PRESSURE IN ADULTS ARE RELATED TO OVERWEIGHT IN ADOLESCENCE

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BACKGROUND AND OBJECTIVES

Obesity among adolescents is considered a global health problem and can lead to the development of metabolic disorders that tend to persist or worsen in adulthood. Our aim was to verify the association between nutritional status in adolescence and blood pressure and glycaemic levels in adulthood.

METHODS

This was a longitudinal study approved by the Human Research Ethics Committee of the Federal University of Viçosa (6.104.415). A total of 365 individuals were assessed in adolescence and fifteen years later in adulthood. Anthropometric assessment, electrical bioimpedance (Inbody270) and biochemical tests were carried out at both times, following a 12-hour fasting protocol. The BMI Z-score was calculated for age and sex in adolescence, and BMI in adults, classified according to the WHO, 2007 and 1998, respectively. Blood pressure was measured using an automatic inflation meter. Fasting glycaemia was measured by collecting 12 mL of blood by venipuncture. The Mann-Whitney test was applied to assess the relationship between nutritional status in adolescence and blood pressure and glycaemia in adulthood, using SPSS software (20.0), with a significance level of 5%.

RESULTS

The majority of individuals were female (68.5%; n=250), 21.9% (n=80) were overweight 9% (n=33) had changes in blood pressure and 1.1% (n=4) in glycaemia. The correlation test showed that the higher the BMI in adolescence, the higher the systolic blood pressure ($r=0.195$; $p<0.01$) and glycaemia ($r=0.151$; $p<0.01$) in adulthood. The Mann-Whitney ($p<0.01$) test indicated that overweight adolescents had higher median systolic blood pressure (Md: 120 mmHg; Min: 94 - Max: 152; $p=0.003$) and glycaemia (Md: 81 mg/dL; Min: 68 - Max: 104; $p=0.001$) in adulthood compared to normal weight adolescents (Md: 115 mmHg; Min: 82 - Max: 153 and Md: 80; Min: 60 - Max: 103, respectively).

CONCLUSIONS

The RESULTS of the study indicate that excess weight in adolescence is associated with higher levels of blood pressure and glycaemia in adulthood. These findings reinforce the importance of early interventions during adolescence to prevent lifelong metabolic and cardiovascular complications.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_306

ASSESSMENT OF NUTRITIONAL STATUS AND COMPOSITION OF MATERNAL MILK FROM NURSING MOTHERS DONORS FROM A MILK BANK

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BACKGROUND AND OBJECTIVES
Breast milk is a complex matrix of macronutrients and micronutrients that play crucial role in the multifaceted development of a Infant. The nursing mother's diet emerges as an intrinsic element, having a direct impact on the quality and composition of breast milk. Therefore, the objective of this study is to analyze the human milk nutritional composition , comparing it if with the nutritional status and composition of the diet of nursing mothers
METHODS
This is a cross-sectional study.The research took place in partnership with the Human Milk Bank from Dourados. The inclusion criteria were nursing mothers over 18 years old and between the 5th and 20th week of lactation. Data collection took place in 2023 through an interview, anthropometric assessment and a 24-hour recall and two food records. Milk should be collected after the first feeding in the morning, containing at least 50 ml of human milk sample. The samples were analyzed for energy content, macronutrients (carbohydrates, total lipids and total proteins), fatty acids and minerals (sodium, magnesium, potassium, calcium, iron, zinc and selenium. Statistical tests were carried out using SPSS software. To compare different groups, the Student's t test was used. The level of statistical significance will be 5% ($p<0.05$) in all analyzes performed.
RESULTS
In total, 25 milk donors agreed to participate in the research, 64% of the participants were between 30-39 years old.. A high percentage of overweight and obese women was observed (64%), as well as excessive weight gain during pregnancy (80%). Independent of body weight and diet consumption, nursing mothers presented a greater inadequacy of food consumption and, in general, breast milk presented a low amount of macronutrients and micronutrients, when compared to the literature (Lawrence e Lawrence,Holland et al, 1992). The relationship between nutritional status and diet with the macro and micronutrient composition of milk was not verified ($p>0,05$)
CONCLUSIONS
Although the relationship between nutritional status and food consumption with the nutritional composition of breast milk has not been verified, nursing mothers must be nutritionally oriented, as inadequate nutrition affects health and may affect milk donation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_308

THE LEVEL OF SOCIAL MEDIA INFLUENCE IS ASSOCIATED WITH DISORDERED EATING ATTITUDES, BODY DISSATISFACTION, AND LOW SELF-ESTEEM

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BACKGROUND AND OBJECTIVES

Adolescents are more susceptible to media influences in shaping body image and internalizing ideal appearance standards, which can affect body satisfaction, self-esteem levels, and the adoption of risk behaviors related to eating disorders. The aim of this study was to assess the association between the level of media influence, including social media, and body satisfaction, self-esteem, and eating attitudes in adolescents.

METHODS

This cross-sectional study was conducted with 828 Brazilian adolescents attending public schools in a city in northeastern Brazil. Media influence was assessed using the Sociocultural Attitudes Toward Appearance Questionnaire (SATAQ-3), classified as: Low (≤77), Moderate (78–94), and High (≥95 points). Self-esteem was measured by the Rosenberg Self-Esteem Scale, body satisfaction was evaluated using the Brazilian Silhouette Scale, and eating attitudes were assessed with the Disordered Eating Attitudes Scale. Poisson regression analysis was performed to evaluate the association between media influence levels and the outcomes (low self-esteem, body dissatisfaction, and disordered eating attitudes), adjusting for confounding variables (sex, age, socioeconomic status, and overweight).

RESULTS

Most of the adolescents were female (53.9%) and mixed-race (55.3%), aged 11 to 18 years. The higher the media influence (moderate and high, respectively), the greater the prevalence of low self-esteem (PR 1.54: 95% CI 1.20 – 1.98; PR 2.14: 95% CI 1.70 – 2.70), body dissatisfaction (PR 1.09: 95% CI 1.04 – 1.15; PR 1.15: 95% CI 1.09 – 1.21), and disordered eating attitudes (PR 1.11: 95% CI 1.05 – 1.18; PR 1.22: 95% CI 1.15 – 1.30), even after adjusting for confounding variables.

CONCLUSIONS

Higher levels of media influence are associated with lower self-esteem, body dissatisfaction, and disordered eating attitudes in adolescents. Our findings highlight the importance of preventive, educational actions, and conscious media use within public health frameworks, considering the effects of media influence on psychosocial and behavioral aspects during adolescence.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_309

PROMOTIONAL OFFERS OF A MEAL DELIVERY APP: A LOGITUDINAL STUDY IN BRAZIL

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BACKGROUND AND OBJECTIVES
Considering the widespread use of technology and the increase in the amount of time individuals spend online, the growing phenomenon of meal delivery apps (MDAs) has become part of the practice of purchasing food prepared outside the home in recent years This study aims to evaluate changes in the food offers of a delivery application for food prepared outside the home between 2021 and 2023, in a Brazilian metropolis.
METHODS
This is a longitudinal study that evaluated promotional offers of a food delivery app, in three time intervals and for seven consecutive days, in two periods: during the social isolation of the COVID-19 pandemic (2021) and at the end of the pandemic (2023). 14,363 promotional offers (6,021 in 2021 and 8,342 in 2023) in a food delivery app were evaluated.
RESULTS
The fast-food combo category represented the majority of offers in both 2021 and 2023, being offered more often at night. Sugar-sweetened beverages increased in 2023 (from 0.8% to 14.4%), although fast-food combos decreased (from 50.9% to 39.6%). There was an increase in the frequency of promotions of sweets and cookies and a decrease in the frequency of main meals and alcoholic beverages. The frequency of main meals was concentrated in the morning and afternoon in both years and, in 2023, on weekdays. The chance of offering ultra-processed food was 1.47 times higher on weekends and evenings compared to other days of the week and times of day.
CONCLUSIONS
There was an increase in the total number of promotional offers and, despite the reduction in fast-food combos, there was an increase in the offers of sugar-sweetened beverages and sweets and cookies, confirming that the digital food environment of delivery apps for food prepared outside the home resembles an obesogenic food environment.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_310

BASELINE AND QUALITATIVE EVALUATION OF A HEALTHY LIFESTYLE PROGRAM FOR A GROUP OF FAMILIES IN MEXICALI, BAJA CALIFORNIA

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BACKGROUND AND OBJECTIVES
Childhood obesity is a public health problem in Mexico, with disadvantaged families being the most vulnerable, so addressing it requires realistic and sustainable efforts. The purpose of this study was to evaluate the baseline parameters to characterize families at the beginning of the program, as well as to evaluate acceptability after the first stage of implementation.
METHODS
Four dyads of parents and children participated and underwent the following evaluations at the beginning of the program: anthropometry (e.g. weight, height and waist circumference); blood pressure and evaluation of biochemical parameters (e.g. glucose, total cholesterol, LDL, HDL and triglycerides). Likewise, 4 focus groups were conducted with the participants to evaluate the acceptability of the program after 10 weeks of intervention. Descriptive statistics were used for quantitative data, while qualitative information was processed by categories and themes.
RESULTS
Four female tutors and four children (50% female) participated in the measurements and focus groups. BMI values reported that three out of four female tutors were obese, while half (n=2) of the children were overweight or obese. 75% of the participants had an at-risk waist circumference; and 37% had an at-risk blood pressure reading. The total number of children (n=4) presented normal glucose values, but not cholesterol and triglycerides. Qualitative information from this first stage of the program shows good acceptance by the participants: “I feel that the program went beyond expectations. It exceeded them”. However, more practical activities are proposed: “it is preferable something more practical, like when we talked about sugar portions, the amount or how the percentage of sodium was taken out”. The participants would like to continue in the next stage of the program.
CONCLUSIONS
The need for programs to improve the quality of diet and physical activity in families is evident. The inclusion of parents in these programs will allow the adoption and maintenance of healthy behaviors.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_311

TITLE: IMPACT OF SUPPLEMENTATION WITH FORTIFIED BALANCED ENERGY–PROTEIN DURING PREGNANCY AND LACTATION ON INFANT GROWTH OUTCOMES IN SOUTHERN NEPAL: A COMMUNITY-BASED 2×2 FACTORIAL RANDOMIZED TRIAL

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BACKGROUND AND OBJECTIVES
Small size at birth and infant linear growth failure in the first 3-6 months of life are prevalent in South Asia where maternal undernutrition exists. Currently, the WHO recommendation is to provide balanced energy protein (BEP) supplements during pregnancy in settings with high (>20%) prevalence of low maternal body mass index (BMI). However, whether BEP supplementation during lactation in these settings can support women who breastfeed or benefit growth among infants who are exclusively breastfed for the first 6 months of life remains unknown.
METHODS
In rural Nepal, where the prevalence of low BMI is close to 30%, we recently completed an efficacy trial to test the impact of a fortified BEP supplement during pregnancy and lactation on birth outcomes and infant growth. The study was a 2X2 factorial, unblinded, household randomized efficacy trial in which 1,944 women were enrolled in early pregnancy and randomized to either daily fortified BEP supplementation or no supplementation (with all women receiving antenatal standard of care), and following a live birth at delivery, re-randomized (n=1,555) within each of the pregnancy arms to BEP vs. no BEP until 6 months postpartum. Birth anthropometry was conducted within 72 hours and subsequently infant anthropometry (length, weight, head, and mid-upper arm circumference) was assessed monthly until 6 months of age. The primary outcome of interest was infant growth at 6 months. Longitudinal data analysis will be conducted using mixed effects models to examine the independent and combined effects of pregnancy and lactation BEP supplementation on linear and ponderal growth in the first six months of life and to examine lactation effects independent of the pregnancy BEP supplementation effect on birth anthropometry.
RESULTS
The mean (SD) length and weight at 6 months of age was 64.6 (2.7) cm and 6604 (862) g in the control (unsupplemented arm). Length-for-age Z-scores (LAZ) improved in a small but incremental way in the first 6 months of life whereas weight-for-length z scores (WLZ) worsened, indicating increased wasting over the course of the six months. Stunting, wasting, and underweight prevalence at 6 months of age was 10.3%, 14.0% and 17.2%, respectively in the control group. Treatment effects of pregnancy and lactation BEP supplementation will be presented.
CONCLUSIONS
Our trial will show the impact of daily fortified BEP supplementation during pregnancy and lactation on growth in the first 6 months of life, informing policy and programs.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_312

FINDINGS FROM THE LEEDS SCHOOL BREAKFAST SURVEY

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BACKGROUND AND OBJECTIVES
Regularly eating a good quality breakfast during childhood and adolescence is consistently associated with increased diet quality and improved physical health outcomes, academic perfomance, and wellbeing(1,2,3). In Leeds, 25% of secondary, and 8% of primary school pupils report rarely, or never eating breakfast(4). School breakfast programmes present a practical means to overcome morning hunger in schools.
The objectives of the study were to i) map school breakfast provision across the city of Leeds; ii) evaluate the healthfulness of this provision; and iii) understand the motivators and barriers to providing a school breakfast.
METHODS
Data was collected using an online survey. Of the 292 schools approached, 170 completed the survey. The sample comprised: 139 primary schools, 23 secondary schools and 8 alternative provisions.
RESULTS
Breakfast was offered at 89% of schools. Primary schools emphasised offering breakfast to provide childcare, whereas secondary schools prioritised combatting hunger. Only 30% of schools provided their breakfast free of charge to all. Free breakfasts attracted a higher proportion of free school meal eligible pupils than paid-for provision. Findings also suggesed that current funding opportunities (e.g., National School Breakfast Programme(5)) are underutilised and do not fully cover schools' costs.
Around three-quarters of school breakfasts sdid not align with UK School Food Standards(6), despite most believing that they did. Primary reasons for this included not offering fruit and offering high-sugar items. Over 40% of schools reported that they would like more support on what foods to offer and how to increase uptake.
CONCLUSIONS
There is considerable scope to improve the healthfulness and accessibility of school breakfasts in Leeds.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_313

IMPACT OF THE PROMOTION OF RESPONSIVE FEEDING ASSOCIATED TO THE CONSUMPTION OF A FORTIFIED INFANT FLOUR ON THE FOOD AND ENERGY INTAKES OF YOUNG CHILDREN IN THE RURAL DISTRICT OF AMPARAFARAVOLA IN MADAGASCAR: A CLUSTER RANDOMISED TRIAL

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BACKGROUND AND OBJECTIVES
Insufficient intakes of energy and essential nutrients due to poor appetite will lead to growth faltering and stunting. Typically, intakes well below 30g/kg body weight/meal, the reference value for gastric capacity, are observed in young children living in regions with a high prevalence of stunting. We aimed to assess effects of responsive feeding promotion and the consumption of an energy-dense fortified complementary food, alone or combined, on meal intakes in young children.
METHODS
A four-arm cluster randomised controlled trial in infants, aged 6-7 months (n = 706) at recruitment, was conducted in a rural area of Madagascar. One group of infants (control) received only information on water sanitation and hygiene (WASH). In the other groups, additionally, infants received a daily portion of a fortified infant flour (FIF), or caregivers received repeatedly awareness of six key messages promoting responsive feeding (RF), or both (FIF+RF). Meal and energy intakes from a meal (either fortified porridge or a traditional dish) were measured at home in a subsample of 60 subjects per group, by weighing plate before and after consumption at recruitment (T0), and after 3, 6 and 9 months (T3, T6 T9).
RESULTS
Meal intakes were low (<15 g/kg BW/meal) in all groups and at all study times, even though they increased continuously with age. Meal intakes at T3 and T6 differed between groups ($p<0.01$ for both) when compared to control, with higher intakes at T3 in FIF+RF group and higher intakes at T6 in the RF group. At T9, the difference in intake between groups was no longer significant. Thanks to a higher energy density in FIF porridges than in traditional foods, energy intakes from FIF porridge were significantly higher at T3 and T6 compared to the control. However, the percentage of energy requirements from complementary foods remained below 20% at all study times in the intervention groups, indicating the need for at least 5 meals a day for 100% of requirements to be met.
CONCLUSIONS
Promoting responsive feeding increased intakes in children aged 9-10 months, but this effect diminished in children aged 12-13 months and was no longer noticeable in those aged 15-16 months. The higher energy density of FIF mitigated some negative effects of low intakes. Key messages on RF need to be adapted to age, taking into account changing food habits of older children whom seem less interested in porridges. Diversifying the range of fortified products could improve their utilisation.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_316

ASSESSING COMPLETENESS OF 24-HOUR URINE COLLECTION FOR ESTIMATION OF SODIUM INTAKE IN THE UK

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BACKGROUND AND OBJECTIVES
The measurement of sodium excretion in 24-h urine samples is the recommended method to assess dietary sodium intake necessary to establish population sodium intake and to monitor sodium-related public health policies to reduce cardiovascular disease. Ensuring complete collection of 24-h urine samples is important for the accurate assessment of sodium intake. Here, we compare the use of the objective biomarker, recovery of p-aminobenzoic acid (PABA), to self-reported 24-h urine completeness.
METHODS
Analysis was performed on data collected during the 2018/19 sodium survey as part of the UK National Diet and Nutrition Survey (NDNS). Data were available from 868 men and women aged 19 to 64 years. Self-reported 24-h urine completeness was based on collection duration between 23 and 25 h and no missed collections, together with a urine volume of $\geq$0.4 L.
RESULTS
The PABA protocol was adhered to by 812 participants of which 561 (69%) were deemed to have provided a complete 24-h urine collection. For the assessment of urine completeness by self-report, 619 (74%) provided a complete 24-h urine collection. Nine participants had a urine volume of less than 0.4 L and the remaining excluded participants were split between duration out of range and missed urine collections. Sodium excretion was 127 mmol/24 h with PABA and 126 mmol/24 h by self-report; salt intake was 7.40 g/d and 7.38 g/d, respectively. The proportion of participants above the WHO recommended salt intake of 5 g/d was 83.2% and 83.5% by PABA and self-report, respectively. Overall agreement was 66%. Of samples judged complete by PABA, 75% were also complete by self-report. Of samples incomplete by PABA, 43% were also designated incomplete by self-report.
CONCLUSIONS
Using data from a national survey, estimates of sodium intake in complete 24-h urine collections were similar whether 24-h urine collection completeness was assessed by PABA recovery or by participant self-report. Estimates of salt intake were not biased by self-reported 24-h completeness and this study therefore supports the use of self-reported urine collection in surveys of population sodium intake.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_319

EARLY LIFE EXPOSURES, CHILD HEALTH AND DEVELOPMENT – THE NEPTOX STUDY

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BACKGROUND AND OBJECTIVES
Exposures during critical periods of early life, such as the first 1,000 days, can disrupt organ development and long-term health outcomes. The NEPTOX study, conducted within a longitudinal cohort framework, seeks to evaluate environmental pollutant exposures during pregnancy and infancy and their interplay with nutritional, inflammatory, and genetic factors on child health and development. This study aims to generate evidence to inform risk assessments, policies, and interventions for vulnerable populations in low- and lower-middle-income countries (LLMICs).
METHODS
The study utilizes data from 800 mother-infant pairs in Bhaktapur, Nepal, nested within a randomized controlled trial (RCT) of daily vitamin B12 supplementation from 15 weeks of pregnancy to 6 months postpartum (NCT03071666). Children are now of school age, allowing for assessment of long-term outcomes, including neurodevelopment, vaccine response, thyroid function, growth and body composition, markers of non-communicable diseases (NCDs), and lung function. Biochemical analyses will include targeted metabolomics, vitaminomics, and trace element analysis, alongside measurements of environmental pollutants, epigenetic modifications, and telomere dynamics.
RESULTS
This study will generate high-quality longitudinal data integrating repeated biological samples (blood, breastmilk, and urine) with health, growth, and neurodevelopmental outcomes. Metabolic profiling will specifically assess the impact of micronutrients and metabolism on health trajectories, enabling a deeper understanding of the interplay between pollutantsand nutrition. Preliminary findings indicate that environmental and nutritional factors synergistically influence child health outcomes, highlighting key areas for targeted interventions.
CONCLUSIONS
The NEPTOX study provides a unique opportunity to advance the understanding of the interaction between environmental pollutants, nutrition, and child health in LLMIC settings. By leveraging transdisciplinary approaches and cross-sectoral collaboration, this project aims to inform guidelines and develop interventions to protect marginalized populations, contributing to UN Sustainable Development Goals 3, 4, 5, 9, 11, and 12.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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DAIRY PRODUCT CONSUMPTION AND ITS ASSOCIATION WITH MALE REPRODUCTIVE BIOMARKERS

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BACKGROUND AND OBJECTIVES
Dairy products are one of the main foods that provide the body with essential nutrients. However, their impact on reproductive health is still unclear. Studies confirm the beneficial association of low-fat dairy product consumption. However, further research is still needed to clarify the impact of full-fat dairy products. Therefore, the purpose of this study was to evaluate the association between dairy product consumption and biomarkers of male reproductive status.
METHODS
A cross-sectional study was conducted in 2022, involving 90 men aged 18-49. Food intake was assessed using a validated semi-quantitative food frequency questionnaire (FFQ) covering the intake frequency of 145 food items. Dairy products were grouped as low- and high-fat and low- and high-lactose ones. Evaluating reproductive biomarkers were seminogram in sperm and hormones such as total testosterone, FH, FSH and SHGB in blood serum.
RESULTS
The average total dairy product consumption was 352.9±230.3 g/day, with low-fat dairy products at 221.6±188.9 g/day and high-fat dairy products at 131.3±124.8 g/day. The average intake of low-lactose dairy products was 31.7±38.7 g/day, while high-lactose dairy product consumption was 316.7±225.7 g/day. No differences in dairy product consumption were observed between men with normal and abnormal semen parameters. A positive correlation was noted between the consumption of high-fat dairy products (r=0.271) and high-lactose dairy products (r=0.304) with progressive motility.
CONCLUSIONS
While no direct effect from dairy intake was observed, high-fat and high-lactose dairy products might be selectively beneficial for improving certain aspects of sperm quality. The observed correlations may suggest that certain components of high-fat and high-lactose dairy products, such as fatty acids, lactose, or micronutrients (e.g., calcium or vitamin D), could contribute positively to sperm motility. More studies are needed to confirm the observed correlations and explore the mechanisms behind the positive effects of high-fat and high-lactose dairy on progressive motility.
This study was funded by the National Science Centre (grant no. 2021/05/X/NZ7/01309), co-financed by the Minister of Science under the “Regional Initiative of Excellence Program” and "The Research Network of Life Sciences Universities for the Development of the Polish Dairy Industry–Research Project” of the Minister of Science Republic of Poland.
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INSIGHTS FROM COMMUNITY HEALTH WORKERS ON BARRIERS AND FACILITATORS TO IMPROVING MATERNAL NUTRITION IN RURAL BANGLADESH

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BACKGROUND AND OBJECTIVES
Behavior change communication (BCC) interventions to improve maternal nutrition (MN) have met with mixed success as adoption of MN behaviors often require material and social support from family members. Using focused ethnography, the present study analyzed emic perspectives of community health workers (CHWs) with experience in family-focused counseling to identify and describe family- and behavior-specific barriers and facilitators that affected CHWs' promotion and mothers' adoption of recommended MN behaviors.
METHODS
We interviewed 35 CHWs providing at-home nutrition education and counseling to rural pregnant women and their families in seven 'Alive & Thrive' intervention sites across two resource-poor Bangladeshi districts. Two card sorting exercises explored barriers and facilitators in promoting and perceived adoption of messages on maternal diet, rest, micronutrient supplements, and weight gain during pregnancy. Quantitative analysis based on how CHWs rated behaviors on scales of difficulty in promoting them and in their perceived adoption by mothers involved estimating correlation between average level of difficulty in promoting and in perceived adoption of a recommended behavior.
RESULTS
Poverty and unsupportive social norms emerged as key barriers for improving diet and rest while provision of free micronutrient supplements, at-home weight monitoring, regular CHW refresher trainings, and organizing husbands' forums emerged as overall facilitators of improved family engagement and CHW credibility. Quantitative analysis of sorting data revealed that behaviors that CHWs perceived as most difficult for mothers to adopt were also most difficult for them to promote (Pearson correlation coefficient = 0.75, p-value = 0.03). These included: higher maternal food intake, daily intake of eggs and dairy, and avoiding heavy workload during pregnancy. Qualitative analysis revealed that CHWs who considered dietary behaviors as 'most difficult' described feeling conflicted to counsel mothers from poor families to purchase expensive foods like eggs and dairy that were also not part of family meals, while 'avoiding heavy workload' was difficult to promote in households with absent male adults or with mothers-in-law who considered the behavior non-normative for rural women, regardless of their pregnancy status.
CONCLUSIONS
In this study, CHWs offered important insights on MN-focused behavior change, including that adoption and promotion of recommended MN behaviors may depend on the extent to which they are perceived as resource-intensive or non- normative.
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The authors have no conflict of interest.

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DEVELOPING THE BALKAN DIETARY PATTERNS MODEL

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BACKGROUND AND OBJECTIVES

Understanding dietary patterns is essential not only for addressing health-related non-communicable diseases (NCDs) but also for preserving cultural identity, fostering regional development, and supporting sustainable food systems. The Balkan region, characterized by rich cultural and religious diversity, exhibits both unique and shared dietary habits shaped by historical, social, and environmental factors. Using large, harmonized datasets from Bosnia & Herzegovina, Montenegro and Serbia, on food consumption collected between 2017–2022 through the EFSA EU Menu methodology, this study integrates comprehensive data with advanced modeling approaches to develop a multidimensional framework for analyzing regional dietary patterns in alignment with global healthy nutrition recommendations.

METHODS

Dietary data were gathered using 24-hour dietary recalls to capture actual food consumption and Food Propensity Questionnaires to assess usual intake. Both methods followed EFSA EU Menu standards, ensuring harmonization and comparability across Serbia, Montenegro, and Bosnia & Herzegovina. Investigator-defined methods (e.g., Healthy Eating Index), data-driven methods (e.g., principal component analysis), and hybrid modeling methods (e.g., reduced rank regression) were used to analyze the relationship between dietary behavior, cultural diversity, and socioeconomic factors.

RESULTS

Analysis of extensive datasets revealed shared dietary staples, such as grains, dairy, and vegetables, alongside regional variations in processed food consumption and dietary quality reflecting cultural and religious distinctions. Data-driven approaches effectively captured this diversity, while investigator-defined methods ensured alignment with health guidelines. Advanced tools, including machine learning, demonstrated potential for integrating multidimensional data and offering deeper insights into regional dietary patterns and their relations to health indicators.

CONCLUSIONS

By leveraging harmonized, large-scale datasets on food consumption, this study developed a robust multidimensional model that captures both similarities and differences in dietary patterns across the culturally diverse Balkan region. This model addresses health-related NCDs, supports sustainable food systems, and informs evidence-based public health policies. Situating these findings within global nutrition recommendations highlights the region’s potential to influence broader efforts in health promotion, cultural resilience, and sustainability.

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MODE OF DELIVERY AT BIRTH AND ITS ASSOCIATION WITH CARDIOMETABOLIC RISK FACTORS IN ADOLESCENCE

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BACKGROUND AND OBJECTIVES

In vaginal childbirth, the newborn is colonised by beneficial microorganisms from the maternal vaginal flora, such as Lactobacillus. In the caesarean section, the microbiota formed resembles the skin and the hospital environment, which can affect metabolic and cardiovascular regulation throughout life. Our aim was to verify the relationship between the type of birth and cardiometabolic factors in this individual in adolescence.

METHODS

A longitudinal study, with retrospective data from birth and prospective data from adolescence, approved by the Human Research Ethics Committee of the Federal University of Viçosa (6.104.415). A total of 831 adolescents (both sexes) were assessed on a 12-hour fast for weight, height, waist circumference, body mass index (BMI), waist-to-height ratio (WHtR), blood pressure, total cholesterol and fractions and uric acid. Information on the mode of childbirth of these adolescents was obtained from the records of the local maternity hospital. The Mann-Whitney test was applied to verify the relationship between the type of childbirth (vaginal and caesarean section) and cardiometabolic factors in adolescence, using SPSS software (20.0), with a significance level of 5%.

RESULTS

The median age was 16 years (10-19), 65% (n=540) were female, and 65.1% (n=544) were born by caesarean section. In girls, 22.8% (n=123) were overweight and 18.4% (n=99) had an WHtR greater than 0.5; in boys, 21.9% (n=64) and 22.6% (n=66), respectively. Boys born by caesarean section had higher medians (p=0.005) for BMI (20.32 x 18.36 kg/m²), waist circumference (72.00 x 66.50 cm), systolic blood pressure (103.00 x 97, 00 mmHg), total cholesterol (157.00 x 145.50 mg/dL), LDL cholesterol (92.00 x 87.50 mg/dL), and uric acid (3.80 x 3.20 mg/dL) in adolescence, when compared to those born by vaginal childbirth. In girls, those born by caesarean section had higher median waist circumference (p=0.005) (71.78 x 68.50 cm) and WHtR (0.45 x 0.43) in adolescence compared to those born by vaginal childbirth.

CONCLUSIONS

Birth by caesarean section was associated with higher values of these cardiometabolic factors in adolescence, indicating a greater risk of developing cardiovascular and metabolic diseases at this stage of life, which tend to persist or worsen in adulthood, especially in males. *Acknowledgements:* To the Minas Gerais State Research Foundation (FAPEMIG) for the funding (APQ 03016-23), the CAPES Foundation, and the Postgraduate Programme in Nutrition Science at the Federal University of Viçosa.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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UNRAVELING THE FOOD ENVIRONMENT AND SUGAR SWEETENED BEVERAGE CONSUMPTION AMONG EARLY ADOLESCENTS

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BACKGROUND AND OBJECTIVES
Consumption of sugar sweetened beverages (SSBs) is reported to be on the increase among adolescents giving rise to concern regarding the burden of weight gain and non-communicable diseases. Despite interventions to modify the food environment adolescents are exposed to, there is a gap in knowledge examining the relationship between the food environment and SSBs consumption. The study aimed to explore the home and school food environment adolescents are exposed to and identify factors associated with SSBs consumption.
METHODS
A cross-sectional study was conducted using 299 participants from 4 Junior High Schools. Data was collected on socio-demographics; anthropometry; knowledge, attitude, and practice toward SSBs consumption and the home and school food environment. Data was analyzed using the Statistical Package for Social Sciences (SPSS) software version 27. Logistic binary regression was performed to identify the factors associated with SSBs intake at alpha of less than 0.05 at 95% CI. Ethical clearance, parental consent, and child assent were obtained for the for study.
RESULTS
The mean age of the participants was 13 (± 2) years with more than half (57.2%) being girls. The prevalence of stunting and thinness was 5.4% and 4.7% respectively. More than half (57.2%) of the participants had good knowledge of SSBs, however, majority had poor attitude (57.2%) and practice (86.6%) towards SSBs consumption. The prevalence of SSBs consumption among the participants was 38.8%. The factors found to be associated with SSBs intake among the adolescents were having a social networking site [AOR = 2.22; 95% CI (1.28 – 3.85), p = 0.004], how often parents buy SSBs [AOR = 1.67; 95% CI (1.01 – 2.76), p = 0.047], accessibility to SSBs at home [AOR = 2.27; 95% CI (1.31 – 3.94), p = 0.003], Having a policy restricting SSBs at home [AOR = 1.77; 95% CI (1.04 – 3.02), p = 0.036] and parental consumption of SSBs at home [AOR = 0.42; 95% CI (0.22 – 0.83), p = 0.012].
CONCLUSIONS
The home food environment was associated with SSBs consumption among the adolescents but not the school food environment. This highlights the significant role parents have to play in creating a healthy food environment to improve healthy food consumption.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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DIETARY AND HEALTH ASPECTS AND PHYSICAL PERFORMANCE IN MEN WITH RECREATIONAL PHYSICAL ACTIVITY IN THE CONTEXT OF TAKING DIETARY SUPPLEMENTS: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
Many adult men undertake various types of training to improve physical performance and increase muscle mass [1]. More and more of these men take dietary supplements [2]. Aim: To analyse the association between diet, nutritional status, and the use of dietary supplements by men with recreational physical activity.
METHODS
The study involved 170 men with recreational physical activity, aged 19-40. Data were collected on men's lifestyle, type and amount of dietary supplements used. Diet quality was determined using two predefined diet quality scores: pro-healthy diet index (pHDI) and non-healthy diet index (nHDI) based on data collected with the food frequency questionnaire (KomPAN®). The energy and nutritional value of the diet was determined by 3-day food record. Body composition, maximum oxygen consumption (VO2max) in the spiroergometric exercise test with exhaust gas analysis, and heart rate were measured. The concentration of proteins, lipids, glucose, selected hormones, haematological and inflammation markers was determined in fasting venous blood.
RESULTS
69% of the sample used dietary supplements, most often containing milk proteins. Men who used dietary supplements compared to those who did not use them, consumed more protein and/or amino acids from dietary supplements (by 32%; $p<0.0001$), and had a significantly higher dietary intake of docosahexaenoic acid (by 45%); vitamins: B12 (by 33%), B2 (by 28%) and D (by 25%), cholesterol (by 21%), protein (by 20%), folates (by 19%), phosphorus (by 19%), magnesium (by 8%) and zinc (by 7%) and a better diet quality determined by the pHDI (by 47%; $p<0.001$). Men using dietary supplements compared to those who did not use them, had a significantly more favorable body composition: lower body fat content (by 15%), higher lean body mass content (by 3%) and a better result of the maximum exercise test (by 7%). There were no differences between both groups of men in the occurrence of disorders health in relation to 30 out of 33 analysed blood markers.
CONCLUSIONS
The use of dietary supplements by men with recreational physical activity had a weak association with health markers. The observed benefits in body composition and physical performance are rather due to the combined effect of the use of dietary supplements and better quality of the diet.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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ASSOCIATION BETWEEN SERUM EICOSAPENTAENOIC ACID/ARACHIDONIC ACID RATIO AND HYPERTRIGLYCERIDEMIA BY SMOKING STATUS: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES

A high eicosapentaenoic acid (EPA)/arachidonic acid (AA) ratio is considered a protective factor against hypertriglyceridemia (HTG), whereas smoking is a strong risk factor. The association among smoking history, serum EPA/AA ratio, and HTG levels remains unclear in the general Japanese population. This study aimed to clarify the association between the serum EPA/AA ratio and HTG prevalence in the general Japanese population based on smoking history.

METHODS

A total of 3600 community-dwelling individuals aged ≥ 40 years were enrolled from 2009–2011. We selected 1305 participants aged 40–74 years with no past myocardial infarction or stroke and measured their levels of serum polyunsaturated fatty acids, including EPA and AA. The level of the serum EPA/AA ratio was categorized into quartiles (<0.27, 0.27–0.38, 0.39–0.53, and >0.53). HTG was defined as > 150 mg/dL (1.69 mmol/L) or > 175 mg/dL (1.98 mmol/L) for fasting and non-fasting triglycerides, respectively. Adjusted odds ratios (AORs) and 95% confidence intervals (CIs) were analyzed using logistic regression analysis to evaluate the relationship between the serum EPA/AA ratio and HTG levels in the subgroups stratified according to smoking history (current smoker or non-smoker).

RESULTS

The prevalence of HTG in nonsmokers and smokers in the first (low), second, third, and fourth (high) quartiles of the serum EPA/AA ratio was 20.4% and 26.3%, 21.8% and 22.8%, 19.1% and 25.0%, and 14.2% and 30.6%, respectively. In the multivariate analysis (adjusted for age, sex, body mass index, social status, lifestyle, and medical history, such as hypertension, diabetes mellitus, hyperlipidemia, heart disease, and stroke), non-smokers in the highest quartile of the serum EPA/AA ratio had a significantly lower AOR for HTG than those in the lowest quartile (AOR; 0.54, 95% CI; 0.33, 0.86, P = 0.046), but was not significantly different among smokers (AOR; 0.62, 95% CI; 0.16, 2.34, P = 0.661).

CONCLUSIONS

These findings provide evidence of a significant inverse association between the serum EPA/AA ratio and HTG among nonsmokers; however, no such association was observed in smokers. Smoking may reduce the beneficial effects of EPA, suggesting the importance of smoking cessation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EFFECTS THROUGH THE APPROACH OF RECOMMENDING A PLANETARY HEALTH DIET TO IMPROVE DIET ON NUTRITIONAL KNOWLEDGE AND DIETARY BEHAVIOUR CHANGE: AN INTERVENTION STUDY IN JAPANESE MALE UNDERGRADUATES

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BACKGROUND AND OBJECTIVES

Few young Japanese adults regularly eat breakfast and a well-balanced diet composed of staples, course dishes, and sides, which is associated with poor awareness of healthy diets.

A planetary health diet was recently recommended to achieve Sustainable Development Goals (SDG), with higher SDG awareness among young males. We hypothesised that approaches recommending healthy planetary diets may help promote healthy diets among young Japanese individuals. This study examined the effects of recommending a planetary health diet on nutritional knowledge and dietary behaviour changes in male Japanese university students by comparing pre-intervention and post-intervention RESULTS.

METHODS

The target group comprised 1624 engineering students aged 18–24 years (86.0% male) at a public university in Hyogo Prefecture, Japan. The study contents were announced through the university portal site and flyers/posters. They were recommended a planetary health diet through a 1-year poster display and monthly updates of information videos on a university portal site. For the pre-intervention and post-intervention comparisons, data from 63 young males who responded to both the pre-intervention survey in 2022 (total number of respondents, n = 222) and the post-intervention survey in 2023 (n = 78) were used. The Wilcoxon signed-rank test was used to compare scores (15 to 60) of nutritional knowledge (Cronbach's α, 0.931), as well as stage of dietary behaviour change (practices such as reducing food loss, choosing foods with low food print, and eating a more plant-based diet), regular breakfast consumption, and intake of a well-balanced diet at least twice daily, between pre-intervention and post-intervention.

RESULTS

The median nutrition knowledge score at post-intervention (41.0 points) was significantly higher than that at pre-intervention (38.0 points) (P = 0.022). After the intervention, the stages of dietary behaviour change increased; the percentages of students in the pre-intervention and post-intervention stages were 12.7% and 19.0% in the contemplative stage and 12.7% and 17.5% in the maintenance stage, respectively, showing a trend towards improvement (P = 0.054).

CONCLUSIONS

Among male university students, the approach of recommending a planetary health diet affects nutritional knowledge and the dietary behaviour change stage.

CONFLICTS OF INTERESTS

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BREAKFAST CONSUMPTION EFFECTS ON MENTAL STATUS AND INTELLECTUAL PERFORMANCE AMONG FEMALE UNIVERSITY STUDENTS IN JAPAN

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BACKGROUND AND OBJECTIVES
Skipping breakfast for young adults, including university students, has been a problem in Japan for many years. Although cross-sectional studies have reported that skipping breakfast is associated with mental health problems and poor academic performance, few intervention studies have examined the effects of eating breakfast among university students in Japan. This study investigated the effects of breakfast intake on university students' mental status and intellectual performance.
METHODS
A randomized crossover study was conducted in 2022 and 2023 among 48 female students from the first through fourth grades in a Hyogo Prefecture, Japan university department. The students participated in the study for non-continuous two days; students ate breakfast for one day (445 kcal, 13.1 protein E%, 24.0 fat E%, and 62.9 carbohydrate E%) and skipped breakfast the other day. Mental arithmetic test and an assessment of mental status using a visual analog scale were conducted. The visual analog scale assessed concentration, sleepiness, vitality, and tiredness. These tests and assessments were conducted at four time points: the time of visit (Time 1), immediately after eating or skipping breakfast (Time 2), and at 60 (Time 3) and 120 min (Time 4) after Time 2.
RESULTS
In mental arithmetic test, compared with Time 1, the number of correct answers increased significantly at Time 2, 3, and 4 on both breakfast and skipped breakfast days. The concentration and vitality scores at Times 2, 3, and 4 on breakfast days were significantly higher than those on skipped breakfast days. The tiredness score at Times 2, 3, and 4 and the sleepiness score at Time 2 on breakfast days were significantly lower than that on skipped breakfast day.
CONCLUSIONS
It was suggested that breakfast consumption positively affected concentration, vitality, and tiredness among female university students.
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HIGH ADHERENCE TO THE JAPANESE FOOD GUIDE SPINNING TOP MAY BE ASSOCIATED WITH LOWER 24-HOUR URINARY SODIUM EXCRETION AND SODIUM-TO-POTASSIUM RATIO, AND HIGHER POTASSIUM EXCRETION

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BACKGROUND AND OBJECTIVES
The Japanese Food Guide Spinning Top (JFGST) does not assess dietary salt; nevertheless, salt reduction remains an important issue in population-level studies of diet. This study aimed to investigate the association between adherence to the JFGST calculated by weighed food records (WFRs) or a Food Frequency Questionnaire (FFQ), and urinary sodium and potassium excretion and sodium-to-potassium ratio. Further, salt-added scores were developed and analyzed.
METHODS
We used cross-sectional data, including data from 12-day WFRs, five 24-hour urine collections, and an FFQ. Participants were 248 Japanese aged 35–80 years who participated in the JPHC-NEXT validation study between 2012 and 2013. Main outcomes were 24-hour urinary sodium and potassium excretion and sodium-to-potassium excretion ratio. Multiple regression analysis was performed with urinary excretion as the dependent variable and JFGST score calculated by WFRs and the FFQ as independent variables. Because scores are not proportional to intake under this JFGST scoring method, Spearman's correlation coefficients were calculated between the score and urinary excretion, and between the number of servings and urinary excretion.
RESULTS
When scored by WFRs, the higher JFGST score group tended to have lower sodium excretion (-129 mg/day per one quartile increase; P for trend, 0.051), higher potassium excretion (137 mg/day per one quartile increase, P <0.01), and lower sodium-to-potassium ratio (-0.32 per one quartile increase, P <0.01). When accompanied by salt-added scores, total score was associated with further reductions in sodium excretion (-218 mg/day per one quartile increase; P for trend, <0.001).
CONCLUSIONS
Even though the JFGST does not assess dietary salt, high JFGST adherence tends to be associated with lower sodium excretion and sodium-to-potassium ratio and higher potassium excretion. This inverse association with sodium excretion was strengthened by the addition of a salt-added score.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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A 12-WEEK PILOT RANDOMIZED CONTROLLED TRIAL OF AN ORAL NUTRITIONAL SUPPLEMENT IN IMPROVING THE NUTRITIONAL AND HEALTH OUTCOMES OF THE ELDERLY IN PERI URBAN COMMUNITIES

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BACKGROUND AND OBJECTIVES
There has been a rapid global increase in the population of the elderly, with this demographic projected to more than double from 1.1 billion in 2021 to nearly 2.1 billion by 2050. Biological and physiological changes, as well as psychological and socioeconomic factors associated with ageing increase vulnerability to undernutrition and poor health. Oral Nutritional Supplements (ONS) have been explored among other interventions to improve the nutrition and health of the elderly with mixed RESULTS. This pilot study is investigating the efficacy of a locally made plant-based ONS in improving the nutritional and health outcomes of the elderly in peri urban communities in Accra, Ghana.
METHODS
A census of the elderly was undertaken in five peri urban communities and a cross-sectional of 200 elderly individuals aged 60 years and above dwelling in these communities will be interviewed to assess the relationship between usual dietary intake and health status. Eighty of the participants will be randomly selected for a 12-week randomized control trial (RCT). The intervention group will receive a 7-day supply of a plant based ONS, which they will consume daily, and the control group will receive nutrition education that will be given to all participants. Data to be collected on all 200 participants at baseline (0 wk.), midline (6 wks.) and endline (12 wks.) include sociodemographic characteristics, usual dietary intake, body weight, physical activity, hand grip strength, systolic and diastolic blood pressure. For the RCT participants, biochemical indicators (serum albumin, ferritin, hemoglobin, cholesterol and C reactive protein) will be collected at 0 wk. and 12 wks. Adherence and morbidity associated with the use of ONS will be collected weekly. Logistic regression will be used to identify the relationship between dietary intake and health outcomes. Repeated measures ANOVA and paired-sample t-test will be used to analyze outcome measures within the intervention and control groups. The multivariate ANOVA and the independent sample t-test will be used to analyze outcome measures between groups.
RESULTS
The study will identify the association between usual dietary intake and health outcomes of the elderly and the effect of daily consumption of a plant based ONS on the nutritional and health outcomes of the elderly.
CONCLUSIONS
The findings would provide insights for a larger randomized controlled trial that could establish the efficacy of a locally produced ONS for the feeding of the elderly.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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PERCEPTIONS ABOUT CHILDREN´S ENVIRONMENT THAT COULD CONTRIBUTE TO THE INCREASE OF OBESITY IN YOUTH

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BACKGROUND AND OBJECTIVES
Worldwide, the prevalence of obesity in children is high and the environments can promote high-fat diets and sedentary lifestyles. Objective: To analyze the perceptions about environments related to nutrition and physical activity of schoolchildren
METHODS
Descriptive qualitative study. Participated 19 caregivers and 7 school´s teachers selected at convenience schools from a rural and urban area of Ecuador. Participants signed an informed consent and a Bioethics Committee approved the protocol.
RESULTS
Caregivers and teachers perceived that children eat fruits and vegetables at home and school. However, children eat frequently unhealthy food like fast food and ultraprocessed products because they are popular among children. Parents and teachers say that children play and do physical activity in home and in the schools in a satisfactory manner (playing in the neighborhood or parks with friends and siblings, walking at home). Caregivers perceived that their work limit the time they share with the children as eating or doing physical activity, which could have an impact on the health of the children
CONCLUSIONS
Parents and teachers are concerned that children frequently consume unhealthy food despite having access to fruits and vegetables. They indicate that children do physical activity but parents do not have time to share with their children and they are exposed to the influence of the environment and peers.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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DIETARY INTERVENTION FOR HEIGHT GROWTH PROMOTION IN PRESCHOOL CHILDREN: ASSOCIATION WITH INFORMATION SOURCES AND PARENTAL FACTORS

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BACKGROUND AND OBJECTIVES
This study investigated the types of dietary intervention used by parents to promote the height growth of preschool children and their associations with parental information sources and anthropometric characteristics.
METHODS
In January 2024, a web survey was conducted with 1,400 mothers of children of 3–5 years of age. The analysis included 1,362 participants after excluding those with invalid responses and underlying conditions. The survey items included parent and child physiques, dietary habits, and sources of information on the child's physique. The child's physique was obtained at birth, during infant health check-ups, and at the most recent values. Children with a height ≤-2 standard deviations at any point were classified as having short stature (SS). The participants were classified into the intervention group (n=531) if they implemented dietary measures for height growth promotion, while the remaining participants formed the control group (n=831). The association between nominal variables was evaluated using Fisher's exact test and factors related to dietary interventions were examined using a multiple logistic regression analysis.
RESULTS
One hundred thirty-five (25.4%) participants in the intervention group and 149 (17.9%) in the control group were defined as having SS (P=0.001). The food most frequently consumed for promoting height growth was milk and dairy products (420 [79.1%]). Compared to the control group, the intervention group showed higher rates of appropriate consumption frequency for milk/dairy products and fish. A multivariate analysis showed that dietary intervention was positively associated with SS, food allergies, seeking information about child growth patterns, obtaining information from the family or friends, and a shorter parental height.
CONCLUSIONS
Parental decisions regarding dietary intervention were associated with the child's height status, food allergy, information about physical characteristics, and parental height.
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CONFLICTS OF INTERESTS
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EPO5_352

NUTRITIONAL VULNERABILITY OF INTERNALLY DISPLACED PERSONS (IDPS): A STUDY OF FOOD ACCESS AND NUTRITIONAL STATUS OF IDPS

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BACKGROUND AND OBJECTIVES
Concerns about global food insecurity have been on the rise in recent years and more prevalent in low- and middle-income countries [1,2]. This study aimed to assess the determinants of food security among the internally displaced persons (IDPs) living and their children under five and the influence on their nutritional status.
METHODS
This descriptive cross-sectional, community-based study using random sampling of adult internally displaced persons (IDPs) caregivers and children under five in households were included. The caregivers were interviewed using a validated structured questionnaire and nutritional assessment of both the children and adult population was conducted. Data was analysed using Statistical package for the Social Sciences version 27. Ethical clearance was obtained from an institutional review board.
RESULTS
The study findings revealed a high proportion of food insecurity among IDP households, with a staggering 97.6% experiencing some degree of food insecurity. In addition, 28.3% of the surveyed households had good dietary diversity. Also, 50.61% were stunted, over a third were underweight, and 15.8% were wasting, reflecting severe nutritional deficiencies prevalent among IDP children. Besides, 28.4% of the adults were overweight or obese, while a substantial number were underweight. Multiple linear regression estimates revealed that the monthly salary of caregivers and monthly average money spent on food, were associated with decrease in food insecurity. While increase family size and used of coping strategies were associated with increase food insecurity.
CONCLUSIONS
There is a high proportion of food insecurity among IDPs forcing households to adopt various coping strategies, primarily through dietary modifications. Consequently, low dietary diversity and poor nutritional status with underweight, wasting, and stunting among children. These findings emphasize the urgent need for comprehensive interventions to address the root causes of food insecurity, improve access to nutritious food, and ensure the health and well-being of IDPs
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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ANIMAL SOURCE ENERGY CONSUMPTION – ASSOCIATIONS WITH NUTRIENT INTAKE AND BLOOD BIOMARKERS AMONG FINNISH PRESCHOOLERS

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BACKGROUND AND OBJECTIVES
Definitions of vegetarian or plant-based diets vary. In a group of preschool-aged children, we describe consumption of animal source foods quantitatively using a continuous variable. We then aim to analyse how animal source food intake is associated with nutrient intakes and blood biomarker concentrations.
METHODS
Data for this cross-sectional study was collected in 2017. Children aged 1–7-years (n=51) following a vegan (n=7), vegetarian (n=11), or omnivorous diet (n=33) were recruited from municipal daycare centres. Four-day food records, background information, and fasting blood samples (n=40) were collected. Animal source energy as a percentage of total energy intake (ASEP, E%) was calculated from food records. Plasma LDL cholesterol and erythrocyte folate concentrations, and serum untargeted MS-metabolomics were analysed from blood samples.
RESULTS
ASEP ranged from 0E% to 52E%. There was an overlap in ASEPs of vegetarian (median 8E%, range 0E%–20E%) and omnivore groups (median 33E%, range 11E%–52E%). We observed a positive correlation between ASEP and saturated fat (SAFA, E%; r=0.785) and cholesterol (r=0.715) intake, and a negative correlation of ASEP with polyunsaturated fat (PUFA, E%; r=−0.819) and fibre (r=−0.828) intake. In addition, ASEP correlated positively with LDL-cholesterol concentration (r=0.699).
CONCLUSIONS
There was considerable variation in ASEPs of non-vegan participants. Higher intake of animal source foods was linked to a less favorable fatty acid intake profile and lower fiber intake, as well as with higher plasma LDL cholesterol concentrations.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SURVEY OF THE DIETITIAN'S SUPPORT DURING THE TRANSITION OF PATIENTS WITH FOOD ALLERGY

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BACKGROUND AND OBJECTIVES
Patients with childhood-onset food allergy (FA) may not acquire tolerance in adulthood or may have difficulty introducing foods once eliminated. Dietitians play an important role in the dietary management of patients with FA. However, an optimal support during the transition period is unclear. This study aimed to clarify the challenges faced by transitioning patients with FA and the support that dietitians can provide.
METHODS
A self-administered questionnaire survey was conducted among patients with FA aged 16-25 years between October 2023 and August 2024.
RESULTS
The median (range) age of the participants during the survey was 20 (16-24) years, and the number of eliminated foods was four (1-11) and two (0-6) in the past and present, respectively. Twenty-seven patients (71%) had a history of anaphylaxis. When patients with FA had problems with their FA, 30 (81%) consulted family members, 23 (62%) physicians, two (5%) dietitians, and 15 (41%) non-healthcare professionals. Nineteen patients (51%) had no experience with dietary counseling by hospital dietitians. Twenty-nine, 18, and 11 patients were allergic to hen's egg, milk, and wheat, respectively. Those who were not interested in introducing allergens included 15 patients (52%) for hen's egg, 10 (56%) for milk, and 1 (10%) for wheat. Nineteen patients (66%) found the taste of hen's egg unacceptable, 13 (72%) of milk and one (10%) of wheat. Conversely, the most positive aspects of being cured of FA were "expanded food choices", "increased opportunities to eat out", and "expanded friendships". Patients with FA desired support such as "interaction with other patients", "instructions for allergen intake" and "school life".
CONCLUSIONS
Dietitians should support transitioning patients with FA regarding food elimination, allergen introduction, and interaction with other patients with FA.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EFFECT OF PERCEIVED HEALTH STATUS AND PERCEIVED BODY IMAGE ON DIETARY BEHAVIOR AMONG UNIVERSITY STUDENTS IN NORTHERN TAIWAN

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BACKGROUND AND OBJECTIVES
An improper diet is one of the critical factors causing health problems in modern people. High-sugar, high-salt, high-fat, and low-fiber diets are prevalent, particularly in urban areas. Perceived health status (PHS) and perceived body image (PBI), which are personal evaluations of one's health and body shape, respectively, may be affected by subjective thinking, the living environment, and social values. Therefore, the objective of this study was to evaluate the influence of PHS and PBI on dietary behavior among university students based on their subjective feelings of themselves.
METHODS
University students in northern Taiwan were recruited through random sampling, and 415 valid questionnaires were collected. Closed questionnaire items included sociodemographic characteristics, PHS, PBI, and eight dietary behaviors (overeating, restricted eating, low-fat foods, high-fiber foods, salty eating, eating sweets, dietary supplements, and smoked/pickled/fermented foods). Independent sample *t*-test, one-way ANOVA, and multiple linear regression analysis were conducted for statistical analysis.
RESULTS
Dietary behaviors showed significant differences according to institutional orientation, sex, and body mass index (BMI). Specifically, students attending vocational colleges were more likely to adopt salty and sweet eating and to consume dietary supplements and smoked/pickled/fermented foods compared to students attending general universities. Male students were more inclined to consume salty foods, dietary supplements, and smoked/pickled/fermented foods, whereas female students were more inclined to eat low-fat foods. Regarding BMI, students who were underweight (BMI<18.5) were more likely to eat foods that were too sweet compared with those who were of normal weight or overweight. After adjusting for sociodemographic variables that may affect dietary behavior, PHS and PBI were found to have consistently influenced dietary behavior. Students with higher PHS scores were more likely to adopt restricted eating and to consume low-fat and high-fiber foods, dietary supplements, and smoked/pickled/fermented foods. Students with higher PBI scores were more likely to overeat and to eat high-fiber and smoked/pickled/fermented foods.
CONCLUSIONS
In summary, PHS and PBI may be used to screen students who require improvement in their dietary behaviors. The study findings may provide a reference for health education for the government and universities.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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ULTRA-PROCESSED FOODS IN THE DIETARY PATTERNS OF ADULT POPULATION FROM SOUTH AMERICA

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BACKGROUND AND OBJECTIVES
There is an association between consumption of ultra-processed foods and beverages and development of chronic non-communicable diseases, ultra-processed food should be part of populations dietary patterns. Objective: To identify dietary patterns (DPs) in the adult population from a region in a country in south America, according to the NOVA food classification system, to know the share of processed (PF) and ultra-processed foods (UF) in the diet, and their association with socioeconomic determinants
METHODS
cross-sectional study with a random sample of 1394 adults aged 18 to 59 years, derived from a populational study conducted in 2019. Dietary intake assessment was carried out with 24-hour recalls, food consumption was quantified in grams and grouped according to the NOVA classification. The DPs were established by Factorial Analysis by principal components with varimax orthogonal rotation. To verify the association between DP and socioeconomic variables, Poisson logistic regression with robust variance was used.
RESULTS
Five DPs were defined that represent 28.5% of the variance of the population's diet. DP 1) Cereals/Eggs/Sugar, 2) Oils/Sausages/Drinks/Tubers, 3) Industrialized Cereals/Snacks/Sauces/Preparations, 4) Meats/legumes/Breads, and 5) Fruits/Vegetables/Water/Cheese.
CONCLUSIONS
PF and UF are present in four of the retained DPs and show greater adherence by younger people and those with medium and high economic income. The two DPs with the greatest amount of "*in natura*" foods, one represents a basic diet of subsistence, with greater adherence by people with low income and the other, a diet with better nutritional quality foods, followed by older people and with high income. This study is novel insofar as it classifies food consumption, obtained through R24h, with the NOVA food classification system and allows evidence PF and UF share in the population's diet.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_358

NUTRITIONAL STATUS OF CHILDREN WITH DISABILITIES IN THE KHOMAS REGION, NAMIBIA

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BACKGROUND AND OBJECTIVES
Children with disabilities are especially susceptible to malnutrition, particularly in developing countries, as they are often neglected, their needs disregarded and they frequently experience nutrition-related difficulties. This study investigated malnutrition among children, 6 months to 18 years, with disabilities living in the Khomas region, Namibia.

METHODS
A descriptive, cross-sectional study was conducted to collect sociodemographic and dietary intake data through structured interviews among children recruited, with the consent of their parents/primary caregiver and their own accent, from the schools and care centers for children with disabilities in the Khomas region of Namibia. Anthropometric measurements were taken following standardised procedures. Growth indicators were categorised using the World Health Organisation (WHO) AnthroPlus Software. Data were analysed using Statistical Analyses Software.

RESULTS
The study included 94 children aged six months to 17.5 years (IQR: 3.4-10.9) with various disabilities, including autism spectrum disorder, deafness, developmental delay, emotional disturbances, intellectual disabilities, orthopedic impairments, learning impairments, speech and language impairments, cerebral palsy and visual impairments. Stunting was evident in 42.6% of children (of whom 19.2% were severely stunted), wasting in 33% (18.1% severely wasted), and underweight in 52.2% (18.1% severely underweight). Overall, 32.4% of the children had low MUAC, meeting the diagnostic criteria for severe acute malnutrition, and 41.2% had moderate acute malnutrition. Malnutrition, as indicated by anthropometric markers, was significantly ($p<0.05$) associated with autism, developmental delay, intellectual disability and cerebral palsy. These markers were also significantly associated with sociodemographic characteristics of caregivers, including low education level and low income, lack of household amenities, including sanitation and safe water sources, the amount of money spent on food, access to medical care and multimedia, and household food insecurity.
CONCLUSIONS
In this population, malnutrition was highly prevalent in children with disabilities and was significantly associated with markers of poverty. Strategies to improve nutritional status through improved dietary intake are paramount to support growth and development in this vulnerable population.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_359

WHEN EAST MEETS WEST: UNDERSTANDING HEALTHY EATING PERCEPTIONS AMONG ASIAN ETHNIC GROUPS IN HIGH-INCOME WESTERN COUNTRIES

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BACKGROUND AND OBJECTIVES
Asian ethnic groups in high-income Western countries (WHICs) have unique perspectives on healthy eating shaped by traditional and Western eating practice. However, their ability to procure and consume what they consider to be healthy may be compromised due to barriers like limited availability or affordability of culturally appropriate options. This qualitative evidence synthesis (QES) aims to comprehensively summarize 1) what eating patterns are perceived as healthy by these populations and 2) how their cultural beliefs add to these perceptions. Such insights can help improve their food environments and promote healthier, culturally relevant food choices that are distinct to Asian ethnic groups.
METHODS
Exhaustive literature search was performed across six databases (Pubmed, CINAHL, EMBASE, Web of Science, Scopus, PsycINFO). Included studies generated primary qualitative data on healthy eating perception of Asian ethnic groups in WHICs. Data were extracted using an adapted JBI Qualitative Data Extraction form, and JBI Checklist for Qualitative Research was used for quality appraisal. Data synthesis followed the meta-aggregation approach, with cumulative confidence established following the ConQual approach.
RESULTS
From 8118 screened records, 26 papers were included, covering data from nine Asian ethnic groups in seven WHICs. Preliminary findings identified common dietary patterns recognized across ethnic groups as healthy (e.g., high intake of vegetables, fruits, and fish) or unhealthy (e.g., excessive fat, sugar, or calories consumption). “Freshness” and “balance” were key elements of a healthy diet. Traditional diets were viewed as healthier than Western options for some groups (e.g., Chinese, Hmong) but not for others (e.g., Pakistani). All groups integrated their cultural beliefs (e.g., hot/cold energy for Chinese group) with Western concepts (e.g., modern terminologies like calories). They gained their food-related knowledge from social networks, health experts, and mass media. Generational differences emerged, as older and 1st-generation individuals favored traditional beliefs, yet younger and US-born individuals followed Western ideas. Healthy eating was not always prioritized in their practice, as social and cultural significance of food sometimes outweighed health impacts.
CONCLUSIONS
This QES is the first to summarize the healthy eating perceptions across Asian ethnic groups in WHICs and reveal the complexity and nuances of their dietary knowledge. Findings can be integrated in culturally tailored interventions to improve food environments in Asian communities in WHICs, ultimately enhancing their nutritional and overall wellbeing.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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COMPARISON OF BODY COMPOSITION AND NUTRITION BETWEEN ORAL CONTRACEPTIVE USERS AND NON-USERS

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BACKGROUND AND OBJECTIVES
One of the side effects of oral contraceptive (OC) use has previously been shown to be weight gain, but the current literature is insufficient to draw firm CONCLUSIONS, and objective, precise assessments of body composition have not been thoroughly investigated. Aim: to clarify the body composition parameters (incl fat percentage (%), fat and fat-free mass) body mass index (BMI) and the availability of energy and nutrients from food of OC users (OCU; high- [OCUH] and low-dose [OCUL]) hormone users) and non-consumers (OCN).
METHODS
A total of 45 women with mean age 21.8 ±1.7 years were enrolled. 19 (42.2%) of them were OCN and from OCU 38.8% were OCUL. Three-day dietary recall + Nutridata-program, and dual-energy x-ray absorptiometry were used. For statistical analysis, a chi-squared test, Student's t-test, and Spearman`s correlation was performed.
RESULTS
The mean body height and mass, BMI, fat mass, fat% and fat-free mass was 168.3 ± 5.6 m, 62.5 ± 8.5 kg, 22.5 ±4 kg/m2, 21.7 ± 5.0 kg, 34.5 ± 4.6 kg and 38.6 ± 5.1 kg, respectively. Additionally, there was no difference between any group. Seven subjects were overweight based on BMI and 28 subjects on fat% (including 3 and 16 subjects in OCU, respectively). On average, subjects received 1558.5 ± 515.5 kcal energy from food; 60% received <80% of recommended daily amount; carbohydrates accounted for 43.8%, fats for 38.2% and proteins for 17.4% of dietary energy, with fats accounting for a larger proportion of energy in OCU than in OCN (40.9% *vs* 34.1%, p = 0.002). Unexpectedly, there was no correlation between dietary energy and BMI; (r = -0.29; p = 0.057); and fat% (r = 0.1; p = 0.511). The diet was deficient in micronutrients, particularly iron and folate, as well as vitamins D, A, and E. Among OCN compared to OCU, a greater percentage of women received less than 80% of the recommended intake of vitamin B12 (68% vs. 46.2%; p = 0.01). Vitamin C deficiency was higher among OCU than OCN (76.9% vs. 52.6%; p = 0.002), while OCN received less vitamin C than both groups of OCU recipients (88.9% vs. 50%; p = 0.05). In OCU group, the average time of using OC 4.3 ±2 years.
CONCLUSIONS
Oral contraceptive intake is not associated with diet or body composition; however, significant differences in micronutrient levels were observed between the groups.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_361

PARENTAL OPINIONS AND BELIEFS ON ORGANIC SCHOOL MEALS

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BACKGROUND AND OBJECTIVES
There is a growing interest in healthy lifestyles and organic foods, prompting the Estonian government to increase the proportion of organic food in school meals. However, understanding the perspectives of parents whose children are offered organic food in educational institutions is essential, as organic food generally incurs a higher cost. Parents may need to pay extra for school lunches, which could directly impact household expenses. The study aimed to clarify parents' views on organic school meals, assess their willingness to pay extra, and compare opinions between those who prefer organic food (OFP) and those neutral on the subject (OFN).
METHODS
This prospective cross-sectional study was conducted via an electronic questionnaire in the LimeSurvey environment (www.limesurvey.com) in May 2024. Approval was obtained from the Medical Ethics Committee of the University of Tartu, Estonia (protocol no 388-T8). Continuous data and proportions were compared using t-tests or Mann–Whitney tests, and categorical data using Chi-square or Fisher's exact test.
RESULTS
A total of 98 subjects (32 OFP and 66 OFN) provided open-ended responses about organic food. The average participant age was 43.8 ± 8.4 years (no difference between groups), with 77.8% employed and 13.3% studying. Women constituted 87.8% of respondents. Family sizes ranged from 2 to 7 members, with 60% reporting a monthly household income between 1000–4000 euros. Background characteristics did not differ significantly between groups. Parental opinions fell into 14 categories. Most respondents (28.6%) expressed dissatisfaction with the school food provided, with both groups sharing similar concerns (25% OFP and 30,3% OFN). Dissatisfaction was largely due to children's dislike of the food and caterers. The main difference between the groups was their opinion on the importance of organic food: 29.9% of OFP and 40.9% of OFN parents considered that organic labelling was not important (p=0.027). Both groups equally thought that school food should be varied, nutritious, tasty and sufficient. Only 3.1% of respondents believed school meals should be free, while 9.2% were willing to pay more, and 5.1% were opposed. Most other responses reflected general dissatisfaction with school meals.
CONCLUSIONS
For most parents, the priority was that school meals be nutritious and of high quality, with less importance placed on whether the food was organic. Only a minority expressed willingness to pay extra for organic meals.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_362

ASSOCIATION BETWEEN DIETARY DIVERSITY DURING PREGNANCY AND POSTPARTUM DEPRESSION

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BACKGROUND AND OBJECTIVES
Postpartum depression is an important mental health issue during women's life stages, and its causes include past history of depression and economic status. When evaluating the relationship with diet, it is important to consider not only single nutrients and foods but also the entire diet, including the combination and quantity of foods. In this study, we aimed to clarify the relationship between postpartum depression and the diversity of food intake during pregnancy, focusing on the number of foods consumed per day.
METHODS
Response data (n=1,041) from a semi-quantitative food frequency questionnaire (sFFQ) administered to women in the second trimester of pregnancy were used. sFFQ contains 165 foods and 9 frequency categories and consists of items asking whether the woman habitually consumed the listed foods within the past 2 months. The diversity assessment of food intake was based on the number of foods consumed per day from the foods listed in the sFFQ. (For example, if the respondent answered “once or twice a week,” the number was calculated as 1.5/7 times.) Postpartum depression was determined one month after delivery using the Edinburgh Postpartum Depression Self-Assessment (EPDS), with cutoff values of 8/9 and 12/13 to examine the relationship with the diversity of food intake.
RESULTS
Of the 1,041 subjects, 200 had an EPDS ≥9, and 70 had an EPDS ≥13. Logistic regression analysis was performed with the two EPDS cutoffs as the dependent variable and the quintiles of daily food intake as independent variables. Covariates were age, childbearing history, pre-pregnancy BMI, presence of stress in the past year, marital status, annual household income, and the subject's last level of education. Analysis revealed no significant differences in odds ratios. In a subsequent analysis, the same logistic regression analysis was performed separately for childbearing history, annual household income, and stress in the past year for the subjects, and no significant differences in odds ratios were found.
CONCLUSIONS
In this study, subjects were classified into quintiles based on the number of foods consumed per day, and a difference of more than 10 foods was confirmed between the highest and lowest groups. However, no significant association was found between the diversity of food intake and the onset of postpartum depression. It is suggested that further research on the relationship between the diversity of food intake and postpartum depression should be conducted in other pregnancy periods and with a larger number of subjects.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_363

LOCAL PERCEPTIONS OF HOW BALANCED-ENERGY PROTEIN SUPPLEMENTATION COULD BE TARGETED IN RURAL BANGLADESH

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BACKGROUND AND OBJECTIVES

Antenatal fortified Balanced Energy Protein (BEP) supplements are an approach that can address maternal undernutrition and inadequate gestational weight gain as causes of low birth weight (birth weight <2500 grams). BEP, however, has high relative costs, raising the question of whether targeting could improve its impact and cost benefit. An ongoing cluster-randomized controlled trial in northern Bangladesh is examining the impact on birth outcomes of targeting BEP based on maternal low body mass index (<18.5 kg/m2) and inadequate gestational weight gain compared to a control or untargeted supplementation. A qualitative study was conducted among women who completed participation in the trial to understand perspectives on targeted supplementation.

METHODS

In-depth interviews were conducted with 32 women following birth of their child. Qualitative data were analyzed thematically, using an implementation research framework from Proctor et al (2011). Participants were asked to rank, using 10 pictorial cards, the types of women in their communities who could most benefit from BEP; they were also asked to explain their opinions. Card ranking data were analyzed for top-3 and bottom-3 ranked categories and the individual and average Spearman's rank correlation coefficients were calculated.

RESULTS

Women struggled to grasp the concept of targeting, identifying BEP as needed by "every pregnant woman." When encouraged to identify women who could benefit most from BEP, the top 3 criteria included those consuming "rice-only diets" (in 32% of women's top-3), being an adolescent mother, and coming from a poor family (both 27%). The three least important criteria were nutritional indicators, viz. women with overweight (in 50% of women's bottom-3), short women (38%), and underweight women (15%). The average Spearman's rank was 0.28, indicating diversity in women's opinions. In justifying their rankings, women described a lack of "connection between [body] fat and food," defining nutrition as when a "body is healthy;" size was seen as an individual characteristic determined by God. Conversely, women described how inadequate diets could reduce a woman's strength, identifying women with poor, monotonous diets as particularly in need of the nutrients they knew were included in BEP.

CONCLUSIONS

While nutritional status indicators are frequently considered to target individuals in nutrition programs, findings from this study in rural Bangladesh suggest that strategies focusing on poverty and poor diets could prove more salient for the beneficiaries of such programs.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_364

STUDY ON THE IODINE NUTRITIONAL STATUS OF NON-PREGNANT WOMEN IN DIFFERENT WATER IODIZATION AREAS

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BACKGROUND AND OBJECTIVES
In China, iodine-deficient (water iodine concentration (WIC)<40 μg/L), iodine-adequate (40 μg/L ≤ WIC ≤ 100 μg/L), and iodine-excess (WIC >100 μg/L) areas coexist, and the definition of iodine-adequate area was first formulated in 2020. This study aimed to evaluate the iodine nutritional status of non-pregnant women in different water iodization areas using different evaluation indicators.
METHODS
From iodine extra-high areas (IEHA), iodine-excess areas (IEA), iodine-adequate areas (IAA), inland iodine-deficient areas (IIDA), and coastal iodine-deficient areas (CIDA), 1991 non-pregnant local women were randomly selected. An iodine-specific dietary frequency questionnaire was used to investigate women's total dietary iodine intake (TII). Spot urinary iodine concentrations(SUIC), salivary iodine concentrations(SIC), and serum iodine concentrations(BIC) were tested and assessed. SUIC<100 μg/L, iodine defciency; 100–199 μg/L, adequate; 200–299 μg/L, above requirements;≥300 μg/L, excessive.
RESULTS
The RESULTS of WIC, iodized salt coverage rate（CR）, women's TII, SUIC, SIC, and BIC in the five areas are shown in Table 1. There were signifcant differences in WIC ($\chi2$=1874.97, P<0.001), CR ($\chi2$=899.94, P< 0.001), SUIC ($\chi2$=890.44; P < 0.001), SIC ($\chi2$=762.22; P< 0.001), TII ($\chi2$=1296.50, P < 0.001), and BIC($\chi2$=890.44; P < 0.001) among the five regions. SIC was strongly correlated with SUIC(r=0.66, P<0.001).TII(r=0.53, P<0.001), BIC(r=0.46, P<0.001), and SUIC were moderately strongly correlated, respectively.

Variables	CIDA	IIDA	IAA	IEA	IEHA	Total
CR(%)	4.0	89.7	26.6	8.8	4.0	24.5
WIC,μg/L	17.4	4.9	79.5	290.0	771.5	226.8
TII,μg/d	170.9	264.2	191.2	545.6	898.0	321.6
SUIC,μg/L	98.1	144.8	179.0	448.0	606.4	232.2
SIC,μg/L	78.3	113.4	163.6	287.8	677.3	199.0
BIC,μg/L	58.9	59.6	62.1	67.4	76.1	64.1

CONCLUSIONS
Women in CIDA had mild iodine deficiency due to the low coverage of iodized salt. IIDA had high iodized salt coverage, resulting in iodine-suitable status for women. Women in IAA were in an adequate iodine state. Women in IEA and IEHA were in an iodine-excess state due to high WIC.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_368

PRESCHOOL CHILD PHYSIQUE INFORMATION SOURCES AND MATERNAL RECOGNITION IN JAPAN

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BACKGROUND AND OBJECTIVES
The purpose was to: (1) clarify the sources of information on the appropriate physique of Japanese mothers and preschool children (hereinafter, referred to as information sources); and (2) consider the relationship between information sources and the recognition of the physiques of preschool children by their mothers.
METHODS
In 2024, we conducted an online survey on the physiques of Japanese mothers and preschool children (self-reported), the recognition of an preschool children physique from the mother's perspective, information sources, and food intake frequency, targeting 1,400 mothers living with preschool children between the ages 3 to under 6. We calculated dietary scores from food intake frequencies (This score is higher for undesirable eating habits). Physiques were classified into three groups: high (≥ BMI 75%ile), middle (25%ile to < 75%ile), and low (< 25%ile). The consistency and inconsistency between the physique classification and physique recognition of the preschool children from the mother's perspective were defined as the physique/awareness classification and classified as overestimation, agreement, or underestimation. Relevant factors were considered based on a multinomial logistic regression analysis, with physique classification or physique/recognition classification as dependent variables and question items as independent variables.
RESULTS
The subjects for analysis were 1362 preschool children (670 boys and 692 girls). Most mothers listed the Maternal and Child Health Handbook (Handbook) as their information source. Those who did not have the opportunity to know the appropriate physique of preschool children were more significantly higher dietary scores. According to a multinomial logistic regression analysis, the only factor that showed a significant positive association among the low, overestimation, and underestimation groups was not using the Maternal and Child Health Handbook as an information source.
CONCLUSIONS
Although many mothers listed the Handbook as an information source, many in the low group, underestimation group, and overestimation group did not consider the Handbook to be an information source. It was considered necessary to further utilize the Handbook in order to understand the appropriate physique of preschool children.
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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_369

THE INFLUENCE OF FAMILY ENVIRONMENTAL FACTORS ON YOUNG CHILDREN'S EATING HABITS IN JAPAN

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BACKGROUND AND OBJECTIVES
Early childhood is a period of intense physical and mental growth when lifelong dietary habits are established. In recent decades, the family environment has changed, with a decrease in the number of three-generation families and an increase in the number of nuclear families and working mothers. This study was conducted to determine how the increase in the number of nuclear and dual-earner families is related to time and financial freedom, how these parameters affect eating habits in and out of the home, and which family environmental factors influence kindergarteners' eating habits.
METHODS
A self-administered questionnaire-based survey was administered to 265 kindergarten students and their parents (response rate 73.8%) in Japan. The questionnaires were distributed and collected by kindergartens. Survey items included parents' age, employment status, awareness of nutrition education, and time and financial freedom; children's age and eating behavior; family structure; and frequency of eating out. An eating habit score up to 13 was given based on how many foods children disliked, how often foods that children disliked were served at home, how often meals were skipped, and how often families ate together. Participants with scores of ≥9 and <9 were assigned to high and low groups, respectively. Statistical analyses were conducted using SPSS ver. 22.0.
RESULTS
Of the participants, 68.8% were full-time homemakers. Families whose children helped with household chores every day had fewer disliked foods ($p = 0.04$). Eating habits scores of 9 or higher were attributed to 53.2% of participants, and eating habit scores tended to be higher among families who reported having less time to spare ($p = 0.06$). Although a higher percentage of dual-earner families reported having less time to spare, there was no difference in the frequency of eating out between participants with different employment statuses.
CONCLUSIONS
We found that the perception of lack of time in dual-income families was not directly related to an increase in eating out. This may be because parents who feel they have less time are more proactive in promoting healthy behaviors, including nutritional education. In addition, children tended to have fewer likes and dislikes in families where "children help with household chores." This suggests that raising parents' awareness of healthy food behaviors may lead to the formation of desirable eating behaviors in their children.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_370

ANALYSIS OF ANEMIA STATUS AND RELATED FACTORS OF PRIMARY AND SECONDARY SCHOOL STUDENTS IN BEIJING

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BACKGROUND AND OBJECTIVES
Anemia is not only an important indicator of children's nutritional status, but also an important factor affecting their health. Students with anemia may experience symptoms such as palpitations, shortness of breath, dizziness, blurred vision, and poor concentration, which can lower their learning and sports abilities, reduce their resistance, and even affect their normal growth and development.The purpose of this study is to understand the anemia status and related influencing factors of junior and middle school students in Beijing and to provide a basis for relevant departments to formulate targeted intervention strategies and measures.
METHODS
Based on the data of Beijing Students' nutrition literacy survey in 2022-2023, a total of 14181 students in grades 3-12 were included in the study. The mean±standard deviation ($\bar{x}\pm s$) was used to describe the hemoglobin level, and the rate was used to describe the anemia. Independent sample t test and one-way analysis of variance were used to compare the differences in hemoglobin levels between two groups and multiple groups, and chi-square test was used to compare the differences in anemia rates between different groups. Multivariate logistic regression was used to analyze the related factors of anemia.
RESULTS
The average level of hemoglobin was (140.48±13.23) g/L, and the prevalence of anemia was 2.26%. The prevalence of anemia was lower in boys (1.90%) than in girls (2.62%), and higher in urban (3.28%) than in suburban (1.73%).Multivariate Logistic regression analysis showed that:boys,primary grades 3 to 6,suburban areas as reference,girls (OR=1.357,95%CI:1.078-1.708),junior high schools (OR=4.119,95%CI:2.869-5.914),senior high schools (OR=6.492,95%CI:4.526-9.311) and urban students (OR=1.877,95%CI:1.493-2.361) had a higher risk of anemia (all P<0.05).
CONCLUSIONS
The prevalence of anemia still existed among primary and middle school students in Beijing, especially girls,junior and senior high school students and urban students. It is necessary to pay attention to the related departments and carry out active surveillance and targeted intervention.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_371

THE OBESITY RATE IN CHILDREN WITH INTELLECTUAL DISABILITY IN EAST ASIAN COUNTRIES; CHINA, KOREA, TAIWAN, HONG KONG AND JAPAN; A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES
It has not well documented on the obesity rate in children with intellectual disability in whom a higher prevalence of obesity rate. The aim of the scoping review study is to compare the prevalence of obesity in children with intellectual disability in east asia, and disscuss the factors influencing the rate.
METHODS
A literature search was carried out on the PubMed, CINAHL, Medline and Ichushi-Web (in Japanese). Search terms included “obesity” and “children with intellectual disability”, and “China”, “South Korea”. “Hong Kong”, “Taiwan”, “Mongolia” or “Japan”. The inclusion criteria were: papers should be published in English or Japanese; the full-text articles appear in peer-reviewed journals; the research targeted children with intellectual disabilities (aged 3-18 years).The exclusion criteria were reviews, case reports, intervention studies, proceedings and studies targeting specific patients, such as those presenting with Prader-Willi syndrome, Bardet-Biedl syndrome, Baraitser-Winter syndrome, Cohen syndrome and mental health disorders. However, Autism and Down’s Syndrome were included. Two persons screened the RESULTS.
RESULTS
In total, 12 studies were identified. The obesity rate was varied between studies. The previous studies reported the prevalence to be around 35% in Taiwanese children with intellectual disabilities who were enrolled in all public special education schools in Taiwan (2), around 30% in Chinese children with intellectual disabilities(4), and around 20% in Japanese children(3). These findings determined that children with intellectual disabilities are more at risk of becoming overweight or obese than typically developing children. The obesity rate in children with down syndrome who reffered from two place was reported 83% by Taiwanese study(1). The recruit methods, number of participants, participant rate, weight and height measurment methods, the place of study may infulience on obesity rate.
CONCLUSIONS
Obesity rates of children with intellectual disabilities was varied from 20%-nearly 40%. More acculate methods to obtain the obesity rate is required.
CONFLICTS OF INTERESTS
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EPO5_373

ASSOCIATIONS BETWEEN SERUM 25-HYDROXYVITAMIN D LEVELS AND THE RISK OF DEMENTIA: A MENDELIAN RANDOMIZATION STUDY IN UK BIOBANK

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BACKGROUND AND OBJECTIVES
Serum vitamin D deficiency has been reported to be associated with dementia in clinical research. While most linear Mendelian randomization (MR) studies found a null effect of vitamin D on the risk of dementia, a non-linear relationship remains unclear. Our aim was to apply the non-linear MR design to investigate the association between serum 25-hydroxyvitamin D concentration and the risk of dementia.
METHODS
We analyzed 447,469 participants from the UK Biobank (mean age, 56 years). First, to corroborate previous observational analyses, participants were categorized into five groups based on serum 25-hydroxyvitamin D levels, with the lowest quintile (Q1) serving as the reference group. Linear regression was used to compare each of the other quintile groups with Q1 to test the association between vitamin D levels and the risk of dementia. Second, using nonlinear MR approaches, we evaluated for nonlinearity in the genetical relationship between serum 25-hydroxyvitamin D concentration on the risk of dementia. A comprehensive MR analysis of serum 25-hydroxyvitamin D concentration required us to also model the risk of dementia, given that the two are strongly correlated.
RESULTS
We found an inverse association between serum 25-hydroxyvitamin D levels and the risk of dementia. Compared to the lowest quintile (Q1, <29), participants in the higher quintiles showed lower hazard ratios (HR) for dementia, with HRs of 0.85, 0.77, 0.69, and 0.72 for Q2 through Q5, respectively. This trend suggests that higher vitamin D levels may be associated with a reduced risk of dementia, with the strongest risk reduction observed in Q4 (52–66), where the HR was 0.69 (95% CI: 0.64–0.72, p=2.0×10-16). MR analysis showed a modest but significant reduction in dementia risk in participants with serum 25-hydroxyvitamin D levels in the fourth quintile (Q4, 50–53), with an odds ratio of approximately 0.998 (p = 0.002). Other quintiles did not show statistically significant associations with dementia risk.
CONCLUSIONS
Our findings suggest a potential protective effect of higher serum 25-hydroxyvitamin D levels against dementia, particularly within a specific range (50–66 nmol/L), indicating a non-linear relationship that warrants further investigation.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_375

EFFECTS OF EARLY NEONATAL ADMINISTRATION OF LACTIPLANTIBACILLUS PLANTARUM ATCC 202195 WITH OR WITHOUT FRUCTOOLIGOSACCHARIDES ON THE FECAL MICROBIOME OF INFANTS IN DHAKA, BANGLADESH

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BACKGROUND AND OBJECTIVES

Interventions aimed at altering the composition of the gut microbiome have the potential to reduce neonatal morbidity and mortality in low- and middle-income countries where the burden of neonatal mortality remains high. This randomized controlled trial investigated the effects of *Lactiplantibacillus plantarum* ATCC 202195 (LP), provided either as a synbiotic with fructooligosaccharide (LP+FOS) or alone (LP), on the fecal microbiome composition and bacterial diversity in infants living in Dhaka, Bangladesh.

METHODS

Infants were randomized to receive LP (10^9 CFU/5 mg LP + 250 mg maltodextrin; n=103), LP+FOS (10^9 CFU/5 mg LP + 150 mg FOS + 100 mg maltodextrin; n=102), or placebo (250 mg maltodextrin; n=100) orally once daily for 7 days. Stool samples (n=2,079) collected at scheduled visits from birth to day 180 of life were analyzed using shotgun metagenomic sequencing. Outcomes included overall and subgroup analyses of alpha diversity (Shannon and Simpson indices) by delivery mode, beta diversity (unweighted and weighted Unique Fraction [UniFrac]), and differential taxonomic and pathway abundance.

RESULTS

LP or LP+FOS did not significantly affect alpha diversity overall relative to placebo ($p>0.05$). However, among infants delivered via C-section, Shannon ($p=0.009$) and Simpson indices ($p=0.015$) were higher in the LP+FOS group compared to placebo beyond 60 days of age. LP and LP+FOS affected beta diversity measured with unweighted UniFrac (no differences for weighted UniFrac) up to 60 days, but there were no differences beyond 60 days of age.

The relative abundance of the probiotic genus (*Lactiplantibacillus)* was increased in both LP and LP+FOS relative to placebo, although *Lactiplantibacillus* was present at low abundance overall (0.04%) even during the intervention. *Bifidobacterium* (predominantly *B. longum*) dominated the microbiota of all three groups (59%) during and after the probiotic intervention. LP and LP+FOS influenced a few low-abundance bacterial genera (e.g. *Lacticaseibacillus, Leuconostoc*), but did not affect the dominant bacterial taxa. Among the 101 metabolic pathways investigated, the abundance of four pathways was higher in the LP and LP+FOS groups relative to placebo, including the carotenoid biosynthesis pathway, which positively correlated with the abundance of *Lactiplantibacillus.*

CONCLUSIONS

Among infants in Dhaka, Bangladesh, LP provided either as a probiotic or synbiotic had minor and short-term effects on the fecal microbiota composition and did not alter either the overall diversity or the abundance of dominant bacterial taxa.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_376

HEALTH CLAIMS DRIVE CONSUMER PREFERENCE FOR FRESH PRODUCE: A WILLINGNESS TO PAY AND SEGMENTATION STUDY IN THE NETHERLANDS

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BACKGROUND AND OBJECTIVES
Nutrition and health claims (NHC) on fresh produce can aid consumers in making conscious, healthier choices, and the producers in positioning their products (1,2). Prior research shows that consumers' intention to buy increases when products depict health and nutrition claims (3); however, most research is done on processed foods (4). Therefore, this study aims to assess and understand consumers' preferences and personal characteristics associated with a perceived added value of food claims on fresh produce and, secondly, to identify the individual predictors of food claims use.
METHODS
A willingness to pay study (5) assessed Dutch consumers' perceptions, preferences and characteristics of white asparagus bearing origin declaration and vitamin C and B9 NHC. Multinomial logit models (MNL) (6) estimated the effect of attributes on WTP and preference heterogeneity was tested with latent class analysis. Further analysis details can we founder elsewhere (7).
RESULTS
Our findings show that health claims were preferred to nutrition claims; in any case, consumers elicited a higher WTP for vitamin C claims. When we studied the consumer's segmentation, 3 groups were clearly distinguished: those that preferred any claims but were very price conscious (63.3%), a health claims-oriented group (20.5%), and a smaller group (16.2%) that preferred only origin declaration produce. Predictors of classes were self-reported reading of price and labels, ability to process claims, and need for information. Those more attentive to price had higher chances of belonging to class 1, and those with higher self-reported ability and interest were probably consumers with higher preferences for health claims (class 2).
CONCLUSIONS
Producers can use health claims on commonly known vitamins, e.g., vitamin C, and on a second level of importance, declare the origin of their produce to increase the positioning and purchase of their fresh produce.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_377

PARTNER SUPPORT IN PREGNANCY AND ITS ASSOCIATED FACTORS

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BACKGROUND AND OBJECTIVES

Pregnancy is a critical phase in a woman's life, demanding not only effective healthcare delivery but also social and emotional support to enhance their quality of life and well-being. This need is pronounced in many African regions, where maternal mortality is high, with limited information on the scope of partner support during pregnancy and the associated factors influencing it. This study assessed the magnitude of partner support and related factors among pregnant women.

METHODS

A 31-item point score scale designed by experienced scientists was administered to 394 pregnant women (gestational age ≥13 weeks) to assess self-reported partner support in pregnancy. The score was dichotomized by the mean score into "inadequate" (<24.7) or "adequate" (≥24.7). Also, the odds ratio (OR) and 95% confidence interval (CI) of factors associated with partner support were estimated using logistic regression at a two-sided $P<0.05$.

RESULTS

Overall, mean age was 30.1±5.6 years, and 284 (72.1%) reported adequate support from their partners. Women with tertiary education (OR: 2.76; 95%CI: 1.23, 6.17) and women that are Christian (OR: 2.25; 95%CI: 1.35, 3.76) were at higher odds of receiving adequate partner support during pregnancy.

CONCLUSIONS

Interventions targeting underlying beliefs about women's education and access to health information could improve their negotiating power, fostering greater partner support during pregnancy. This could improve health outcomes and the overall quality of life for women throughout their life course.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_378

LONGITUDINAL ASSOCIATION BETWEEN SELENIUM INTAKE AND HEALTHY LIFE EXPECTANCY: AN 11-YEAR GLOBAL SPATIOTEMPORAL STUDY

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BACKGROUND AND OBJECTIVES
Healthy life expectancy (HALE) is a healthy life span that does not require assistance or nursing care from others. Selenium is one of the essential minerals and has important biological functions, including antioxidant properties, that may be associated with HALE. The purpose of this study is to determine the relationship of selenium intake with life expectancy (LE) and HALE over an 11-year period from 2010 to 2021 using international data.
METHODS
Average life expectancy (LE) by country was obtained from the World Bank database, and healthy life expectancy (HALE) was obtained from Global Burden of Disease (GBD) database. Estimated selenium intake by country was obtained from the Global Dietary Database (GDD). As covariates, we used GDP per capita, aging rate, years of education, smoking rate, physical activity, obesity rate, energy supply, sodium intake, average systolic blood pressure, and average LDL cholesterol concentration obtained from the World Bank database and other sources. We analyzed the association of selenium intake in 2010 with LE and HALE over the following 11 years in countries with populations of 1 million or more using linear mixed models controlling for covariates. All explanatory variables were centralized. Statistical software R was used for the analysis.
RESULTS
The fixed effects (standard error) of selenium intake on LE and HALE were 0.024 (0.010), p=0.015 and 0.018 (0.008), p=0.035, both showing significant positive associations. The interaction between year and selenium intake was not significant for both LE and HALE, and the effect of selenium on LE and HALE did not differ by year.
CONCLUSIONS
Intake of selenium is associated with increased LE and HALE, according to an analysis using 11 years of international data.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_379

ASSOCIATION BETWEEN THE STATUS OF HEALTH AND FOOD STOCKPILING FOR DISASTER AMONG JAPANESE

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BACKGROUND AND OBJECTIVES
Climate-related disasters have occurred frequently globally as a result of global warming. Japan's geography makes it vulnerable to natural disasters, particularly earthquakes; but its preparedness is far from satisfactory. Moreover, disruptions to logistics and the supply chain during disasters can lead to food shortages. It is therefore essential to prepare for disasters in daily life by stockpiling food at home. The objective of this study is to investigate the association between the degree of health and food stockpiling for disasters across Japan.
METHODS
This study was conducted during November 25-29, 2022, using an online questionnaire, aimed to recruit 2000 Japanese individuals aged ≥ 20 years registered with an online survey company. The questionnaire consisted of five categories with a total of 20 items including screening questions, participants' characteristics, awareness and measures of disasters, disaster prevention knowledge, and the degree of health, and food stockpiling for disasters. To assess the degree of health, the 12-item simplified health scale used in the study. Excluding respondents who answered 'no answer' of sex and answered 'unknown' of household income were analyzed (n=1634). Association between sociodemographic characteristics of participants and food stockpiling were assessed through a chi-squared test. Additionally, logistic regression analysis was performed to assess the association between the degree of health and food stockpiling.
RESULTS
A total of 57.9% (n=946) of participants had stockpiled food for disasters. Regarding the degree of health, 11.9% of the participants had a high level of health, while 52.5% had a low level. After adjusting for all variables, the associated factors were gender, family composition, household income, disaster experience and disaster prevention knowledge. Meanwhile, the degree of health had a positive effect on food stockpiling for disasters in physical health, social health and comprehensive health ($p < 0.001$ for all). However, the effect of mental health was not significant with food stockpiling. Compared with low degree of health, high degree of health was more likely to stockpile food for disasters (adjusted OR: 2.26, 95% CI: 1.57-3.25).
CONCLUSIONS
Factors such as disaster experience and disaster prevention knowledge had a significant association with food stockpiling for disaster. Having a high degree of health associated with food stockpiling. Improving the degree of health may contribute to increasing household food stockpiling for disasters.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_380

THE IMPACT OF DIET, ENVIRONMENT, AND LIFESTYLE ON CONSTIPATION IN SCHOOLCHILDREN

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BACKGROUND AND OBJECTIVES
The prevalence of childhood constipation has been reported to range from 0.7% to 29.6% in previous studies. Lifestyle factors, such as a high-fiber diet and regular exercise, are widely recognized as beneficial for improving bowel movements. However, studies exploring the factors associated with childhood constipation, particularly those related to lifestyle and nutritional knowledge, remain limited.
The purpose of this study is to assess the prevalence of constipation among school children and identify its associated factors.
METHODS
This study recruited 428 participants, focusing on elementary school students in grades 4 and 5. A questionnaire survey method was utilized to examine the students' lifestyle and bowel habits.
RESULTS
The sample consisted of 313 schoolchildren (137 boys and 176 girls), with an average valid questionnaire recovery rate of 73%. The prevalence of constipation was 24.6% (77 children, with a gender distribution of boys: 36, girls: 41). Girls were more likely to experience constipation than boys (46.8% vs. 53.2%, $p=0.634$). A lower intake of fruits was significantly associated with a higher incidence of constipation ($p<0.05$). Parents with higher education levels, particularly those with education above the college level, reported a lower prevalence of constipation in their children ($p<0.05$). Additionally, parents who had regular meal intake patterns were found to have children with a lower incidence of constipation ($p < 0.05$).
CONCLUSIONS
Research indicates a significant correlation between low consumption of vegetables and fruits and constipation. Establishing regular eating habits in parents can reduce the risk of constipation in schoolchildren. For children with parents who have lower levels of education, it is important to strengthen nutritional education to reduce the incidence of constipation.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_381

DIFFERENCES IN NUTRIENTS AND DIETARY INTAKE OF JAPANESE FEMALE JUNIOR HIGH SCHOOL STUDENTS WITH DIFFERENT SALT REDUCTION AWARENESS

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BACKGROUND AND OBJECTIVES
Hypertension is the lifestyle-related disease with the highest prevalence in Japan. Reducing salt intake during adolescence is very important. However, in Japan there are few reports on the association between salt reduction awareness and salt intake and dietary habits among adolescent students. The purpose of this study was to clarify the difference in salt reduction awareness and daily dietary intake among female junior high school students.
METHODS
This study design was a cross-sectional study. The participants of this study were 327 female second-year students from a Japanese junior high school aged 13 to 14 years. After excluding those with incomplete questionnaires, we analyzed 278 participants (85 % valid response rate). A self-completion dietary habits survey and a brief-type self-administered dietary history questionnaire were used. Those who answered “yes” to the question “Do you reduce salt in your diet?” in the dietary habits survey were defined as the salt reduction awareness group and those who answered “no” were defined as the non-salt reduction awareness group. Nutrient and food group intakes were adjusted using the density method. Energy, nutrients and food group intakes were compared between groups by t-test. Dietary habits were compared between groups by chi-square test. Statistical significance was set at $p < 0.05$.
RESULTS
The salt reduction awareness group consisted of 117 participants (42.1 %) and the non-salt reduction awareness group consisted of 161 participants (57.9 %). There were significant differences in energy and salt intake between the two groups (energy intake: 2,061 ± 690 vs 2,230 ± 671 kcal, $p < 0.05$; salt intake: 5.8 ± 1.1 vs 5.5 ± 1.1 g/1,000 kcal, $p < 0.05$). Potassium, vegetable and fish intake were higher and sweet intake was lower in the salt reduction awareness group compared to the non-salt reduction awareness group ($p < 0.05$).
CONCLUSIONS
Nutrient and food intakes differed according to salt reduction awareness, in Japanese female junior high school students.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_382

ARE APPLES WE EAT RADIOACTIVE? LONG-TERM INVESTIGATION (1968-2023) OF CS-137 IN APPLES

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BACKGROUND AND OBJECTIVES
Due to the consequences of nuclear and/or radiological accidents in the past (Chernobyl,Fukushima, etc.), and potential future events of that kind, the constant monitoring of foods we consume is important. Ingestion is one of the pathways of the transfer of radionuclides from environment to humans. Food ingestion greatly contributes to the total effective dose; hence, it is of great importance to investigate exposure to radionuclides through food. In this paper we present the RESULTS of a long-term investigation of Cs-137 concentrations in apples in northwestern Croatia for the period 1968–2023
METHODS
The apple samples (10 kg obtained from the open market) were dried at 105 C for 2–3 days, and then ashed at 400 C for 24 h. The samples were packed in 200 mL plastic cylindrical containers and the Cs-137 activity concentration was determined using high-resolution gammy-ray spectrometry. To estimate the risk to human consumption, we calculated factors such as: the effective ecological half-life of Cs-137 in apples, the radioecological sensitivity, and the effective dose to adults.
RESULTS
The highest Cs-137 activity concentrationin apples was measured in 1986, decreasing exponentially ever since. The Fukushima-Daiichi accident in 2011 did not cause a significant increase in Cs-137 activity concentration, although the presence of the consequent fallout was detected via the appearance of Cs-134 in some parts of the environment. The observed residence time for Cs-137 in apples was estimated to be 4.5 and 3.9 years for the pre-Chernobyl and post-Chernobyl periods, respectively. The estimated effective dose received by adult members of theCroatian public due to intake of radiocaesium from apples over the overall observed period is 6.4 μSv.
CONCLUSIONS
We can conclude that the consumption of apples was not a critical pathway for the transfer of radiocaesium to humans. However, constant monitoring of radioactivity in foodstuffs is crucial in case new radiological accidents occur.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_383

EATING DISORDERS IN UNIVERSITY STUDENTS AND THEIR RELATIONSHIP WITH BODY COMPOSITION AND BODY SATISFACTION

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BACKGROUND AND OBJECTIVES
Background: Eating disorders (ED) have increased in frequency. DIfferent risk groups for developing this psychiatric illnes have been identified, including young adults and especially adolescents and university students due their social interactions, lifestyles and use of social networks (Kabakus, 2021). Some of the risks identified for the development of eating disorders are the dissatisfaction and distorsion of the body image that is associated with the nutritional statutal of the subjects (Jiménez-Limas, 2022). Early detection and prevention of this condition is necessary for good mental health of young adults Aim: to assess the risk of developing ED in university students using the SCOFF questionnaire and to correlate the findings with body composition and body image perception.
METHODS
500 students of both sexes, between 18 ans 30 years old were evaluated anthropometrically using InBody 270, and their body image was assessed using Stunkard silhouettes, and they were invited to answer the SCOFF questionnaire, which consists of 5 questions.
RESULTS
A high prevalence of 44% was found for the risk of ED, and a significant relationship with sex was observed (chi square, $p<0,01$), with women being the most frequently at risk (63%). Individuals at risk of ED had more wheight, higher BMI and more body fat and less muscle than subjects without the risk (t-student, $p=0,001$, $p=0,0001$, $p=0.0001$ and $p=0.01$, respectively). Significant association was foud between body dissatisfaction and distorsion and ED (chi square, $p<0.0001$, for both). The risk analysis showed that body image, especially body dissatisfaction increases the risk of ED in 3.3 times, also the female sex increases the risk in 2.5 times. Hypephagia was the contition most frequent between all ED (63%)
CONCLUSIONS
The RESULTS show that female sex, dissatisfaction and underestimation of body image are the main risk factors for the development of ED between university students. These data allow for the generation of targeted interventions to prevent the ocurrence of this contition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_386

THE AVAILABILITY, ACCESSIBILITY AND CONSISTENCY OF ALLERGEN INFORMATION OF FOOD PRODUCTS ON ONLINE FOOD RETAILERS AND MEAL DELIVERY WEBSITES IN SOUTH AFRICA

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BACKGROUND AND OBJECTIVES
The post-pandemic environment accelerated the digitalisation of society, motivating retailers to develop online purchasing and delivery services. However, digital retail platforms vary in the provision of nutrition and allergen information likely attributed to the lack of legislation regulating these modern developments. The study aimed to assess the availability, accessibility, and consistency of allergen information across online food retailers and meal delivery websites in South Africa.
METHODS
A cross-sectional descriptive study was conducted. Data was collected using validated observational checklists to evaluate online food retailers (n= 10) and meal delivery websites (n=8) that met the inclusion criteria.
RESULTS
All the products assessed (n=109) across the online food retailers' websites and 33.00% (8 of 24) of products on meal delivery websites had general food labelling displayed. Fifty three percent of products on online food retailers' websites and 58.33% on meal delivery websites displayed any type of allergen information. Across online food retailers, 53.33% required zero clicks and 46.67% required one click to reach the allergen information, while on meal delivery websites, 57.00% required zero clicks and 42.86% required one click. For online food retailers, one had to scroll to locate allergen information 81.03% of the time and meal delivery websites 71.00% of the time. Seventy seven percent and 85.71% of products on online food retailers and meal delivery websites respectively, that displayed allergen information, had an allergen heading. All the online food retailers, and 87.50% of meal delivery platforms had a search bar function, creating the capacity to search for allergen-free foods.
CONCLUSIONS
The findings are mostly positive as the majority of products across online food retailers and meal delivery websites had allergen information available that were easily accessible. However, more should be done to ensure the inclusion of allergen information on all digital platforms to create an enabling food environment for consumers with allergies.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_387

PERCEPTIONS AND SELF-REPORTED USE OF FOOD AND NUTRITION LABELLING AMONGST YOUNG ADULTS AT A TERTIARY INSTITUTION IN SOUTH AFRICA: A MIXED-METHODS STUDY

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BACKGROUND AND OBJECTIVES
Young adults are faced with multiple environmental changes as they transition into a new phase of life. They create new lifestyles, preferences, and habits, that can impact determinants of health and the risk of non-communicable disease development. Food and nutrition labelling (FNL) is an effective tool to promote healthy purchasing decisions, by enabling a consumer to make informed food choices. This study aimed to determine the perceptions and self-reported use of FNL in young adults.
METHODS
An explanatory sequential mixed methods study design was employed. The study population consisted of undergraduate students (18-25 years of age) at a tertiary institution in South Africa. Quantitative data was collected using an online survey (N=1137), followed by the collection of qualitative data by means of three focus group discussions (N=23). Quantitative data was analysed using mainly descriptive statistics, while thematic analysis of qualitative data was done.
RESULTS
Majority (92.57%) of survey participants considered FNL important, supported by feedback from focus group participants (FGP), who found them informative and necessary for health reasons. Almost half (43.97%) of survey participants associated price of food items with quality. However, food prices (90.06%) as opposed to nutrition composition (33.17%) was the main factor influencing purchasing decisions. Additionally, FGP reported budget constraints, lack of nutrition knowledge and labels not being user-friendly as large contributors for ignoring FNL and desire more standardised food labelling to aid in the identification of relevant nutrition information.
CONCLUSIONS
While young adults recognised the importance of FNL, barriers such as price, lack of nutrition knowledge and the lay-out hindered its effective utilization. Recommendations include education on the use and importance of FNL in schools, standardised FNL and having better enforcement of the labelling legislation to help increase consumer trust in food labels.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_388

ASSOCIATIONS OF MEAL PREPARATION EXPERIENCES DURING SCHOOL AGE AND ADOLESCENCE WITH DIETARY BEHAVIORS AMONG FEMALE UNIVERSITY STUDENTS IN JAPAN

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BACKGROUND AND OBJECTIVES
Previous research has shown that involvement in meal preparation, such as helping to prepare meals in childhood, is associated with healthier eating habits later in life. Few studies have examined in details on meal preparation experiences in childhood. The purpose of this study was to determine the association between meal preparation experiences during school age and adolescence and dietary behaviors of female university students in Japan.
METHODS
A cross-sectional survey was conducted for 326 female first-year university students majoring in nutrition in 2021. A total of 298 students (91.4%) answered the survey and 293 valid responses were used for the analysis. Three variables on current dietary behaviors were used: frequencies of eating well-balanced meal, primary cooking, and breakfast consumption. Two sub-scales of the questionnaire of meal preparation competency for female university students were used to assess meal preparation experiences in childhood: 4 items on experiences with assisted meal preparation during primary school and 7 items on experiences with independent meal preparation during middle and high school. Participants were divided into two groups by a current eating behavior and compared meal preparation experiences in childhood using chi-square test. Binary logistic regression analysis was performed using meal preparation experiences in childhood as independent variables and a current dietary behavior as a dependent variable adjusted for demographic variables.
RESULTS
Of the study subjects, 69.6% lived with their family and 49.1% were comfortable with their living arrangements. The score of “experiences with assisted meal preparation during primary school” was associated with current frequency of eating well-balanced meal. Two items, including those whose families were more willing to have them help with cooking, had significantly higher odds ratios of eating well-balanced meal at least twice a day. The score of “experiences with independent meal preparation during middle and high school” was associated with current frequency of primary cooking. Six items, such as often planning and cooking by oneself, were related, and the odds ratio of current primary cooking frequency of 3 or more days per week was significantly higher for those who had experienced independent meal preparation in middle and high school. There was no association between frequency of eating breakfast and meal preparation experiences.
CONCLUSIONS
To ensure that university students practice eating behaviors that lead to better health, meal preparation experiences at each stage of school age and adolescence is crucial.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_391

ACCEPTABILITY TESTING OF PROTOTYPES OF MULTIPLE MICRONUTRIENT SUPPLEMENTS FOR A DOSE-FINDING TRIAL IN WOMEN OF REPRODUCTIVE AGE IN KENYA

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BACKGROUND AND OBJECTIVES
Data from supplementation studies in The Gambia and Bangladesh indicate that the dose of micronutrients in UNIMMAP may not be adequate for pregnant women in low-or middle-income countries (LMICs) with inadequate diets. Prior to a randomized controlled dose-finding trial with 3 arms: control dose of 15, test dose 1 and test dose 2 of 24, multiple micronutrients supplements (MMS), to correct micronutrient deficiencies in women of reproductive age in Kenya, we conducted a sensory test to choose the most tolerable formulation and flavour.
METHODS
Three different formulations of each dose each in 2 flavours (orange and mango), were colour coded and double-blind tested 40 times on a panel of 90 non-pregnant women.Women aged 18 to 35 years were recruited randomly from a list of residents supplied by a local demographic surveillance system. The women gave written informed consent. Each woman was randomly allocated to test 4 different prototypes in one session, with bread or crackers given in between. Each pack of MMS powder was dissolved in 200mls of bottled water. Each woman was asked to taste 100 ml of each solution and rate tolerability on a 7-point Likert scale (from 1 “dislike very much” to 7 “like very much”) and asked for their comments on the flavour. Lack of tolerability for each formulation was judged on the frequency and intensity of dislike on the Likert scale. Following unblinding, the final choice of formulation was made via elimination of the most intensely disliked. Preference for mango or orange was assessed by comparing median Likert ratings for each flavour.
RESULTS

Formulation	Intolerable (%)	Neutral (%)	Tolerable (%)	Median
Full-strength orange	9	4	47	6
Full-strength mango	19	4	37	5
Without iron orange	29	0	31	5
Without iron mango	28	0	32	5
Half-strength orange	13	6	41	5
Half-strength mango	11	2	47	6

CONCLUSIONS
The full-strength formulation in orange flavour ranked highest in Likert ratings and was chosen for the main trial
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_393

IMPLEMENTATION AND EVALUATION OF NUTRITION EDUCATION ON APPROPRIATE PORTIONS PER SINGLE MEAL AND WELL-BALANCED FOOD COMBINATIONS USING LUNCH BOXES FOR JUNIOR HIGH SCHOOL STUDENTS AND THEIR PARENTS IN JAPAN

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BACKGROUND AND OBJECTIVES
The purpose of this study was to provide nutrition education to Japanese junior high school students and their parents regarding the appropriate portions per single meal along with well-balanced food combinations using lunch boxes, then evaluate the RESULTS thereof.
METHODS
The study included 147 first-year junior high school students (7th grade) enrolled in private A junior high school in Japan and 49 parents with children enrolled in A junior high school. In October 2024, students and parents were each provided the education regarding the appropriate portion per single meal and well-balanced food combinations using lunch boxes and a self-administered questionnaire survey was conducted before and after the education. The survey covered knowledge about the appropriate portions per single meal, the appropriate proportion of grain dishes, vegetable dishes, and fish and meat dishes, as well as how to combine desired cooking methods. The data before and after the education were examined using the McNemar test.
RESULTS
The analysis subjects included 119 students and 40 parents who had complete data before and after the education and whose answers were complete. The correct response rate for items related to the appropriate portions per single meal changed from 4.2% to 32.2% for students before and after the education, but remained at 10.0% for parents (students $p<0.001$, parents $p=1.00$). The correct response rate before and after the education for items related to the appropriate portion of grain dishes, vegetable dishes, and fish and meat dishes, changed from 6.7% to 89.1% for students and from 22.5% to 95.0% for parents (both $p<0.001$). The correct response rate before and after the education on the items related to desired cooking method combinations changed from 16.0% to 85.7% for students and from 32.5% to 97.5% for parents (both $p<0.001$). Following the education, when asked if they were confident that the content of this education could be utilized in daily meals and diets, 90.8% of students and all parents responded that they were confident that they could utilize it.
CONCLUSIONS
It was suggested that implementing the education using lunch boxes for junior high school students and their parents could positively contribute to increasing knowledge about appropriate portions per single meal and well-balanced food combinations. However, since this questionnaire was conducted immediately after the education, continued research is necessary to determine whether or not such dietary knowledge has been firmly established.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_394

EXPLORING THE DIFFERENCE IN DIETARY INTAKE BETWEEN NORMOSMIC AND HYPOSMIC ELDERLY NURSING HOME RESIDENTS

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BACKGROUND AND OBJECTIVES
Declining perception of olfactory function together with functional changes in the body with progression of age potentially reduces the pleasures of consuming food in elderly population. These changes consequently lead to reduced food intake, contributing to monotonous diet and nutrient deficiency increasing the risk of disease. The aim of this study was to investigate whether there is decline of olfactory perception, analyze dietary intake, and explore possible associations of olfactory function and dietary intake in elderly people.
METHODS
Participants were 123 (76% F) elderly nursing home residents. Olfactory impairment was measured by The European Test of Olfactory Capabilities with total maximum score of 32. Cut-off values were determined for each decade. Decline of olfactory perception was established by comparison of the RESULTS between of elderly group (≥ 65 y) and adult group (18-64 y). Dietary intake was assessed by 24-hour recalls on two separate days collected by the nutritionist. Food portion booklet was used as an aid to estimate the portion sizes of foods consumed, also recipes and portion sizes were obtained from kitchen personnel. Collected data were energy, macro- and micro-nutrients intake. Dietary intake was analyzed by Genesis R&D with added regional and local food data base (ESHA, Salem, OR).
RESULTS
Based on the RESULTS of ETOC 65% of elderly participants had hyposmia, significantly higher compared to 15% in adult population. Average dietary intake of elderly population was 95% of recommendation for energy intake, 140% of proteins, 90% of carbohydrates, 46% of fiber and 113% of fat. Hyposmic participants had significantly lower intake of B vitamins, vitamin C and vitamin E compared to normosmic participants. The main source of B vitamins in the diet of elderly nursing home residents was cereals, and hyposmic population had significantly lower intake of cereals ($p < 0.03$), the main source of vitamin C was fruits and vegetables, and for vitamin E meat eggs, hyposmic participants had significantly lower intake then normosmic ($p<0.009$).
CONCLUSIONS
Lower dietary intake and lack of adherence to dietary recommendations of elderly people has significant impact on occurrence of frailty and development of malnutrition. RESULTS of this study suggest that individuals with reduced perception of smell could have higher risk of nutritional deficiencies particularly for vitamins. Determining olfactory function during nutritional screening should be considered due to potential influence on health and general food intake.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_395

THE EFFECT OF DIFFERENCES IN DIETARY AWARENESS AMONG COLLEGE BASEBALL PLAYERS ON THEIR DIETARY HABITS

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BACKGROUND AND OBJECTIVES
In this study, we aimed to investigate the eating awareness and eating habits of university baseball players and examine the relationship between differences in food awareness, eating habits, and physique.
METHODS
After obtaining approval from the University Ethics Committee, players belonging to the university baseball team were asked to participate in the study and consent was obtained. Of the 80 participants, six were excluded from the analysis owing to incomplete survey content, while 74 were included. The analysis included measurements of height and body composition (InBody430, InBody Japan Inc.) and a questionnaire survey. For the dietary survey, participants were instructed to record their meals and take photos on two exercise days and one rest day. The contents will be confirmed in an interview in the near future, and nutrient and food group intakes will be calculated using Excel Eiyo-kun ver. 8.0 (Kenpakusha Co., Ltd.). For the comparison of continuous variables, unpaired t-tests or Mann-Whitney U tests based on normality were used, and chi-square tests were used for categorical variables. Statistical analyses were performed using IBM SPSS ver. 23, with a significance level of 5%.
RESULTS
Based on their responses to the question, "Are you aware of your dietary intake to improve your performance?", participants were divided into an "awareness" group (n=55) and a "non-awareness" group (n=19), and their dietary intake was compared. There were no significant differences in grade or position between the two groups; however, the "awareness" group was significantly taller and had a significantly lower body fat percentage. When adjusted for height squared, the "awareness" group also had a significantly higher lean body mass index. Regarding food group intake, the "awareness" group consumed significantly more total vegetables, soybeans, and oils and fats.
CONCLUSIONS
As there was a significant difference in body composition due to differences in dietary awareness, raising dietary awareness may be important for building athletes' bodies. Most of the subjects lived in dormitory rooms, and even in a limited food environment. The group with high dietary awareness had a significantly higher intake of soybeans, which was thought to be due to the effort to add natto (traditional Japanese fermented soybean), and other foods to their diet. This shows the importance of raising dietary awareness through dietary education to build athletes' bodies.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_396

FACTORS ASSOCIATED WITH LEFTOVER SCHOOL LUNCHES ~IN JAPANESE JUNIOR HIGH SCHOOL LUNCHES~

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BACKGROUND AND OBJECTIVES
School-age children are in an important phase for developing their dietary habits, and nutrition education should be tailored to their development. In addition, school lunches in Japan are designed to be delicious and leave no leftovers, supporting the healthy growth of students. However, the percentage of leftover food in school lunches at public junior high schools in S City, Osaka Prefecture, has risen. Therefore, the actual situation must be understood to prevent the trend of increasing leftovers of school lunches. The purpose of this study was to investigate the factors related to students' uneaten food, to clarify the actual situation and issues, and to link this to future nutrition education activities.
METHODS
The target schools for the survey were private junior high schools in Osaka Prefecture, Japan, where the purpose of the survey was explained to the principals, and their informal consent was obtained. This junior high school is affiliated with Senri Kinran University, and 73 junior high school students enrolled at this junior high school were the study subjects. In September 2023, the researcher personally administered in each class a questionnaire. The survey included information on the number of leftovers, confidence in eating school lunches, likes and dislikes of school lunches, sleeping time, and time spent on the Internet.
RESULTS
A total of 71 students were analyzed (40 first-year students, 17 second-year students, and 24 third-year students) for a valid response rate of 97%. The status of school lunch leftovers was 32 (45.1%) and 39 (54.9%) respondents who answered that they "always eat all" and "sometimes leave or always leave," respectively. The tendency to leave food uneaten was significantly greater the higher the school year. The relationship between sleep time and Internet usage time according to school lunch leftover status was examined. The longer the time spent using the Internet both on weekdays and weekends, the more likely they were to leave food. The wider the range of sleeping hours between weekdays and weekends, the more food was left uneaten.
CONCLUSIONS
This study found that students' regular lifestyle affects their eating habits regarding leftovers from school lunches. In the future, nutrition education activities for adolescent junior high school students should focus on sleep time and educate them to think about the dangers of Internet time.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_397

PERILLA OIL AND THE OIL IN COMBINATION WITH EITHER NOBILETIN-RICH PONKAN POWDER OR ANREDERA CORDIFOLIA LEAF POWDER ATTENUATE COGNITIVE DECLINE WITH AGING IN HEALTHY ELDERLY JAPANESE INDIVIDUALS: A DOUBLE-BLIND, RANDOMIZED, PARALLEL-ARMED STUDY

Michio Hashimoto[1]; Matsuzaki Kentaro[2]; Maruyama Koji[3]; Wakatsuki Harumi[2]; Ohno Miho[4]; Kuroda Yoko[1]; Kato Setsushi[4]; Shido Osamu[5]; Nagai Atsushi[1]
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BACKGROUND AND OBJECTIVES
Docosahexaenoic acid (DHA) included into fish oil has major roles in the cognitive function and mental health of humans. As the consumption of fish, but, is steadily declining, we must consider alternative foods for DHA. As a-linolenic acid (ALA) is converted to eicosapentaenoic acid (EPA) and DHA, we investigated the effects of dietary *perilla* seed oil (PO), a rich source (54–64%) of ALA, and PO combined with either nobiletin-rich ponkan powder (PP) or *Anredera cordifolia* leaf powder (AC) intake on cognitive functions and mental health in healthy elderly Japanese individuals.
METHODS
We carried out two human interventional trials: a 1-year, double-blind, randomized, parallel-armed study in healthy elderly Japanese individuals. Volunteers aged 60-84 years were randomly divided into either two or three groups: one trial consisted of a control and a PO (7 mL/day)-administered (PO) groups, and the other trial consisted of three groups which were administered a PO (1.47mL/day), and a PO combing either 1.12 g PP or 1.12g AC. At baseline and after 12 months of intervention, cognitive function, mental health condition, the fatty acid profile of the red blood cell plasma membranes (RBC-PM), and serum biochemical parameters were evaluated.
RESULTS
After 12 months of intervention, the PO group showed significantly higher cognitive index scores than the control group, accompanied by increases in ALA levels in RBC-PM and serum biological antioxidant potential. At the end of the intervention for 12 months, the POPP and POAC groups showed generally higher cognitive index scores than the PO group, associated with increased ALA, EPA, and/or DHA levels in RBC-PM, increased serum biological antioxidant potential, and decreased serum triglyceride, and *N*-(epsilon)-carboxymethyl-lysine (CML), an advanced glycation end-product and biochemical marker of oxidative stress levels.
CONCLUSIONS
The combined long-term supplementation with PO and either PP or AC more effectively ameliorates age-related cognitive decline than PO alone. These findings may serve as a basis for the development of new supplements for brain health.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_399

FAST-FOOD CONSUMPTION AND PHYSICAL ACTIVITIES IMPACT ON BODY WEIGHT AMONG YOUNG PRIVATE-SECTOR EMPLOYEES

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BACKGROUND AND OBJECTIVES
This study seeks to comprehensively examine the influence of fast-food consumption and physical activity levels on the body weight of young employees within the private sector of Sri Lanka. The escalating popularity of fast food has raised concerns about its nutritional content and associated health ramifications. A cohort of 100 individuals aged between 25-45, employed in Sri Lanka's private sector, participated in this research. These participants provided sociodemographic data through a standardized questionnaire, enabling the characterization of their backgrounds. Participants disclosed their frequency of fast-food consumption and engagement in physical activities, utilizing validated assessment tools.

METHODS
The collected data was meticulously compiled into an Excel spreadsheet and subjected to rigorous statistical analysis. Descriptive statistics, such as percentages and proportions, were employed to delineate the body weight status of the participants. Employing chi-square tests, our study identified significant associations between fast-food consumption, levels of physical activity, and body weight categories. Furthermore, through binary logistic regression analysis, potential risk factors contributing to overweight and obesity within the young employee cohort were elucidated.

RESULTS
Our findings revealed a disconcerting trend, with 6% of participants classified as underweight, 32% within the normal weight range, and a substantial 62% categorized as overweight or obese. These outcomes underscore the alarming prevalence of overweight and obesity among young private-sector employees, particularly within the bustling urban landscape of Colombo, Sri Lanka. The data strongly imply a robust correlation between fast-food consumption, sedentary behaviors, and higher body weight categories, reflective of the evolving lifestyle patterns associated with the nation's economic growth.

CONCLUSIONS
This study emphasizes the urgent need for effective interventions to counter the detrimental effects of fast food consumption. The implementation of awareness campaigns elucidating the adverse health consequences of fast food, coupled with comprehensive nutritional education, can empower individuals to make informed dietary choices. Workplace interventions, including the provision of healthier meal alternatives and the facilitation of physical activity opportunities, are essential in fostering a healthier workforce and mitigating the escalating burden of overweight and obesity in Sri Lanka.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_400

VARIETY AND FREQUENCY OF FRUIT AND VEGETABLES EATEN BY YOUNG NEW ZEALAND CHILDREN

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BACKGROUND AND OBJECTIVES
Habitually consuming a variety of fruit and vegetables (FVs) is important for diet quality, growth, development and prevention of non-communicable diseases in children (Ramsay 2017, Hodder 2024). Despite amassing evidence relating to the health benefits of FV intake and variety in the early stages of life, little is known about the frequency and variety of FVs consumed by young children in Aotearoa New Zealand (NZ). The objective of this study was to explore FV intake in diets of young NZ children aged 1-4 years.
METHODS
This observational cross-sectional study utilised data from the Young Foods New Zealand study. Two 24-hour dietary recalls and socioeconomic data from 289 children aged 1-4 years were collected. Variety was measured as the number of different FV categories consumed over the 2 day diet recall, with each type of FV consumed given a score of 1 (e.g. if an apple was consumed twice, it was counted once). Independent t-tests and one-way ANOVAs determined differences between variety scores and demographic characteristics.
RESULTS
The children (female n=147, 51%) had a mean(SD) age of 2.5(0.9) years. Bananas (n=204, 71%) and carrots (n=142, 49%) were the fruit and vegetable children consumed the most. The least consumed vegetable group was leafy greens (n=60, 21%). Fruit Variety Scores (FVS) ranged from 0 to 9 with the highest proportion of children (22%) obtaining a 3. Vegetable Variety Scores (VVS) ranged from 0 to 11 with the highest proportion of children (15%) obtaining a 4. Mean VVS was significantly higher in households with one child (VVS=5.4) than those with four or more children (VVS=3.5) (p=0.013, 95% CI=0.25, 3.4). The socioeconomic deprivation category of the household influenced FVS, with differences seen between those in the low (FVS=3.6) and high (FVS=2.9) deprivation categories (p=0.048, 95% CI=0.01, 1.35). Children of respondents on unpaid leave had significantly higher FVS (FVS=4.8) than those on paid parental leave (FVS=2.9) (p=0.031, 95% CI=0.10, 3.62), those not working (FVS=3.0)(p<0.001, 95% CI=0.66, 2.97), and those who worked part-time (FVS=3.3) (p=0.004, 95% CI=0.3, 2.64). Children of respondents who achieved a university-level education had a significantly higher FVS (FVS=3.8) compared to children of school (FVS=2.8) educated respondents (p=0.003, 95% CI=0.26, 1.56).
CONCLUSIONS
Young children's fruit and vegetable (FV) variety scores were associated with socioeconomic factors. The findings highlight FV consumption patterns among young children in Aotearoa NZ and warrant further research into socioeconomic influences.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_401

DIETARY AND LIFESTYLE CORRELATES OF IRON STATUS AMONG PREGNANT ADOLESCENTS BETWEEN THE AGES 15 TO 19 YEARS

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BACKGROUND AND OBJECTIVES
Pregnancy places female adolescents who in general are at a risk of low iron status at even greater risk. This study aimed to assess the association between dietary and lifestyle practices and iron status of pregnant adolescents between the ages 15 to 19 years.
METHODS
A cross-sectional study was conducted on 120 adolescent pregnant adolescents attending antenatal clinics at three conveniently selected hospitals in the municipality. A well-structured questionnaire was used to gather dietary and lifestyle data. Haemoglobin levels were measured. Data were analyzed using SPSS and Microsoft Excel. Chi-square was used to measure association between dietary and lifestyle and iron status.
RESULTS
There was a significant association between breakfast intake, fruit and vegetable intake, physical activity and pica intake and iron status of participants (p= 0.002, 0.021, 0.002, 0.000 and 0.037 respectively). However, there was no statistically significant relationship between herbal medication intake and iron status (p= 0.981) of study participants.

CONCLUSIONS
About a quarter of the participants had low iron status. An impactful way to improve the iron status of pregnant adolescents is to encourage the intake of breakfast, fruits and vegetables and minimizing pica practice.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_402

EXPLORING FOOD AND NUTRITION-BASED SOCIAL ENTERPRISE MODELS AS INNOVATIVE SOLUTIONS FOR FINANCIAL SUSTAINABILITY IN EDUCATION-BASED SETTINGS: A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES
Most school-based food and nutrition programs are discontinued within two years due to insufficient external funding, underscoring the need for alternative financial models. This scoping review explored what operational models exist within education-based settings that deliver on food and nutrition-based outcomes for students (with implementation greater than one year).
METHODS
Scoping review methodology was applied in November 2024, with data cross-checked for currency via Google. Eight databases were searched (PubMed, Web of Science, Embase, Cinahl, Social Science Database, Sociological Abstracts, Business Source Complete, ABI/Inform Collection). The included articles were synthesised narratively.
RESULTS
Five food and nutrition-based social enterprises were identified in educational contexts through case studies. Three were in the United States of America, one in New Zealand and one in Israel. Three enterprises utilised a targeted customer service model, selling healthy meals or snacks within educational settings and to other institutions or food retailers. One enterprise followed a social business model, using revenue from corporate catering to fund free school meals. One enterprise employed a combined employment and social business model, providing employment to women to prepare school meals.
CONCLUSIONS
Targeted customer service and social business models can contribute to creating health-promoting educational environments whilst generating revenue for self-sustainability. There is a need for more rigorous, formal evaluations beyond case studies to assess education-based food and nutrition social enterprises. Social enterprises should be integrated into public health strategies as potential solutions to sustain health promotion food and nutrition programs long term.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_403

THE RELATIONSHIP BETWEEN NUTRITIONAL INTAKE AND ACTIVITY LEVELS OF CHILDREN AMONG UNDERPRIVILEGED COMMUNITIES IN CEBU, PHILIPPINES

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BACKGROUND AND OBJECTIVES
Child undernutrition in the underprivileged communities of Cebu, Philippines is a problem, but we conducted this investigation because we do not have a detailed understanding of the situation in order to improve it.
METHODS
The survey period is from June to August 2024. The subjects were 119 people (46 males, 73 females) under the age of 15 living in three districts. We investigated the amount of food intake and daily activities on a given day.
RESULTS
Average energy intake for men and women was 1,627 kcal for ages 1-2, 1,129 kcal for ages 3-5, 1,141 kcal for ages 6-9, 1,221 kcal for ages 10-12, and 1,354 kcal for ages 13-15, which was lower than the recommended intake in the Philippines for both men and women. . On the other hand, protein intake was similar for both men and women. The nutrients they lacked were calcium, iron, zinc, iodine, vitamin C, and dietary fiber, and their salt intake was high. The average total daily activity was 51 METs.
CONCLUSIONS
Now that the nutritional deficiencies have been identified, nutritional education will be recommended to residents.
CONFLICTS OF INTERESTS
There are no conflicts of interest.

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EPO5_404

A SCOPING REVIEW OF DIETARY INTAKE AMONG YOUNG ADULTS IN LOW- AND MIDDLE-INCOME COUNTRIES

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BACKGROUND AND OBJECTIVES
The dietary intake of young adults is a critical area of study, particularly in low- and middle-income countries (LMICs), where rapid urbanization and economic changes influence food availability, dietary choices, and overall nutrition. Young adults (18 to 30 years) are at a transitional life stage marked by shifts in lifestyle and independence, which often impact their dietary intake and nutritional status. Poor dietary intake during this period can increase the risk of chronic diseases such as obesity, diabetes, and cardiovascular issues, which are rising concerns in LMICs. This scoping review aims to investigate current knowledge on dietary intake among young adults in LMICs, highlighting their energy and nutrient intakes.
METHODS
Literature search was conducted via several databases which includes Ovid MEDLINE, PubMed, Scopus, Web of Science and EBSCOhost to identify observational studies published in English from 1st January 2014 to 31st July 2024. The methodology outlined by the Joanna Briggs Institute (2020) and Arksey and O'Malley et al. were followed. Rayyan.ai was used to remove duplicates and facilitate the study selection process, which was independently carried out by two researchers. Studies that reported on the energy and nutrient intake of healthy young adults from the general community, aged 18-30 years in LMICs were included. The protocol for this review has been registered on the Open Science Framework (Registration DOI: https://doi.org/10.17605/OSF.IO/XZKBA).
RESULTS
A total of 14 studies were included (nine from upper-middle income countries, five from lower-middle income countries, none from low-income countries). Majority of the studies are cross-sectional (71.4%). The energy intake of young adults from upper-middle income countries varies, ranging from 1700 – 2400kcal/day. Young adult females in lower-middle income countries showed patterns of low energy and insufficient consumption of micronutrients. Most of the energy intake reported came from carbohydrate-based food sources, followed by fat and protein.
CONCLUSIONS
This review highlighted the need for more research in low-income countries and provided an overview of nutritional intake among young adults from the upper- and lower-middle income countries, which is essential for informing policies and interventions aimed at improving public health outcomes.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_405

Typology of out-of-home-eaters: RESULTS from a large French cohort

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BACKGROUND AND OBJECTIVES
Given the high number of people in Western countries who regularly eat out of home (OOH) in various settings, the OOH consumption sector probably has an important lever potential towards more sustainable and healthier diets. As the understanding of OOH consumer profiles is crucial to identify levers of action, the objective of the study was to identify a typology of OOH consumers and to describe these groups in terms of socio-demographics, lifestyle and diet.
METHODS
Based on a sub-sample of a large French cohort (n = 29,140), the typology of OOH consumption patterns was constructed using a multiple factor analysis followed by hierarchical ascending classification and k-means procedures. ANCOVA models adjusted for energy intake were applied to compare the groups' characteristics. The comparisons covered socio-demographic characteristics, lifestyles and diet-related nutritional (using dietary scores) and environmental factors (greenhouse gas emissions, land use and energy consumption) including at home and OOH consumption.
RESULTS
Five clusters of individuals were identified based on their OOH consumption patterns: 1) Weekday-only eaters (19%); 2) Frequent weekday and weekend eaters (24%); 3) Organic eaters (6%); 4) Weekend and evening eaters (19%) and 5) Home-only eaters (32%). The RESULTS showed significant differences in sociodemographic and diet-related factors between the groups. Individuals who frequently consumed OOH generally were younger and had a higher socio-economic status as well as a diet of poorer nutritional quality and greater environmental impacts. Participants who tended to choose organic options when eating OOH were more likely to follow specific diets, and showed healthier overall diets with lower environmental pressures.
CONCLUSIONS
Our RESULTS underline that OOH target groups are various and suggest the existence of a link between certain dietary and socio-demographic factors and OOH consumption habits.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_406

VITAMIN D STATUS AND ASSOCIATION WITH INFLAMMATION, DIETARY INTAKE, COGNITIVE PERFORMANCE AND DEPRESSION IN UNIVERSITY STUDENTS AFTER SUMMER BREAK

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BACKGROUND AND OBJECTIVES
Vitamin D deficiency is a widespread issue in Poland due to limited sun exposure during the fall, winter, and spring. This study aims to assess the concentration of 25(OH)D in university students and examine its associations with vitamin D intake, inflammation, body composition, cognitive performance, and depressive symptoms.
METHODS
The participants (n = 62) were university students (aged 18–30 years) of both sexes, with no chronic diseases. The study was conducted in October 2024. During the study session, blood samples were collected, body composition was measured using air displacement plethysmography (BodPod, Cosmed, Italy), and cognitive testing was conducted using the Stroop Color Test, the Wisconsin Card Sorting Test, and the Word Fluency Test. Vitamin D intake was assessed with a previously validated food frequency questionnaire for the Polish population. Depressive symptoms were evaluated using the Beck Depression Inventory II (BDI-II) and the Patient Health Questionnaire-9 (PHQ-9). Serum 25(OH)D and C-reactive protein (CRP) concentrations were measured using ELISA methods with commercial kits (EIA-5396, DRG, Germany; DM E-4600, LDN, Germany). Data analysis was performed using the Mann–Whitney test and Spearman correlation in Statistica 13 (StatSoft, USA).
RESULTS
Among the participants, 23% had vitamin D deficiency, 58% had insufficiency, and only 19% had sufficient 25(OH)D concentrations. Vitamin D supplementation was reported by 46% of participants. Serum 25(OH)D concentrations were positively correlated with total vitamin D intake from diet and supplementation ($r_s = 0.30$, $p < 0.05$). Participants who supplemented vitamin D had significantly higher 25(OH)D concentrations compared to those who did not supplement (15.3 ± 9.2 ng/mL vs. 22.3 ± 12.7 ng/mL, $p = 0.027$). No significant associations were observed between 25(OH)D concentrations and CRP levels, cognitive performance, or depressive symptoms.
CONCLUSIONS
Vitamin D deficiency and insufficiency are common among university students in Poland, even in October, following the summer season. Despite nearly half of the participants reporting vitamin D supplementation, insufficient 25(OH)D levels remain prevalent. Serum 25(OH)D concentrations were positively correlated with vitamin D intake from diet and supplementation. Further research is needed to establish appropriate vitamin D supplementation dosing for this demographic to mitigate deficiency risk.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_408

IMPACT OF ULTRA-PROCESSED FOOD INTAKE ON DIET QUALITY AND ITS ASSOCIATION WITH GESTATIONAL DIABETES MELLITUS: THE MUTABA'AH STUDY

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BACKGROUND AND OBJECTIVES
The increasing intake of Ultra-Processed Food (UPF) has raised concerns about the potential role of UPF to impair maternal diet quality and increased risk of Gestational Diabetes Mellitus (GDM). This study aimed to evaluate the associations between UPF intake and adherence to the Mediterranean Diet and risk of GDM among pregnant women in the United Arab Emirates (UAE).
METHODS
The analysis included 1054 pregnant women from the dietary sub-cohort conducted between 2019-2022 within the Mutaba'ah prospective cohort study in UAE. Dietary data was assessed through a semi-quantitative food frequency questionnaire, and UPF intake in energy-adjusted servings/day was classified according to the NOVA system. The alternate Mediterranean Diet (aMED) score for pregnancy, was used to assess adherence to the Mediterranean Diet. GDM diagnosis was assessed based on the National Institute for Health and Clinical Excellence criteria. Logistic regression analysis was used to assess associations between UPF intake and aMED score (continuous or tertiles) and GDM.
RESULTS
Mean±SD of UPF intake was 9.4±3.4 servings/day and aMED score was 4.0±1.5. Pregnant women in the highest tertile of UPF intake had lower aMED score, compared to women in the lowest tertile (4.3±1.4 vs. 3.6±1.4, $P<0.001$). Also, women in the highest tertile of UPF intake had lower intakes of protein, total fat, monounsaturated fatty acids, vegetables, fruits, red-meats, legumes, nuts and higher intakes of carbohydrates, saturated fatty acids, sodium, selenium, whole grains and sweetened beverages compared to those in the lowest tertile ($P<0.05$). No significant associations were found between UPF intake (continuous or tertiles) and GDM (OR=0.97, 95% CI: 0.92-1.03, OR=0.85, 95% CI: 0.54-1.34, respectively). Similarly, no significant associations were found between aMED score (continuous or tertiles) and GDM (OR=0.99, 95% CI: 0.87-1.11, OR=0.94, 95% CI: 0.54-1.64, respectively).
CONCLUSIONS
Among pregnant women from the UAE, higher intake of UPF was associated with a lower adherence to the Mediterranean Diet. However, our findings didn't show any association between UPF intake or aMED score and the risk of GDM. Further research is needed to clarify the effects of UPF intake during pregnancy.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_410

DEVELOPMENT OF WHOLE GRAIN BREAD SUITABLE FOR EVENING MEALS AND ITS NUTRITIONAL AND FUNCTIONAL PROPERTIES

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BACKGROUND AND OBJECTIVES
Whole grain bread is well-known for its health benefits, including cholesterol regulation, suppression of postprandial blood glucose spikes, and prolonged satiety, making it a valuable functional food for preventing lifestyle-related diseases. However, due to its poor palatability and texture, it isn't widely consumed on a daily basis especially in Japan.Furthermore the impact of late-night meals on sleep quality has become a significant concern, particularly for individuals with irregular eating schedules. This study aimed to develop 100% whole grain bread optimized for late-night and to evaluate its effects on blood glucose and sleep quality.
METHODS
To improve the baking quality and palatability of 100% whole grain bread, we adjusted gluten levels and incorporated additional ingredients such as whole eggs, yogurt, and sourdough. As a result, adding 6–8% gluten and 15% whole eggs significantly improved the bread's volume and texture, while pre-gelatinizing 10% of the whole grain flour enhanced its moist texture and overall palatability. Subsequently, a sensory evaluation was conducted with 43 participants (aged 18–70) to select the most palatable product among three types of whole grain bread. Finally, an open-label crossover trial was performed using the highest-rated whole grain bread. Participants consumed either whole grain bread or white bread as part of their dinner and late-night meal, and blood glucose levels were monitored using a continuous glucose monitoring system. Sleep quality was evaluated using OSA-MA scores.
RESULTS
The trials on baking quality and palatability revealed that appropriate levels of gluten and whole egg additives improved bread specific volume, softness, and taste. Baking further enhanced the flavor profile, particularly for younger age groups, and the product containing whole eggs received ratings comparable to those of white bread. In the human trial, whole grain bread consumption significantly suppressed postprandial blood glucose spikes compared to white bread. Furthermore, subjective sleep quality, including parameters such as ease of falling asleep and reduced morning fatigue, improved significantly with whole grain bread consumption. When no late-night meal was consumed, participants reported worsened sleep onset due to hunger, leading to lower subjective sleep scores.
CONCLUSIONS
This study demonstrates that appropriately formulated 100% whole grain bread serves as a functional option for late-night meals, improving glycemic control and promoting better sleep quality. These findings suggest that whole grain bread could be a valuable dietary choice for individuals with busy lifestyles or irregular eating schedules.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_413

A QUALITATIVE STUDY ON BREASTFEEDING EXPERIENCES OF EMPLOYED MOTHERS IN MANUFACTURING, RETAIL AND PUBLIC SECTORS AT DESIGNATED WORKPLACES

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BACKGROUND AND OBJECTIVES
The work environment presents major challenges for breastfeeding mothers through the physical separation of the mother and the baby post maternity leave. The objective of the study was to explore the experiences of employed breastfeeding mothers from designated workplaces (with more than 50 employees) in Worcester, South Africa.
METHODS
A qualitative study was conducted using focus group discussions (FDGs). Employed breastfeeding mothers from designated retail, manufacturing and public workplaces were recruited from local communities. Eligible participants were those who had exclusively or predominantly breastfed their children for up to 6 months and had given birth within the last 24 months. A community fieldworker recruited participants and coordinated scheduling for the FDGs.
RESULTS
Five FDGs (N=24) were conducted. The mothers described returning to work as emotionally and logistically challenging. Those who continued breastfeeding while working demonstrated a strong commitment to and belief in breastfeeding. Consistent enabling factors and main sources of support mentioned included immediate family members, such as grandmothers, siblings and spouses. The challenges identified were a lack of private spaces and time to express breastmilk at work, an unsupportive workplace culture and a lack of work-life balance.
CONCLUSIONS
There is a need for psychosocial support for breastfeeding mothers to manage the emotional demands of returning to work and logistical support, such as providing breastfeeding spaces and time for expressing breastmilk. Human resource managers, occupational health nurses and wellness officials should inform mothers about the recommendation to provide breastfeeding breaks at work. Advocacy efforts with workplaces on the importance of breastfeeding support should be initiated.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_414

THREE-YEAR CHANGES IN DIET QUALITY AND LOX-INDEX AMONG JAPANESE WORKERS

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BACKGROUND AND OBJECTIVES
A high-quality diet based on adherence to dietary guidelines or recommendations has been associated with decreased risk of cardiovascular disease (CVD) (1). The Japanese Food Guide Spinning Top (JFGST) (2) has also been associated with lower CVD risk (3,4). However, the association between JFGST and atherosclerosis, a precursor to CVD, is unclear. We therefore examined the association between three-year changes in JFGST score and LOX-index, a predictive biomarker of atherosclerosis and CVD (5), among Japanese workers.
METHODS
Participants were 226 workers (121 men and 103 women aged 19-66 years) with no history of serious disease who participated in both the baseline and 3-year follow-up surveys. Dietary intake was assessed using a validated self-administered diet questionnaire. JFGST score was evaluated on a scale of 0 to 70 (high adherence) based on the number of servings of grain dishes, vegetable dishes, fish and meat dishes, milk, and fruits; total energy intake; and energy from snacks and alcoholic beverages (2,3,4). Participants were divided into three groups based on the change in JFGST score over the 3-year period: decreased score (> -2 points), maintained score (≤ ±2 points), and improved score (> +2 points). LOX-index was calculated by multiplying serum concentration of the soluble form of lectin-like oxidized LDL receptor-1 by those of LOX-1 ligands containing apolipoprotein B (5). Multiple regression analysis was used to estimate the geometric mean of LOX-index after 3 years according to change in JFGST score.
RESULTS
Change in JFGST score was not associated with LOX-index after 3 years in either the age- and sex-adjusted or multivariable-adjusted models. Multivariable-adjusted geometric means (95% confidence intervals) of LOX-index after 3 years were 1,147 (1,031–1,276) for the decreased score group, 1,096 (975–1,233) for the maintained score group, and 1,275 (1,135–1,433) for the improved score group (*P* for trend = 0.23).
CONCLUSIONS
Our RESULTS suggest that three-year change in JFGST score was not associated with LOX-index among Japanese workers.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_416

EFFECTIVE COVERAGE OF WASTING MANAGEMENT IN ETHIOPIA

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BACKGROUND AND OBJECTIVES

Child wasting and acute malnutrition are life-threatening conditions that increase the risk of death and serious illnesses. Despite efforts such as the Global Action Plan on Child Wasting, which aims to reduce the wasting prevalence to less than 3% by 2030, challenges persist, with Ethiopia recording a 7.2% rate. A major shortcoming of the global strategy is contact coverage, which often overlooks the service quality. Effective coverage that measures the quality of health services offers a solution. Thus, the objective of this study is to assess the effectiveness of child wasting management in six regions of Ethiopia.

METHODS

A secondary analysis of cross-sectional data obtained from household and institutional surveys was performed. A total of 1440 children aged 6-59 months were included in the study. For the household survey, participants were selected using a multistage cluster sampling approach, and 72 health posts were selected health posts were selected randomly from six regions. By combining household data with expanded measures of health facility readiness and process quality from health posts, the quality-adjusted coverage was calculated.

RESULTS

Contact coverage for severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) was 40% and 37%, respectively. The readiness scores for providing SAM and MAM services at health posts were 57.9% and 53.9%, respectively. The input-adjusted coverage for SAM and MAM considering facility readiness was 23% and 20%, respectively. The coverage adjusted for receipt of complete intervention was 7% for the SAM and 8% for the MAM. Quality-adjusted coverage for SAM and MAM were 4% and 3%, respectively.

CONCLUSIONS

Efforts to address acute malnutrition in the Ethiopian health system show commendable progress but also highlight critical gaps and inconsistencies. A holistic, quality-driven approach is needed to effectively combat child-wasting in Ethiopia.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_417

CHARACTERISTICS OF FOOD INTAKE AS INDEXED BY DIETARY SODIUM-TO-POTASSIUM RATIO

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BACKGROUND AND OBJECTIVES
Recently, the urine sodium-to-potassium (Na/K) ratio has attracted worldwide attention for hypertension prevention; however, there are few reports relating urine Na/K ratios to diet. Therefore, the objective of this study was to identify the food intake characteristics that reduce urine and dietary Na/K ratios.
METHODS
A total of 126 female college students participated in this study. Dietary records (food-weighted method and photographic method), physical measurements, and 24-h urine collection were conducted on two non-consecutive weekdays and holidays. Nutritional calculations were performed using the Standard Tables of Food Composition in Japan (Eighth Revised Edition)-Updated and Enlarged Version 2023, and energy and nutrient intakes were calculated considering the cooking methods. The median of the average dietary salt and K intake over 2 days was divided into four groups: I salt: low K: high, II salt: high K: high, III salt: low K: low, IV salt: high K: low. Urinary Na and K excretions, energy and nutrients intakes, and intakes of food group were compared among the four groups.
RESULTS
The participants had a mean age of 19.3 ± 0.8 years, a height of 158.0 ± 4.5 cm, a weight of 53.7 ± 6.7 kg, and a BMI of 21.5 ± 2.5 kg/m2. The median energy and nutrient intakes [25-75P] were 1614 [1411-1776] kcal, 2865 [2143-3415] mg sodium, 1985 [1689-2324] mg potassium, and 7.3 [5.5-8.6] g salt. The median of Na/K ratio of the diet was 1.6 [1.4-1.8] mmol/mmol in groupI, 2.6 [2.4-2.9] in groupII, 2.1 [1.9-2.5] in groupIII and 3.2 [2.9-4.1] in groupIV. Dietary as well as urinary Na/K was lowest in group I and highest in group IV ($p<.001$). The ratio in the appropriate BMI range was the highest in groupI (90.6 %). In terms of dietary intake, group I consumed significantly more protein, potassium, calcium, iron, vitamin B12, and pantothenic acid, and significantly less salt than group IV. In terms of food group intake, group I consumed significantly more beans, vegetables, seafood (excluding processed foods), and dairy products (excluding cheese) than group IV and significantly fewer cereals (wheat and processed wheat products).
CONCLUSIONS
It is important to incorporate dairy products (milk and yogurt) with low salt content, as well as vegetables and fruits, to reduce the Na/K ratio in the urine and diet.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_418

THE IMPACT OF NUTRI-SCORE ON CONSUMER CHOICES IN POLAND - FINDINGS FROM THE NATIONWIDE, CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
In recent years, there has been an increasing discussion about common front-of-pack labelling in Europe. One candidate is the Nutri-Score (NS) system, popular in some of the European Union countries. There are no independent studies on its effectiveness in Poland, where it is used as a voluntary label. The aim of the study was to assess the impact of the Nutri-Score system on Polish consumers making healthier dietary choices.
METHODS
The cross-sectional study was conducted over March and April 2024 with CAWI technique. A representative sample of the Polish population, consisting of 1,035 respondents, participated in the study. These respondents were recruited from a research panel and regularly make their grocery purchases in retail chains. The study utilized a questionnaire that included metric questions and assessments of nutritional knowledge. It also evaluated familiarity with the Nutri-Score system. Additionally, participants engaged in a simulated product selection task, choosing one item from each of eight product pairs based on their health value, both with and without the Nutri-Score system visible.
RESULTS
A large proportion of respondents were not familiar with the NS system prior to the survey (33.2%) or did not understand its meaning (25.6%). The majority of respondents obtained their knowledge of it from product packaging (65.4%). Almost 37% pay attention to this system ‘sometimes’ when shopping. The average score achieved in the nutritional knowledge test was 5.6±2.14 out of a possible 10 points. The average score obtained by respondents in the NS labelling knowledge test was 2.9±1.66 out of a possible 7 points. Of the 8 pairs of products, only for one pair the study participants made a more favourable nutritional choice after the NS system was made visible. For 2 pairs, they made no change, while for 5 pairs a less favourable nutritional choice was made after making the score visible. Statistical significance was, however, shown for only 2, negative changes ($p<0.001$). There was a correlation between nutritional knowledge and quality of choices with both invisible ($p<0.001$, rho=0.216) and visible ($p<0.001$, rho=0.164) labelling.
CONCLUSIONS
Our study suggests a minor impact of the system on consumers' food choices. The RESULTS indicate that it does not guarantee an improvement in the choice of products with better nutritional and health properties. Nutritional knowledge remains essential for informed dietary decisions. Further studies are needed to assess the usefulness of the NS in improving the public's diet and making better nutritional choices.
CONFLICTS OF INTERESTS
This study was funded by the Fundusz Promocji Owoców i Warzyw (Fund for the Promotion of Fruits and Vegetables).

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EPO5_419

GESTATIONAL WEIGHT GAIN AND EXPERIENCES OF WOMEN LIVING WITH GESTATIONAL DIABETES MELLITUS

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BACKGROUND AND OBJECTIVES
Gestational diabetes mellitus (GDM) is a common pregnancy complication which can result in serious adverse effects. GDM carries long-term health risks with an 8-10-fold increased risk of developing Type 2 diabetes mellitus (T2DM) within 3-6 years post-pregnancy [1,2]. Excessive gestational weight gain is a key contributor to, T2DM progression and developing obesity [3], yet many women receive little guidance on weight management [4], and the adverse effects. This study aimed to evaluate weight changes during pregnancy and explore knowledge and current weight management practices in women with GDM.
METHODS
Pregnant women aged 18-45 years old attending an antenatal clinic between Nov 2023 - Dec 2024 following a GDM diagnosis were invited to participate. 123 women with GDM completed an anonymous questionnaire investigating their experiences of weight management during pregnancy. Of these, 97 women consented to be weighed at 3 time-points during pregnancy by trained clinic staff, with body weight measured at booking appointment (≤14 weeks), again at GDM diagnosis (around 28 weeks) and at term (36-40 weeks). Additionally, age, parity, diabetes biochemistry and GDM management data were also collected.
RESULTS
RESULTS showed that 35% (n=43) of participants reported that they did receive enough information on weight management during pregnancy, and only 17.9% (n=22) could correctly identify adverse effects of gaining excessive gestational weight. Almost two thirds (61.8% n=76) did not consider weight gain a sensitive topic, and 59.3% (n=73) wanted to be informed if they were gaining excessive or inadequate weight. Accurate weight measurements were available for 85.6% (n=83) of participants during pregnancy, with mean age 31.2 (SD 4.5), mean early pregnancy BMI, 32.5kg/m2 (SD 6.7). Rate of weight gain per gestational week was calculated using IOM guidance [5] and stratified according to BMI categories: healthy weight (n=11) 0.57kg/wk, overweight (n=16) 0.47 kg/wk, and obese (n=56) 0.27 kg/wk. These preliminary RESULTS show that, healthy weight and overweight women exceeded IOM recommendations by 0.07 and 0.14 kg/wk respectively, whilst those in the obese category remained within the recommended range (0.17-0.27kg/wk).
CONCLUSIONS
In summary, women with GDM reported lacking awareness of the risks of excessive weight gain during pregnancy and would welcome further information. Recommendations for weight gain in high-risk women with GDM are urgently required within the UK to reduce the short and long terms health risks for all women.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_421

CURRENT PRACTICES AND CHALLENGES OF DIETARY SUPPORT IN JAPANESE NURSERY SCHOOLS: A QUALITATIVE STUDY OF PARENTS' NEEDS AND NURSERY TEACHERS' PERSPECTIVES

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BACKGROUND AND OBJECTIVES
It is unclear whether dietary support in nursery schools addresses the dietary concerns faced by parents of preschool children. This study aimed to clarify the current practices and challenges of dietary support in order to determine ideal activities that meet both the needs of parents and the capabilities of nursery teachers.
METHODS
Focus group interviews with parents (4 groups, n=16) and nursery teachers (2 groups, n=10, stratified by duration of work experience) were conducted in October 2024. Interviews were recorded, transcribed verbatim, and analyzed using qualitative content analysis. Codes, subcategories (in quotes), and categories were identified from the verbatim transcripts independently for each group. The two groups were then combined, **frameworks (in bold)** were created for individual categories, and subcategories were compared for similarities and differences.
RESULTS
In the comparison of **Concerns perceived at the scenes of child's eating**, "Picky eating" was extracted from both parents and nursery teachers, but "Taking too much time to eat" was extracted only from the parent group. In the comparison of **Reactions and perceptions related to specific dietary support activities**, both groups agreed that "Cooking experience during childcare" was beneficial for children. In the comparison of **Parents' desired dietary support and feasibility assessed by nursery teachers**, "Cultivation activities" was desired by parents, but nursery teachers found this difficult to implement.
CONCLUSIONS
This study revealed that parents and nursery teachers shared some concerns about children's eating, but that gaps exist between what parents desire and what teachers can feasibly provide. The findings highlight challenges in implementing dietary support and offer insights that would contribute to the development of effective dietary support in nursery schools.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_422

ERYTHROCYTE LEVELS OF N-3 POLYUNSATURATED FATTY ACIDS, AS A MARKER FOR INCIDENCE OF FRAILTY AFTER A 6-YEAR FOLLOW-UP: THE KOREAN FRAILTY AND AGING COHORT STUDY

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BACKGROUND AND OBJECTIVES
Previous studies have shown that the blood levels of n-3 polyunsaturated fatty acids (PUFA) are inversely associated with the prevalence of frailty, but associations with frailty incidence remain unknown. We examined the hypothesis that the erythrocyte levels of n-3 PUFA such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are inversely associated with the incidence of frailty after a 6-year follow-up.
METHODS
Using the Korean Frailty and Aging Cohort Study data, 1119 community-dwelling Korean participants aged 70-84 years without frailty were observed for 6 years. Frailty was defined using the Cardiovascular Health Study index.
RESULTS
In the multivariable adjusted model, the incidence of frailty was 11.1% after a 6-year follow-up and inversely associated with the Omega-3 Index (HR: 0.47; 95% CI: 0.27-0.84; *P* for trend = 0.005), and DHA levels (HR: 0.36; 95% CI: 0.19-0.68; *P* for trend = 0.003). Regarding frailty components, the incidence of low physical activity, slow walking speed, and weight loss were inversely associated with the Omega-3 Index and DHA levels. The Omega-3 Index (*P* = 0.043) and DHA levels (*P* = 0.019) differed significantly among the frailty transition groups (persistence, reversal, and deterioration). All-cause mortality was inversely associated with the Omega-3 Index (*P* = 0.011), and EPA (*P* = 0.012) and DHA levels (*P* = 0.032).
CONCLUSIONS
The incidence of frailty was inversely associated with the Omega-3 Index and erythrocyte DHA levels, suggesting that interventions with n-3 PUFA are beneficial for preventing the progression of frailty and mortality among community-dwelling older adults in Korea.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_423

DEVELOPMENT OF AHEI AND DASH USING FAOSTAT AND ITS ASSOCIATION WITH CANCER MORTALITY

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BACKGROUND AND OBJECTIVES
The Traditional Japanese Dietary Score (TJDS) has been created and reportedusing open data to examine associations with health indicators and theenvironment We newly developed AHEI and DASH and examined for associationwith cancer mortality. The purpose of this study is to clarify the associationbetween these dietary scores and cancer mortality.
METHODS
TJDS was calculated using previously published methods, DASH was calculated byFung et al. and AHEI by a modification of the method of Miller et al. Food and totalenergy supply were from the Food and Agriculture Organization of the UnitedNations database, and other data including covariates (salt intake, GDP, agingrate, years of education, smoking rate and obesity rate) were from the GlobalBurden of Disease 2021 or World Bank's databases. At first, correlations wereobtained for each score in 2010. Data from 2010 to 2021 were analyzedlongitudinally in a linear mixed model for 145 countries with populations of 1 millionor more, with each score as the independent variable and cancer mortality as thedependent variable, adjusted for all covariates.
RESULTS
Correlations between scores were TJDS and AHEI ($r=0.42$, $p<0.001$), TJDS andDASH ($r=0.19$, $p<0.05$), and AHEI and DASH ($r=0.65$. $p<0.001$). The fixed effects(SE) of the TJDS, AHEI, or DASH and cancer mortality were TJDS -2.791 (0.901, $P<0.01$), AHEI -0.741 (0.334, $P<0.05$) and DASH -2.302 (0.664, $p<0.001$).
CONCLUSIONS
Similar to TJDS, healthy dietary patterns of AHEI and DASH may also reducecancer mortality using open data.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_424

BARRIERS AND FACILITATORS TO ADOLESCENT MOTHERS ACCESSING QUALITY CARE IN THE MANAGEMENT OF SMALL AND NUTRITIONALLY AT-RISK INFANTS

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BACKGROUND AND OBJECTIVES
Adolescent childbearing is a known risk factor for health and nutrition complications for both the mother and her infant. Recognizing the increased health and nutrition risks that these mothers and their children face, being an adolescent mother is an automatic enrolment criterion into the Management of small and nutritionally at-risk infants <6 months and their mothers (MAMI) Care Pathway. The MAMI Care Pathway aims to enable infants <6 months to survive and thrive through increased identification of small and nutritionally at-risk infants <6 months and their mothers and strengthening the quality and availability of services for them. To better understand the barriers and facilitators to accessing quality health and nutrition services for adolescent mothers 15-19 years and their <6 months infants along the MAMI Care Pathway in Borno state, Nigeria, a formative research study was conducted.
METHODS
Using a combination of purposive and snowball sampling, a total of 146 study participants were selected, including: pregnant adolescents, adolescent mothers with an <6 month infant enrolled in MAMI, adolescent mothers with an <6 month infant not enrolled in MAMI, male partners of adolescent mothers, older female relatives of adolescent mothers, community health workers, and health facility-based providers. Data was collected via focus group discussions, in-depth interviews, and key informant interviews then transcribed, translated to English, and analyzed using a thematic framework analysis and Atlas.ti software.
RESULTS
Key barriers include: stigma against adolescent pregnancy; financial cost of health services and/or transportation; judgmental and/or poor quality care; lack of privacy during services; influence of family/community members; high level of trust in traditional birth attendants (TBAs); and lack of decision-making within her marriage. Key facilitators include: family, male partner, and/or community support; desire to keep herself and her baby healthy; close proximity to the health service point; low/no financial cost; hearing positive experiences from community members about services; and quality, non-judgmental medical care.
CONCLUSIONS
CONCLUSIONS
Recommendations include: train health workers on adolescent-inclusive care; initiate an adolescent mentorship program; integrate content into father-to-father support groups to support shared decision-making between husbands and wives; build linkages between TBAs and MAMI; include messaging in mother support groups on recommended health/nutrition contact points for her and her baby; and strengthen community awareness of MAMI.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_425

ACCULTURATION AND ULTRA-PROCESSED FOOD INTAKE AMONG HISPANIC ADULTS IN THE US: A SECONDARY ANALYSIS OF NHANES 2001-2018

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BACKGROUND AND OBJECTIVES
Hispanics in the United States (US) face many diet-related health disparities. Acculturation, the process by which migrants adopt cultural practices in a new country while maintaining aspects of their original culture, is associated with reduced diet quality. In the US, intake of ultra-processed foods (UPFs) has risen in past decades. UPFs, industrial formulations of chemically modified ingredients, typically high in sodium, added sugars, and saturated fats, are associated with chronic diseases. How acculturation relates to UPF intake among Hispanics remains unaddressed. This study aims to investigate how acculturation relates to UPF consumption and whether this relationship varies by sociodemographic characteristics.
METHODS
We used nationally representative, cross-sectional data from the National Health and Nutrition Examination Survey (NHANES), between 2001 and 2018 collected via two 24-hour dietary recalls (n=9,329). Latent Class analysis (LCA) classified acculturation levels, using two variables: proportion of life in the US and language spoken at home. AIC, BIC, R-squared and LRTs were used to determine best number of classes. Food items were classified according to the NOVA system. Percentage of total energy was calculated using multiple linear regression analysis. Marginal means were estimated for UPF intake across acculturation classes and level of sociodemographic variables. Models were adjusted for sex, age, education, income, marital status, and ethnicity. Wald tests assessed group differences.
RESULTS
Two latent classes were identified: a) least acculturated class, represented by participants who spoke mostly Spanish and lived in the US for less than half of their life and b) most acculturated class, represented by participants who spoke mostly English and lived in the US for most of their life. The most accultured class had higher UPF intake, with a mean energy intake of 56.0% (95% CI:55.0-57.1), while the least accultured class had a mean energy intake of 46.8% (95%CI:46.0-47.7). Ethnicity and education modified the relationship between acculturation and UPF intake, with a stronger positive association between being least acculturated and UPF intake for Mexican Americans than other Hispanic adults, and for individuals with a college degree compared to those who did not graduate high school. There was no modification by sex, age, marital status, and income.
CONCLUSIONS
Increase in UPF consumption with acculturation are concerning given existing health disparities among Hispanics. Prospective studies are needed to establish temporality between acculturation and UPF intake.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_426

DEVELOPMENT OF A FRAMEWORK AND EVALUATION INDICATORS FOR ASSESSING THE EFFECTIVENESS OF MEAL MANAGEMENT SUPPORT SERVICES IN CARE FACILITIES FOR VULNERABLE POPULATIONS IN SOUTH KOREA

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BACKGROUND AND OBJECTIVES
Meals provided in care facilities for nutritionally vulnerable groups, such as children and older adults, significantly influence their nutritional and health outcomes. To address this, the Korean government established the Meal Management Support Centers in 2012 to ensure hygienically safe and nutritionally adequate meals through management and education. However, evaluation systems to assess the impact of the centers' services on beneficiaries' nutrition and health are insufficient. This study aimed to develop a framework and indicators to evaluate the effectiveness of the centers' meal management support services.
METHODS
A comprehensive review of meal service program evaluation literature, a logic model-based assessment of existing evaluation indicators, data analysis, stakeholder interviews, and feasibility testing of new indicators were conducted to design an evaluation framework.
RESULTS
Applying the existing evaluation indicators for the centers' services to a logical model revealed that most were focused on input and process indicators, with insufficient outcome indicators. Therefore, it was developed with a focus on outcome indicators, and its applicability in the field was assessed. The current indicators used to evaluate the center's support services were used as input and process indicators, with the adequacy of budget and personnel as input indicator, and the number of management visits to care facilities and educational sessions provided to care facility beneficiaries as process indicators. The short-term outcome indicators included satisfaction levels among care facility managers and guardians. The mid-term outcome indicators focused on compliance with legal requirements for food safety and provision of nutritious meals, as well as healthy dietary practice scores. The long-term outcome indicators were designed to evaluate foodborne illness rates and food allergy incidents in care facilities, increased vegetable and fruit intake and reduced sugar consumption for children, and reduced malnutrition, weight maintenance, and frailty prevention for older adults.
CONCLUSIONS
The proposed evaluation framework and indicators to assess the effectiveness of centers' meal management support services are expected to enhance the quality of meal services for nutritionally vulnerable groups.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.
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EPO5_430

DIETARY CHOLINE AND BETAINE INTAKES DURING PREGNANCY AND BIRTH WEIGHT IN A CHINESE POPULATION

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BACKGROUND AND OBJECTIVES
Few studies have focused on the relationships between maternal dietary intakes of choline and betaine during pregnancy and birth outcomes. Moreover, the effects of dietary choline and betaine intakes from different sources on fetal growth are less known. This study aimed to examine the associations of different dietary choline and betaine sources during pregnancy with birth weight and the related adverse birth outcomes.
METHODS
We used a multi-stage stratified cluster random method to recruit 7310 women in Shaanxi, Northwest China. Maternal dietary intakes were collected by a validated FFQ and other characteristics were gathered via a standard questionnaire. We measured neonatal anthropometric values at birth. Multiple linear regression models were used to estimate birth weight changes or ORs (95% CIs) for adverse birth outcomes associated with dietary choline and betaine intakes during pregnancy.
RESULTS
The mean total dietary choline intake was 321.2 (SD 159.6) mg/d, with 41.2% from animal choline and 58.8% from plant choline. The mean total dietary betaine intake was 49.9 (SD 51.6) mg/d, with 5.8% from animal betaine and 94.2% from plant betaine. Per 100 g increases in total choline and animal choline were associated with birth weight increases of 11.0 g (95% CI 0.4–21.6), and 26.8 g (5.2–48.4), respectively. The highest tertile of total choline intake compared with the lowest tertile was negatively associated with low birth weight (LBW) (OR 0.53; 95 % CI 0.33, 0.86) and small for gestational age (SGA) (OR 0.76; 95 % CI 0.60, 0.98). Per 100 g increase in total choline was associated with lower risks of LBW (OR 0.85; 95 % CI 0.74, 0.98) and SGA (OR 0.91; 95 % CI 0.84, 0.98). The highest tertile of animal choline intake compared with the lowest tertile was negatively associated with LBW (OR 0.63; 95 % CI 0.40, 0.98) and SGA (OR 0.81; 95 % CI 0.67, 0.98). Per 100 g increase in animal choline was associated with lower risks of LBW (OR 0.74; 95 % CI 0.56, 0.97) and SGA (OR 0.90; 95 % CI 0.83, 0.97). We observed no associations of plant choline and different dietary betaine sources with birth weight, LBW, or SGA.
CONCLUSIONS
Our findings suggest that higher choline intake during pregnancy, in particular animal choline, is associated with higher birth weight and lower risks of LBW and SGA.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_431

INVESTIGATION OF THE FACTORS THAT PROLONG WEIGHT GAIN DURING WINTER

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BACKGROUND AND OBJECTIVES
Excess weight and subsequent obesity caused by irregular eating habits are associated with various diseases. The symptoms are known as "holiday weight gain", and are said to occur particularly in winter (Schoeller, 2014). In a systematic review of winter holiday eating and obesity, most participants reported experiencing weight fluctuations during the study period, particularly during winter (Abdulan et al., 2023). In Japan, there is a pattern of weight gain in winter that may lead to long-term increases in BMI. Here, we investigated the participants' holiday weight gain, dietary patterns, food preferences, and lifestyle habits to elucidate the factors that lead to long-term winter weight gain.
METHODS
After explaining the purpose of the study, we asked the participants to complete a self-administered questionnaire. The questionnaire items included age, sex, winter weight gain, taste preferences, and lifestyle habits, including diet and sleep.
RESULTS
The participants were 141 men and 198 women. Of them, 207 (61.1%) reported experiencing holiday weight gain, with 72 men (51.1%) and 135 women (68.2%) reporting weight gain. The average weight gain for those who gained weight in winter was 2.2 ± 1.1 kg, with men gaining 2.3 ± 1.2 kg and women gaining 2.0 ± 1.1 kg. A predictive model for prolonged holiday weight gain was created by dividing the participants into two groups; those who took more than a month to lose weight and those who did not. Consequently, in men, sedentary behaviour during holidays was extracted as a predictor, with a positive predictive rate of 69.4%. In women, preference for sour foods, number of days of alcohol consumption, weekday sleep time, and holiday sleep time were extracted as predictors, with a positive predictive rate of 68.9%.
CONCLUSIONS
Even among Japanese individuals, the existence of specific holiday weight gain has been recognised. The characteristics of individuals who took a long time to return to their original weight differed between men and women. For men, it was found regardless of whether they spent their days off actively, whereas for women, their daily sleeping hours and food preferences were related. To return to one's original weight and prevent obesity during winter, it is necessary to increase physical activity and support lifestyle habits, such as sleep.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_432

THE ASSOCIATIONS OF DIETARY INTAKE AND ANEMIA-RELATED BIOMARKERS WITH PRE-PREGNANCY BODY MASS INDEX IN THE FIRST TRIMESTER OF TAIWANESE PREGNANT WOMEN

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BACKGROUND AND OBJECTIVES

Adequate maternal is essential during pregnancy, especially in the first trimester when fetal development is crucial. However, few studies have investigated the associations between nutrient intake and pre-pregnancy body mass index (BMI). Therefore, this study aims to explore the associations of nutrient intake with pre-pregnancy BMI in the first trimester of gestation.

METHODS

A cross-sectional study was carried out on 373 pregnant women in the first trimester in Taiwan. Dietary intake was assessed using a food frequency questionnaire and a 24-hour dietary recall method. Student's *t* test was utilized to investigate the associations of dietary intake and anemia-related biomarkers with pre-pregnancy BMI among the participants.

RESULTS

The mean age of study participants was 30.2 years (± 6.1). The participants' average pre-pregnancy height was 1.59 m, with a mean weight of 57.5 kg, and mean BMI was 22.5 kg/m2. Among the respondents, 15.2% or 12.9% women were classified as overweight or obese, respectively. The majority of pregnant women had attained a graduate-level education. Fat intake, in terms of g (*r*: 0.13; $p = 0.013$) or % of energy (*r*: 0.14; $p = 0.009$), was positively correlated to pre-pregnancy BMI. Supplement intake, including multivitamins/multiminerals (*r*: -0.13; $p = 0.009$), was negatively correlated with pre-pregnancy BMI. Pregnant women with abnormal serum iron levels were observed to have a higher pre-pregnancy BMI compared to those with normal serum iron levels ($p = 0.007$). Meanwhile, pregnant women with abnormal serum vitamin D levels had a lower pre-pregnancy BMI than those with normal serum vitamin D levels ($p = 0.026$).

CONCLUSIONS

Pregnant women with higher pre-pregnancy BMI had significantly greater fat intake. Abnormal serum iron or vitamin D levels were also associated with higher or lower pre-pregnancy BMI, respectively.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_433

ENERGY INTAKE AND BODY FAT OF ADOLESCENT GIRLS: A PILOT STUDY

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BACKGROUND AND OBJECTIVES
The adolescent stage is critical for disrupting the cycle of malnutrition, yet poor dietary intake remains a major issue (1). Adolescent girls globally suffer from both micro and macro- nutrient malnutrition, affecting their health and wellbeing (2). Poor nutrition predisposes adolescents to stunted growth, excess body fat and chronic diseases (3). This pilot study assessed the energy intake and body fat of adolescent girls.
METHODS
A school-based pilot study was conducted using purposive sampling to collect data from 40 adolescent girls aged 10-19 years. Dietary data (24-hour recall) for three days was determined using the International Dietary Data Expansion Project Application (INDDEX 24 App). Body fat was measured with an Omron Body Composition Monitor and Scale (BF-511). Data were analysed with IBM SPSS Statistics version 25. Pearson correlation (r) was used to determine the relationship between dietary intake and percentage body fat.
RESULTS
More than half (52.5%) of the adolescent girls were in the late adolescent period (15-19 years). Energy intake averaged 2208.44 kcal/day, with 37.5% not meeting recommended values. Over 90% of the participants fell within the recommended carbohydrate range, with about 70% having protein intake (primarily plant-based) above the minimum intake level. Fat intake was within the Acceptable Macronutrient Distribution Range (AMDR) for 55% of the adolescent girls, and saturated fat intake aligned with WHO recommendations. Carbohydrate, protein and fat contributed 54%, 10% and 36%, respectively to total calorie intake. Body fat was normal for 60%, while 25% were overfat/obese. No significant correlations were found between energy intake and body fat percentage ($p > 0.05$).
CONCLUSIONS
The study highlights high carbohydrate intake, moderate protein from plant sources, and high fat intake for most of the girls. Promoting balanced diets with diversified protein sources and moderate carbohydrate and fat consumption is crucial for improving adolescent health.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_434

HOUSEHOLD FOOD SAFETY AND HYGIENE PRACTICES IN AFRICA: KEY DETERMINANTS AND INFLUENCING FACTORS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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BACKGROUND AND OBJECTIVES
Food safety and hygiene practices are critical components of public health, particularly in Africa, where foodborne illnesses pose significant health risk. Despite the importance of proper food handling and sanitation practices, there is a lack of compressive data on household food safety practices across the continent. Various socio-economic, cultural, and environmental factors may influence these practices, yet the interplay between these determinants is still unclear. Thus, this systematic review aimed to analyze the key determinants and influencing factors of household food safety and hygiene practices in Africa.
METHODS
Comprehensive literature searches were performed using PubMed, Embase, African Journals Online, and ScienceDirect databases. Furthermore, Google Scholar and citations from other studies were also incorporated. We conducted our search using a combination of keywords and medical subject-heading terms linked to the study title. The study aimed to estimate household food safety and hygiene practices while also finding the key determinants and influencing factors. Two reviewers extracted data from the studies included using Excel**.** Stata version 17.0 was used to perform the meta-analysis using a random effect model.
RESULTS
In total, 33,713 published and unpublished research records were retrieved. From this, 17 studies were included for systematic review, and 7 studies were included in the meta-analysis. The prevalence of good food hygiene practice in households ranges from 17.6% to 60.0%, and major influence factors include disease awareness, availability of latrines, handwashing facilities, liquid waste disposal pits, and workload. A total of 53% (95% CI, 43%–64%) of the households included in the meta-analysis had good food safety practices. Good knowledge and a positive attitude towards food safety were key factors that enhanced food safety practices.
CONCLUSIONS
In this review, half of the households from seven African countries that took part in the studies were not practicing proper food hygiene and safety. Key influence factors for food hygiene practices include disease awareness, access to sanitation facilities, and workload, while good knowledge and positive attitudes towards food safety were crucial for improving the food safety practices of households in Africa.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_435

INSIGHTS RELATING TO HETEROGENOUS INNATE IMMUNE TRAINING IN MONOCYTES FROM OLDER INDIVIDUALS

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BACKGROUND AND OBJECTIVES

Monocytes and macrophages are key players in innate immune training (IIT), a form of immunological memory of innate immune cells. Dietary ingredients, including yeast β-glucan, can induce IIT, improving immune function. Nevertheless, IIT capacity has not been determined in older cohorts at risk of malnutrition that may benefit from immune training. Understanding this could lead to therapies enhancing IIT. The aim of this study is to examine IIT capability in monocytes from older individuals.

METHODS

Monocytes from 60 individuals over 65 were isolated and macrophage selected. IIT was tested by exposing cells to yeast β-glucan (stimulus 1) one-day post-isolation and LPS (stimulus 2) after a 4-day rest to return cells to a non-activated state. TNF-α, IL-6, and IL-10 were measured post-LPS stimulation, a ≥10% increase in cytokine response to LPS in cells pre-treated with β-glucan was classified as IIT.

RESULTS

Heterogeneous training responses were observed, with 45% and 41% of the cohort displaying TNF-α and IL-6 training responses, respectively. Training responses varied among individuals, and a significant inverse relationship with BMI & training was observed. Monocytes with higher baseline cytokine responses to LPS alone demonstrated lower training responses.

CONCLUSIONS

This study is the first to demonstrate that IIT of monocytes by β-glucan can be induced in a large proportion of subjects in an elderly cohort. Increasing BMI was associated with a lower training response, further analysis will focus on the impact of other phenotypic factors within this cohort on training.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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ASSOCIATION BETWEEN FREQUENCY OF CONSUMPTION OF DAIRY PRODUCTS AND SEVERITY OF DEPRESSION SYMPTOMS AMONG UNIVERSITY STUDENTS

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BACKGROUND AND OBJECTIVES
Some studies suggest that consumption of dairy products may help maintain mental health and potentially reduce the risk of developing depression. The aim of this study was to assess an association between consumption frequency of dairy products and severity of depression symptoms among university students.
METHODS
The cross-sectional study was conducted among 304 Polish university students aged 18-26 years (74% females). Severity of depression symptoms was assessed with a subscale of the Depression Anxiety Stress Scale (DASS-21) including 7 items, and evaluated in 3 categories: normal (0-4 points; reference group), mild/moderate (5-10 points), severe (11-21 points). Dietary data were collected with the validated 72-item semi-quantitative food frequency questionnaire (72-item SQ-FFQ), including 5 items regarding dairy products (e.g., milk and natural milk beverages, cheese). Consumption of dairy products at least 2 times/day was considered as in line with dietary recommendations. Association between analysed variables was assessed using Spearman's correlation coefficient and logistic regression analysis. Odds ratios (ORs) were adjusted for sex and age.
RESULTS
Depression symptoms were mild/moderate in 37.4% and severe in 31.1% of the university students. Less than half of the university students (42.4%) consumed dairy products at least 2 times/day. Significant negative correlation of consumption frequency of dairy products with depression symptoms among university students was found ($r = -0.12$, $p = 0.038$). Students who met the recommend consumption frequency of dairy products were significantly less likely to have depression symptoms at a mild/moderate level (OR = 0.57, 95% CI = 0.33-0.99) or a severe level (OR = 0.47, 95% CI = 0.26-0.85) compared to those who consumed dairy products less than 2 times a day.
CONCLUSIONS
Consumption of dairy products at the recommended level (at least 2 times/day) was negatively associated with severity of depressive symptoms among Polish university students. Adequate dairy consumption can promote better mental health among students.

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CONFLICTS OF INTERESTS
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EPO5_439

ASSOCIATION BETWEEN MINDFUL EATING AND DIETARY PATTERNS AMONG UNIVERSITY STUDENTS

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BACKGROUND AND OBJECTIVES
Mindful eating is maintaining an in-the-moment awareness of the food consumed and can promote healthy food choices and better diet quality. The aim of this study was to assess an association between mindful eating and dietary patterns among university students.
METHODS
The cross-sectional study was conducted among 304 Polish university students aged 18-26 years (74% females). Mindful eating was assessed with the Mindful Eating Scale (MES) including 28 items. MES score was evaluated as the average of all item scores and analysed using two levels: low (<3 points; reference group), higher (3-4 points). Dietary data were collected with the validated 72-item semi-quantitative food frequency questionnaire (72-item SQ-FFQ). Three dietary patterns (DPs) were derived using Principal Component Analysis (PCA): Prudent, Western, Traditional, and analysed in tertiles. Association between analysed variables was assessed using Spearman's correlation coefficient and logistic regression analysis. ORs were adjusted for sex, age, and BMI.
RESULTS
The higher level of mindful eating had 49.3% of the university students. Mindful eating score was positively correlated with Prudent DP ($r = 0.20$, $p < 0.001$), and negatively correlated with Western DP ($r = -0.24$, $p < 0.001$) and Traditional DP ($r = -0.12$, $p = 0.039$). Students with the higher level of mindful eating were significantly more likely to adhere to Prudent DP (middle tertile: OR = 2.34, 95% CI = 1.29-4.27; upper tertile: OR = 2.38, 95% CI = 1.30-4.36), and significantly less likely to adhere to Western DP (upper tertile: OR = 0.30, 95% CI = 0.16-0.55) compared to those with the low level of mindful eating. Students with the higher level of mindful eating were also less likely to adhere to Traditional DP, but this association was not significant (upper tertile: OR = 0.60, 95% CI = 0.33-1.08).
CONCLUSIONS
Mindful eating was positively associated with pro-healthy dietary pattern, and negatively associated with less healthy dietary patterns among university students. Mindful eating can promote healthier dietary behaviours among students.

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EPO5_440

DETERMINANTS OF HEALTHY WEIGHT IN TEENAGERS: A WHOLE SYSTEMS APPROACH

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BACKGROUND AND OBJECTIVES
Over a third (37%) of children aged 10-11 years, and 64% of adults in England are overweight or obese(1), indicating a steep increase during adolescence. The UK Government's Child Obesity Plan outlines strategies to address obesity in younger children but provision for the adolescent population is limited, reflecting the challenges of addressing healthy weight in this age-group. The Whole Systems Approach to Obesity (WSA)(2) is a multi-faceted approach, comprising six phases, which engages with the many determinants of healthy weight, and draws on the strengths of key community stakeholders. Following WSA phases 1-4, this study aimed to identify the factors influencing healthy weight in 13-17 year-olds in Surrey (UK), to inform a targeted local strategy.
METHODS
An online survey was distributed to those working with young people in Surrey, exploring perceived barriers and facilitators to making healthy choices in five areas: healthy eating, physical activity, weight management, mental health and wellbeing. Focus groups conducted amongst young people recruited locally explored similar areas. Causal maps were created using outputs from the survey and focus groups to enable visualisation of the underlying network of causes and effect, to identify common themes, and highlight interactions between them.
RESULTS
The survey (n=35) showed lower confidence and lack of training amongst those working with young people, in discussing the issue of healthy weight compared to other topics. The influence of role models, teachers, food environment, and peer pressure were identified by young people (n=27) as key determinants of food and activity choices. Key priority areas for action emerged from the causal mapping: supporting positive role models, including parents, teachers, youth workers and social media; improving the food environment in and outside of school; mental health support, and incorporating food and health in all local government policies, including providing safe, affordable exercise spaces. These priorities are being used locally to identify existing areas of provision that could be focussed on the needs of young people, and areas for additional input.
CONCLUSIONS
A WSA, with causal mapping, enables the multifactorial and complex macro and micro influences impacting young people (and their interactions) to be explored in depth, and priorities for action to be set which are likely to have the greatest impact on this hard-to-reach population group.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_441

BREAST MILK INTAKE OF KENYAN INFANTS PARTICIPATING IN COMPLEMENTARY FEEDING INTERVENTION

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BACKGROUND AND OBJECTIVES
Human milk is uniquely tailored to the individual child and is packed with nutrients and bioactive components promoting health, growth and development well beyond 6 months of age. The transition to complementary feeding (CF) in food-insecure settings is a critical period that significantly influences a child's risk of developing malnutrition. As studies progress towards finding sustainable and optimized complementary foods to help prevent the burden of undernutrition in vulnerable communities, care must be taken to not displace breastfeeding and the essential components it provides.
The main objective was to examine the impact on the human breast milk intake (HMI) in infants participating in a CF intervention. Secondary objectives explored HMI associations with growth and demographic and socioeconomic factors.
METHODS
Nested within the larger HEALTHYNSECT intervention, a sub-sample of sixty mother-infant dyads were assessed for HMI using Deuterium Dose-to-mother (DDTM) isotope technique. Dosed deuterium dilution in mother and child was measured in saliva samples over 14 days and quantified by Fourier Transform Infrared Spectroscopy (FTIR). Demographic and socioeconomic factors were assessed by interview-administered questionnaires.
RESULTS
The intervention exposures did not vary in impact on HMI amongst the on average 6.9±0.6 month old infants. The mean HMI was 783±211 g/day, providing on average 90±22% of the energy requirement. High HMI was observed irrespective of the intervention arm, indicating that the CF intervention did not displace breast milk. We found a positive association (P<0.05) between HMI and weight-for-length Z-score (WHZ) and a trend of a positive association, with length-for-age Z-score (HAZ) (P<0.10). Additional significant associates of HMI included maternal age and the number of antenatal clinic (ANC) visits during pregnancy.
CONCLUSIONS
Providing high-quality CFs did not displace breastfeeding. This study adds to the understanding of the association of breast milk intake volumes with growth and nutritional status amongst infants. Promoting continued breastfeeding and access to antenatal care in food insecure settings are keys to the prevention of undernutrition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_442

CO-CREATING PRACTICAL TOOLS FOR GENDER TRANSFORMATIVE NUTRITION: BRIDGING GAPS IN PUBLIC HEALTH APPROACHES ACROSS THE LIFE CYCLE

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BACKGROUND AND OBJECTIVES
Gender inequalities influence nutrition outcomes across the life cycle, yet practical approaches to integrating gender into nutrition programs and policies remain underdeveloped. This participatory research project aimed to co-create tools that bridge this gap, enabling nutrition professionals to effectively address gender dimensions in their work. We developed our tools based on the Gender Transformative Framework for Nutrition (GTFN), an evidence-based model designed to help nutrition programs address gender inequalities. The GTFN highlights how gender norms, institutions and power dynamics limit women's and girls' access rates and identifies opportunities to tackle the social complexities of malnutrition.
METHODS
A co-creative, participatory approach was applied, engaging stakeholders from diverse contexts, in iterative consultations. A landscaping analysis, needs assessment, and stakeholder-led task forces provided the foundation. This process sought to integrate gender-transformative action with public health nutrition principles to ensure relevance and usability. Stakeholder feedback informed the tools' design, content, and application, ensuring local alignment.
RESULTS
The project produced three practical tools tailored for professionals to integrate gender in their life cycle approaches [and beyond] to nutrition: 1) a tool that utilizes the GTFN to take a systems-based thinking approach to problem definition, 2) a tool based on the GTFN that offers practical guidance for establishing organizational practices to implement gender-transformative programs and 3) a guidance note focused on advocating for gender-transformative nutrition approaches. Two supplementary briefing notes are also drafted to guide the integration of intersectionality into nutrition programs and policies. All resources were refined through user testing and are freely available.
CONCLUSIONS
These tools demonstrate that integrating gender into nutrition is feasible & essential for achieving equitable health outcomes across the entirety of the life cycle. The project addresses the pressing need for practical and actionable gender transformative resources. This presentation will highlight the tools' application and invite dialogue with practitioners who may not yet consider gender in their work; emphasizing the utility in creating impactful & inclusive nutrition strategies, and in program development & implementation.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_443

A STUDY ON THE CONTRIBUTION OF NURSERY SCHOOL LUNCHES TO CHILDREN'S DIETS IN JAPAN

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BACKGROUND AND OBJECTIVES
In Japanese nursery schools, meals are systematically prepared by dietitians. However, virtually no detailed studies have examined the actual contribution of nursery school lunch to children’s diet. The purpose of this study was to evaluate the current contribution of nursery school lunch to the diet of children attending nursery schools in Japan.
METHODS
This study included 778 children (435 boys and 343 girls, totaling 1,556 person-days), aged 3–6 years, from nursery schools in seven cities in Japan. Food records were collected on two nonconsecutive weekdays in 2019 and 2020 by using food record methods. Meals were classified into four categories: breakfast, lunch, dinner, and snacks, with lunch provided at the nursery schools. We estimated the usual intake, based on the nutrient intake from two weekdays. We calculated the lunch contribution rate for each child as the lunch intake divided by total intake and determined the mean values, based on sex.
RESULTS
The mean total energy intake on weekdays was 1,476 ± 169 kcal for boys and 1,367 kcal for girls. The energy of lunch was 402 ± 67 kcal for boys and 382 ± 60 kcal for girls, with lunch contribution rates of 27.6% and 28.4%, respectively. Nutrients with less than 20% contribution from lunch were calcium and saturated fatty acids. Nutrients with more than 30% contribution included protein, dietary fiber, vitamin A, thiamine, vitamin C, potassium, magnesium, iron, zinc, and copper.
CONCLUSIONS
This study is the first to comprehensively examine the contribution of nursery school lunches to children’s dietary intake across multiple regions in Japan. The findings indicated that children attending nursery schools consumed more than 30% of their total intake of vitamins and minerals from lunch on weekdays. Furthermore, the nursery school lunches provided a diet low in saturated fatty acids, the intake of which should be restricted, suggesting that lunches may be designed to provide desirable nutrient intake for children. The low calcium contribution rate was likely because milk, a primary calcium source, was provided as a post-lunch snack and thus not included in the lunch contribution rate. Future research should evaluate the contribution rate, including snacks provided by nursery schools, and assess nutrient intake at nursery schools using dietary reference intake for Japanese.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_444

ASSOCIATION BETWEEN HEALTH LITERACY AND DIETARY HABITS/INTEREST IN FOOD INFORMATION AMONG YOUNG WOMEN

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BACKGROUND AND OBJECTIVES
In Japan, approximately 19.1% of young women have a BMI < 18.5, raising concerns about nutritional deficiencies and hormonal imbalances. "Normal weight obesity," characterized by normal BMI but high body fat percentage, is an emerging issue. The proliferation of health information through social media has improved accessibility and spread misinformation. “Health literacy," defined by WHO as the ability to access, understand, and utilize health-related information, is critical for maintaining health. This study examined relationships between health literacy, body type, lifestyle habits, dietary habits, and mental health among young Japanese women to identify factors promoting healthier lifestyles.
METHODS
A cross-sectional survey was conducted with 261 female university students at O University in Tokyo in 2023 and 2024. Health literacy was assessed using the CCHL scale, with the average score calculated from five items. Dietary habits were evaluated using 28 items on a four-point scale, while interest in food information was assessed with 13 items indicating interest. Body composition was measured using InBody770, and participants were classified into four groups: underweight, expected weight, normal weight obesity, and overweight. Chi-square tests analyzed associations between health literacy and factors. Binomial logistic regression was conducted with CCHL scores (≤3.2 vs. >3.2) as the dependent variable and depressive tendencies, dietary habits, and interest in food information as variables.
RESULTS
Quartile analysis CCHL showed no significant differences in body type or depressive tendencies. However, significant differences were observed in dietary habits, with the low health literacy group reporting lower frequencies of considering nutritional balance and consuming a diverse range of foods at least five times weekly ($p < 0.01$). The low health literacy group also showed less interest in "nutrition" and "food culture" ($p < 0.05$). Multivariate analysis revealed a significant association between higher CCHL scores and interest in food culture (OR: 0.40, 95% CI: 0.17–0.97).
CONCLUSIONS
Health literacy was not directly associated with body type or depressive tendencies but influenced dietary habits and interest in food information. Participants with low health literacy demonstrated reduced awareness of nutritional balance and dietary diversity and lower engagement with food culture. These findings underscore the importance of health literacy education in fostering improved health behaviors, greater interest in nutrition, and promoting healthier lifestyles.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_447

FOOD LITERACY AMONG JAPANESE JUNIOR HIGH SCHOOL STUDENTS

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BACKGROUND AND OBJECTIVES

In Japan, the *Shokuiku* (Food Education) Basic Act was enacted in 2005, and the government has promoted *Shokuiku* as an essential education for all generations. Our school lunch system and Home Economics class has played a key role in *Shokuiku* at school. We are currently facing not only health problems but also societal issues such as food waste and poor self-sufficiency. The concept of food literacy has become more important to practice healthy and sustainable eating around the world. The objective of our research is to assess students' food literacy in order to develop effective methods for food education at school.

METHODS

We developed an original questionnaire on food literacy which contained 34 items to assess a wide range of the attitudes, knowledge, skills and behaviors associated with students' dietary life. This questionnaire was distributed in Home Economics classes at two public schools in Yamagata prefecture. The answers of 187 students were analyzed using descriptive statistics. SPSS was also used for statistical analysis and significance was determined at $P < .05$.

RESULTS

More than 80% of the students in both schools answered positively about eating breakfast every day and recycling food containers. Also, most of them answered that they washed their hands before cooking and eating. However, less than 50% of them showed the positive action with regard to searching and using information for healthy eating. In addition, around 40% of the students answered that they sometimes wasted food by leaving it uneaten. As for nutritional knowledge, more than 90% of them could correctly choose rice as a good source of carbohydrates, and fruits & vegetables as a good source of vitamin C. Around half of the students could plan a healthy menu from several food items such as rice, fruits & vegetables, meat & fish and milk.

CONCLUSIONS

Our RESULTS suggest that Japanese junior high school students have positive attitudes towards eating breakfast regularly, recycling food containers and food sanitation. They understood the nutritional value of rice and fruits & vegetables. It is expected that the Japanese *Shokuiku* could have a positive effect on students' attitudes and knowledge. Furthermore, it is necessary for the students to learn how to utilize information appropriately for practicing healthy eating through food education at school.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_448

FRAMEWORKS AND LOGIC MODELS DESCRIBING CONSUMER RESPONSE TO FRONT-OF-PACK LABELLING (FOPLS): A SCOPING REVIEW

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BACKGROUND AND OBJECTIVES
The WHO defines front-of-pack nutrition labellings (FOPLs) as nutrition labelling systems displayed on the front of food packages and they provide consumers with simplified information on the nutritional content of food products(1). Hence, understanding consumer response to these FOPLs is essential(2). Few structural frameworks and logic models were created to illustrate how different domains interact in shaping consumer responses to FOPLs. Many domains were commonly explored in various ways in some of the frameworks or logic models, while partially included in others(3,4). However, the limited number of frameworks and logic models presented in the literature makes it challenging for researchers and policy makers to have a predefined structure describing the consumer response to FOPLs.
This scoping review aims to identify frameworks and logic models describing consumer response to FOPLs. Secondarily, we will specify and categorise the different domains of each framework or logic model, determine how these these were developed, analyse the commonalities and differences between them and explore citation patterns existing in the literature.
METHODS
We will conduct a scoping review of studies publishing a framework or logic model describing consumer response to FOPLs. Studies will be identified through PubMed, Embase, Scopus, Web of Science and the first ten pages of Google Scholar. We will develop the search strategy with input from the information specialist and the project team and adapted to each database. A sample of the references will be screened in duplicate for title and abstract with consensus in case of disagreement. Full texts will be then screened by two authors and disagreements will be resolved through a discussion with a third author. A standardised data extraction involving both standard and qualitative data collection will be developed and piloted. We will extract the following information: general characteristics, framework or logic model constituents and the links between them, information on how the framework or logic model was developed, data on the citation of these frameworks in existing research and data on the methods of the studies.
RESULTS
We will descriptively summarise the various elements included in the study and the frameworks or logic models. Then, we will categorise domains progressively. Finally, we will analyse the commonalities and differences between the different domains.
CONCLUSIONS
Providing a consensus framework makes it easier for researchers and policy makers to have a predefined structure describing the consumer response to FOPLs. Therefore, this may enhance the synthesis of evidence thus limiting research waste and boosting policy modifications.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_449

DAIRY INTAKE AND CHRONOTYPE IN PERI- AND POSTMENOPAUSAL WOMEN: A PRELIMINARY CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
It is known that a diet based on milk and dairy is effective in improving sleep quality. However, the association of dairy consumption with chronotype remains unknown. This study aimed to assess the association of total dairy intake and the main dairy groups with chronotype in peri- and postmenopausal women.
METHODS
This preliminary cross-sectional study involved 236 women aged 48-68 years from north-eastern Poland. Dietary data was collected using a food frequency questionnaire (62-item FFQ-6®). Data on the frequency consumption of five dairy groups: milk/fermented milk drinks, sweetened milk drinks, cheese, cheese curd, and flavored cheese curd was expressed in times per day and then summarized as total dairy consumption. The five-item Women's Health Initiative Insomnia Rating Scale (WHIIRS) was calculated (ranged 0-20 points). Based on the declared data on the time of greatest activity during the day, women were divided into two groups according to chronotype: ‘morning’ and ‘evening’. The logistic regression analysis was performed. The odds ratios (ORs) and the 95% confidence interval (95%CI) were calculated. The ORs were adjusted for age, BMI, WHIIRS, professional status, overall physical activity, using a smartphone/tablet/telephone/computer/TV before sleep, menopausal symptoms, and chronic diseases.
RESULTS
The total dairy consumption at least two times/day and milk/fermented milk drinks consumption at least once a day were associated with approx. two-times higher odds of evening chronotype occurrence compared to the morning chronotype, independently of many potential confounders (OR=1.86, 95%CI: 1.01-3.41, $p<0.05$; OR=1.90, 95%CI: 1.04-3.47, $p<0.05$, respectively). A one-time/day increment in cheese consumption increased the odds of evening chronotype occurrence, however, this association disappeared after adjustment. There were no significant associations of consumption of sweetened milk drinks, and cheese curds, including flavored with women's chronotype.
CONCLUSIONS
A higher consumption of milk and total dairy was positively associated with the evening chronotype in women from north-eastern Poland. The higher frequency consumption of milk and total dairy could result from sleep quality care by women with evening chronotype.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_450

ADHERENCE TO THE MEDITERRANEAN DIET AND CHRONOTYPE IN PERI- AND POSTMENOPAUSAL WOMEN: A PRELIMINARY CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
Available studies indicate a beneficial effect of adherence to the Mediterranean diet (MED) on sleep quality. However, the RESULTS of studies on MED and chronotype in European countries outside the Mediterranean Sea region are limited and inconclusive. This study aimed to assess the association between adherence to the Mediterranean diet expressed in the Polish-adapted Mediterranean Diet® (Polish-aMED®) score and chronotype in peri- and postmenopausal women.
METHODS
This preliminary cross-sectional study involved 236 women aged 48-68 years from north-eastern Poland. The food frequency consumption data was collected using a food frequency questionnaire (62-item FFQ-6®). The Polish-aMED® score involving 8 items: vegetables, fruit, whole grain, fish, legumes, nuts/seeds, the ratio of vegetable oils to animal fat, and red/processed meat was calculated (range: 0-8 points). The five-item Women's Health Initiative Insomnia Rating Scale (WHIIRS) was calculated (ranged 0-20 points). Based on the declared data on the time of greatest activity during the day, women were divided into two groups according to chronotype: ‘morning’ and ‘evening’. The logistic regression analysis was performed. The odds ratios (ORs) and the 95% confidence interval (95%CI) were calculated. The ORs were adjusted for age, BMI, WHIIRS, professional status, overall physical activity, using a smartphone/tablet/telephone/computer/TV before sleep, menopausal symptoms, and chronic diseases.
RESULTS
The ORs of the morning chronotype compared to the evening chronotype (OR=1.00) were approx. two-times higher for women with a higher level of adherence to the Polish-aMED® score (6-8 vs. 0-3 points, OR=2.39, 95%CI: 1.12-5.09, $p<0.05$), those who consumed fruit at least once a day (OR=1.86, 95%CI: 1.04-3.33, $p<0.05$), and had a ratio of vegetable oils to animal fat consumption at least one (OR=2.54, 95%CI: 1.15-2.59, $p<0.05$), independently of many potential confounders. Consumption of legumes and nuts/seeds at least several times/week also increased the odds of morning chronotype occurrence, however, this association disappeared after adjustment.
CONCLUSIONS
The higher adherence to the Mediterranean diet in Polish adaptation was positively associated with the morning chronotype in women from north-eastern Poland. These RESULTS may provide a basis for dietary recommendations taking into account the circadian rhythm of women living in non-Mediterranean countries.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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3. https://pubmed.ncbi.nlm.nih.gov/29641468/
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EPO5_451

ASSOCIATION BETWEEN SWEETS INTAKE AND PREMENSTRUAL SYNDROME ~ CROSS-SECTIONAL SURVEY OF JAPANESE YOUNG ADULT WOMEN ~

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BACKGROUND AND OBJECTIVES
Recent epidemiological studies of young adult women have reported relationship between sweets intake and Premenstrual Syndrome, but the RESULTS are inconsistent. Therefore, we conducted a cross-sectional survey of Japanese young adult women to examine the association between sweets and Premenstrual Syndrome.
METHODS
The subjects were 519 Japanese young adult women aged 18-29 years. Estimated sweets intake was assessed using the food frequency questionnaire FFQgVer.6, which has been validated. The presence or absence of Premenstrual Syndrome was assessed using a self-report questionnaire. The association between sweets intake and Premenstrual Syndrome was evaluated using logistic regression analysis. The statistical significance level was set at $p<0.05$.
This survey was approved by the ethics review committee of Japan Women's University (No. 499) and was carried out according to the ethics guidance on medical research for people (Ministry of education Ministry of Health, Labour and Welfare)
RESULTS
We observed a statistical significant positive association between sweets intake and Premenstrual Syndrome.
Age-adjusted OR (Q4 vs. Q1) = 2.21 (95% CI: 1.34-3.64: p=0.0023)
Multivariate-adjusted OR = 2.26 (95% CI: 1.36-3.73:0.0021)
CONCLUSIONS
Our study suggested that those with higher sweets inatake had a higher risk of Premenstrual Syndrome in Japanese young adult women.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_452

ACTIONS AND CHALLENGES OF COMMUNITY COMPREHENSIVE SUPPORT CENTERS FOR PREVENTING MALNUTRITION IN OLDER ADULTS

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BACKGROUND AND OBJECTIVES
In Japan, the number of people aged 65 years and above is 36.23 million, accounting for29.1% of the total population. By 2070, one in 2.6 people will be 65 years old and over, and one in 4.0 will be 75 years old and over. Therefore, highly individualized and complex support is required forthe older adults in the community. Japan's community comprehensive support centers areintended to provide residents with comprehensive support by offering the assistancenecessary to maintain their health and stabilize their lives. This study aimed to examine thenutritional challenges and support status of older adults in the community, as captured by these community comprehensive support centers.
METHODS
A mailed questionnaire survey regarding nutritional issues and support for older adults in thecommunity was conducted from July to August 2023 at community comprehensive supportcenters in Tokyo and Kanagawa prefectures.
RESULTS
The survey covered 840 centers, from which311 responses were obtained (response rate of 37.0%).Among the criteria for determining malnutrition, the most common criteria were thinappearance (84.6%), weight loss or rate of weight loss (79.1%), and decreased food intake(78.8%). In contrast, blood test RESULTS (40.8%), lower leg circumference (15.8%), and MNA®-SF (1.3%), which can objectively assess malnutrition, were not generally utilized. The mostcommon support methods for malnutrition were recommending visits to medical institutions(89.1%), the use of meal delivery services (83.3%), and checking for food intake (77.8%).Very few centers (6.1%) implemented the calculation of energy and nutrient intake throughmeals to ensure that the required amounts were administered. No nutrition specialists wereassigned to the community support centers, and the percentage of those who regularlycollaborated with a registered dietitian was low (12.5 %).
CONCLUSIONS
This study suggests that properassessment and specialized nutritional intervention are necessary to prevent malnutrition incommunity-dwelling older adults.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_453

IMPLEMENTING HEALTHY EATING INTERVENTIONS IN FOOD RETAILERS: STAKEHOLDER MAPPING AND ANALYSIS IN SMALL MUNICIPALITIES IN BRAZIL

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BACKGROUND AND OBJECTIVES
Excessive ultra-processed food consumption is a significant risk factor for non-communicable diseases (NCDs), such as obesity. Smaller cities face additional challenges due to limited access to healthy foods, making ultra-processed options more accessible (Cacau et al.,2024; Louzada et al.,2015). Engaging stakeholders is, therefore, crucial to driving food policy changes and supporting interventions. This study aims to map and analyze stakeholders for interventions in small Brazilian food retailers to promote healthier food choices.
METHODS
We used a mixed-methods approach, selecting seven municipalities in the São Paulo State, Brazil based on demographic, socioeconomic, and nutritional status criteria. Stakeholders were mapped through searches on government websites, municipal administrations, Google Maps, and data from previous field visits. Stakeholder analysis followed a structured plan covering stages of identification, data collection, and categorization (public, private, hybrid, or third-sector actors). We also applied Mendizabal's Alignment, Interest, and Influence Matrix (AIIM) to identify stakeholders with higher levels of influence and alignment with the development of an intervention in small Brazilian food retailers to promote healthier food choices (Hollmann et al.,2022; Lacy-Nichols et al.,2023; Mendizabal,2010).
RESULTS
An initial search mapped 62 municipal actors across the seven municipalities included in the study. Exploratory in-person visits and virtual meetings identified additional actors, totaling 93, including public entities (52.7%), third sector (19.3%), hybrid (17.2%), and private entities(10.8%). The AIIM indicated that actors with the highest alignment and interest scores were the Health Secretariats and the Ministry of Health while opposing actors included local commercial and industrial associations.
CONCLUSIONS
The mapping and analysis of stakeholders across seven municipalities will support the development and execution of an engagement plan. The involvement of local actors is key to reducing barriers to intervention. Key actors, such as Health Secretariats and the Ministry of Health, were identified as crucial for the potential scalability and sustainability of the food retail interventions, including the implementation of food environment policies on a national scale.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_455

DIETARY PATTERNS AND THE RISK OF EATING DISORDERS AMONG HEALTH SCIENCE STUDENTS IN A TERTIARY INSTITUTION IN GHANA

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BACKGROUND AND OBJECTIVES
Health is a comprehensive term encompassing physical, mental and social well-being. Often, people lose sight of this holistic approach, emphasizing only on the physical aspect. Adjustments to new environments, changes in the food environment, coupled with stressful studying schedules are common features associated with university students. Hence, the need to assess dietary pattern and risk of eating disorders among this population to ensure adequate measures are put in place to deal with such problems should they exist. Thus, the study sought to determine whether there was an association between dietary pattern and risk of eating disorder among these students.
METHODS
It was a descriptive cross-sectional study among 200 health science students randomly selected from the college of health sciences campus of the University. Food frequency questionnaires were administered to assess participants' frequency of intakes. Principal component analysis was used to determine dietary patterns from frequency of intakes. The validated Eating Attitudes Test - 26 (EAT- 26) questionnaire was used to assess their risk of eating disorders. Statistical Package for Social Sciences (SPSS) version 26 was used for data analysis.
RESULTS
Most (54.9%) participants were females. Participants' age ranged between 18 – 27 years. About a sixth (14.6%) of participants were at risk of eating disorders. Two major dietary patterns were identified, nutrient dense pattern and convenience dietary patterns. Nutrient-dense dietary pattern accounted for the largest variance in the food consumption data. It consisted of legumes and nuts, vegetables, oils, and oily foods. There was no significant association between the convenience and nutrient - dense dietary patterns and the risk of eating disorders ($p=0.568$ & $p=0.433$ respectively)
CONCLUSIONS
There was a low risk of eating disorders among the health science students and there was no association between the dietary patterns and the risk of eating disorders. Nevertheless, continuous nutrition education is still needed among this population to prevent eating disorders and its associated health implications
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_456

ASSOCIATION BETWEEN ANTHROPOMETRIC INDICES AND DIETARY PATTERNS OF OLDER ADULTS WITH PERIODONTAL DISEASE; A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
Periodontal disease (PD) affects about 743 million people globally and is a growing public issue. It reduces the quality of life of older adults and is a major cause of tooth loss. However, the association between dietary patterns and anthropometric indices among older adults with PD is not clear. Hence, the critical need to investigate these interactions of public health concern.
METHODS
Socio-demographic information and dietary data were obtained using a structured questionnaire, and a validated qualitative food frequency questionnaire respectively. Height was measured by a stadiometer and a bioelectric impedance analyzer used to measure weight, body mass index, body fat, visceral fat, and muscle mass. Dietary patterns were determined using Principal Component Analysis (PCA). Pearson's correlation and an independent T-test were used to determine the relationships at statistical significance level of $p \leq 0.05$.
RESULTS
Nine dietary patterns were identified using the frequency of dietary intakes out of the 57 food items investigated. Cereals and grains were mostly consumed (31.4%) with majority (23%) being males. Similarly, vegetables (47.5%), legumes and nuts (56.9%), animal and animal products (37.3%) and high sugary foods (75.5%) were consumed on a weekly basis. The dietary Pattern of participants was more of the “Sweets and Alcoholic Beverages”. A weak positive relationship (r=.283, p=0.000) between muscle mass and “sweets and alcoholic beverages patterns” was established, and a weak negative association (r=-.188, p=0.007) between body fat and “shellfish dietary pattern”. “The shellfish dietary pattern” had a weak positive association (r=.205, p=0.003) with muscle mass. “High Protein dietary Pattern” had a weak negative association (r=-.171, p=0.014) with muscle mass.
CONCLUSIONS
The frequency of dietary intake revealed that older adults with PD consumed more sugary foods and alcoholic beverages, suggestive of “sweets and alcoholic beverages dietary patterns”, despite their disease condition. “High Protein dietary Pattern” on the other hand had a weak negative association with muscle mass. There is therefore the need for counsel for older adults to adopt healthier eating patterns and to establish healthier body weights by dieticians.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_462

DIGITAL SWEETNESS: HOW SOCIAL MEDIA MARKETING AFFECTS SUGAR-SWEETENED BEVERAGE CONSUMPTION AMONG ADOLESCENTS IN TAIWAN

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BACKGROUND AND OBJECTIVES
Recent research indicated that sugar-sweetened beverage (SSB) consumption among Taiwanese adolescents was quite high. Pervasive marketing campaigns on social media may be a key factor influencing dietary behaviors. This study, employing the Theory of Planned Behavior (TPB) framework, aimed to investigate how social media marketing (SMM) affects adolescents' SSB consumption behaviors in Taiwan.
METHODS
A cross-sectional online survey assessed self-reported SSB consumption behaviors, social media engagement, and SMM-related TPB factors among 654 senior high school students who were regular SSB consumers and active social media users. Participants were grouped by weekly SSB consumption frequency: low-consumption (1–3 times), medium-consumption (4–6 times), and high-consumption (≥ 7 times).
RESULTS
Males, non-metropolitan school students, those with a high weekly allowance (≥ NT$1000 (≈US$31)), those with a preference for more-sugar options, those who spent ≥ 3 hours daily on social media, and those who exhibited a higher level of exposure to SMM were significantly correlated with high SSB consumption. After adjusting for certain demographic factors, the multinomial logistic regression model revealed that screen time, SMM-related perceived behavioral controls, and SMM-related purchase intentions affected SSB consumption. Furthermore, SMM-related purchase intentions mediated this impact.
CONCLUSIONS
This study emphasizes the need for stricter regulations on social media food marketing to protect adolescents. Further research should explore effective strategies leveraging social media to reduce adolescents' SSB consumption.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_463

タイトルを入力しVIEWPOINTS ON DESIRABLE HEALTH CONDITIONS, AND TRAINING SATISFACTION AMONG UNIVERSITY ATHLETESてください

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BACKGROUND AND OBJECTIVES
In recent years, nutritional and dietary support for athletes has been widely implemented. However, not all support aligns with established nutrition management theories. One underlying factor is the challenge of setting outcome goals for athletes. In addition to applying objective indicators, which are typically limited by their invasiveness and cost, identifying simple and valid health assessment indicators could facilitate their use in assessments during nutrition education interventions. This study aimed to identify the health and nutritional status items that athletes strive for as a preliminary step toward creating a health assessment score that can serve as an outcome goal for nutrition education interventions.
METHODS
From June to July 2024, individual interviews were conducted with eight university student athletes and eight sports coaches. The interview questions focused on (1) desirable health conditions for training and (2) perspectives for evaluating satisfaction with training. Verbatim interview transcripts were created, and the textual data were segmented into individual content units. For each segmented piece of information, we summarized (coded) the content into concise and appropriate codes. Codes with similar content were grouped into subcategories and subsequently into broader categories.
RESULTS
Desirable health conditions for training were summarized into 18 subcategories and further grouped into 7 categories: “overall physical condition,” “musculoskeletal condition,” “digestive condition,” “weight control,” “psychological condition,” “prevention of symptoms and injuries,” and “other health conditions.” Ten subcategories, such as “energy is replenished,” “fatigue recovery is achieved,” and “not feeling exhausted during training” were identified by both athletes and coaches. Perspectives for evaluating training satisfaction were summarized into 24 subcategories and further grouped into nine categories: “performance,” “goal setting and achievement,” “psychological satisfaction,” “technical satisfaction,” “physical satisfaction,” “adjustment ability,” “physical outcomes,” “relative self-evaluation,” and “observational evaluation by coaches.” Among these, nine subcategories, including “performance,” “maintaining focus,” and “approaching training without anxiety,” were common to both athletes and coaches.
CONCLUSIONS
Based on these findings, this study aimed to develop and validate health indicators for athletes.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_464

A STUDY ON COMPARATIVE ANALYSIS OF THE BACTERIAL COMMUNITIES IN THE GUT OF HEALTHY, OBESE AND UNDERWEIGHT CHILDREN

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BACKGROUND AND OBJECTIVES
Gut dysbiosis, marked by an imbalance between beneficial and harmful bacteria, is a characteristic feature of malnutrition. However, there is a lack of a standardized microbial index for assessing gut health in community studies. Therefore, the objective of the study is to determine the relative abundance of key bacterial communities in underweight, obese, and normal-weight children and adolescents using the quantitative PCR technique (qPCR).
METHODS
A case-control study was conducted in the urban settlement of India with children aged 6-18 years (n=72) categorized into three equal groups: thin (BAZ <-2 SD; case – group 1), normal-weight (controls), and obese (BAZ> 2SD, case – group 2). Electronic data collection toolkit was used to collect data on socio-demographic characteristics and standardised equipment was used to collect data on anthropometry. Fecal samples were collected and analyzed using the Roche Light Cycler 480 PCR machine by the qPCR technique. The relative abundance of target bacteria species were calculated with respect to the abundance of total bacteria species of each sample. The level of significance was kept $p<0.05$ for ANOVA.
RESULTS
The data of qPCR revealed a significantly higher abundance of Lactobacillus and Bacteroides in obese children.The increased abundance of Lactobacillus is probably due to small intestinal bacterial overgrowth in obese children and an increased Bacteroides could be due to an high bile turnover leading to an increase in bile tolerant bacteria Bacteroides. The abundance of Bifidobacterium was found to be higher in normal children and a lower abundance in obese children. The lower abundance of Bifidobacterium in obese children could be due to increased chronic inflammation in colon.
CONCLUSIONS
qPCR based biomarkers can be used to screen gut health of children in communities. Early response to interventions may be easily evaluated by using these markers.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_465

CHANGES OF PREGNANT WOMEN'S BODY COMPOSITION AT DIFFERENT GESTATIONAL WEEKS AND ITS CORRELATION WITH NEONATAL BIRTH WEIGHT

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BACKGROUND AND OBJECTIVES
Changes in maternal body composition during pregnancy are associated with pregnancy outcomes, Neonatal birth weight is an important indicator for assessing maternal nutritional status and fetal health. This study aims to examine the changes in body composition throughout pregnancy and investigate their correlation with neonatal birth weight.
METHODS
A total of 479 singleton pregnant women who delivered at Fuxing Hospital, Capital Medical University, between 2017 and 2019 were included. Body composition measurements, including body fat, body fat percentage, trunk fat mass, and visceral fat area, were obtained using a body composition analyzer. The relationship between these body composition parameters at different stages of pregnancy and neonatal birth weight was analyzed.
RESULTS
Body composition increased with advancing gestational age. Pearson correlation analysis revealed a positive correlation between body fat and trunk fat mass in mid-to-late pregnancy and neonatal birth weight. In the late pregnancy period, visceral fat area also showed a positive correlation with birth weight (p<0.05). After adjusting for covariates, body fat and trunk fat mass in late pregnancy remained positively correlated with neonatal birth weight, with statistical significance (p<0.05). The trend of change in body fat during pregnancy was positively associated with birth weight (B = 55.27, p = 0.000). Similarly, the trend of change in body fat percentage was positively correlated with birth weight (B = 37.52, p = 0.014), and the trend of change in visceral fat area was also positively associated with birth weight (B = 8.96, p = 0.000).
CONCLUSIONS
Changes in maternal body composition during pregnancy can influence fetal birth weight.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_466

EFFECT OF ULTRA-PROCESSED FOOD CONSUMPTION ON THE GUT MICROBIOTA IN THE FIRST YEAR OF LIFE

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BACKGROUND AND OBJECTIVES

The first years of life are fundamental for the establishment of the gut microbiota, with diet being one of the main early exposures. The beneficial effect of breastfeeding is well known; however, there are important gaps in the literature on the effects of ultra-processed food (UPF) consumption and research on healthy children in low- and middle-income countries, particularly in longitudinal and large sample designs. Through a population-based prospective birth cohort study, we investigated the effects of UPF consumption on the gut microbiota of children during the first year of life.

METHODS

This study included children from the MINA-Brazil population-based birth cohort with gut microbiota data available at the 1-year follow-up (n=728). Data on breastfeeding practices were collected after childbirth and during follow-up visits. Complementary feeding was measured using a semi-structured questionnaire, referring to the day before the interview at the 1-year follow-up. A combined variable was generated according to breastfeeding practices and UPF consumption and was used as an independent variable in the adjusted median regression models, with alpha diversity parameters as the dependent variable. Beta diversity was analyzed using PERMANOVA according to Bray–Curtis dissimilarity and db-RDA adjusted by covariates. Relative abundance was analyzed using ANCOM-BC (FDR) and MaAsLin2 was used for multivariable analysis.

RESULTS

Weaned children who consumed UPF showed a significant increase in alpha diversity for all parameters in the median regression models (Observed ASVs: p-adj=.005; Shannon: p-adj=.036; Chao1: p-adj=.026; Simpson: p-adj=.012) and in beta diversity (PERMANOVA: p-adj=.006; db-RDA: p-adj<.001) compared to breastfed children who did not consume UPF. Breastfed children who did not consume UPF had a higher relative abundance of *Bifidobacterium* than weaned children who consumed UPF (p-adj<.001 for ANCOM-BC and MaAsLin2) and a lower relative abundance of *Firmicutes* (p-adj<.001 for MaAsLin2), *Blautia* (p-adj<.001 for ANCOM-BC and MaAsLin2), *Sellimonas* (p-adj=.008 for ANCOM-BC) and *Finegoldia* (p-adj=.045 for MaAsLin2) than weaned children who consumed UPF.

CONCLUSIONS

The findings of this cohort study suggest that UPF consumption may have effects on the diversity and abundance of the gut microbiota, being enhanced in children who have already been weaned.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_467

ASSOCIATION BETWEEN EARLY ADIPOSITY REBOUND AND THE INTAKE OF GRAIN, FISH AND MEAT, AND VEGETABLE DISHES AMONG JAPANESE PRESCHOOL CHILDREN: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
Early adiposity rebound (AR) has been reported to be a risk factor for adult obesity. The Japanese Ministry of Health, Labor, and Welfare recommends a meal that includes a Grain, Fish and Meat, and Vegetable Dish for prevention of disease, but to date no studies have examined the relationship between AR and intake of meals that include a grain, fish and meat, and vegetable in preschool children. In this study, we examined the relationship between AR and intake of meals that include a grain, fish and meat, and vegetable dish.
METHODS
We conducted an online self-reporting questionnaire survey among 750 mothers with children aged 3 and older who had been registered with an online research company. The questionnaire is a Japanese version of a nutritional status screening questionnaire that we developed to assess nutritional risks of infants (22 items including frequency of intake by food group, lifestyle, financial status, etc.). We were provided photos of height and weight measurements at 18 months and age 3 written on the maternal and child health handbooks at mandatory health check-ups. AR was calculated by subtracting BMI at 18 months from BMI at age 3. Children with values greater than zero were classified into the AR group (n=193), and the remainder were classified into the non-AR group (n=488). We scored intake status of each food group depending on the frequency of favorable meal intake, and calculated comprehensive risk scores (0-12 points; higher scores indicate less favorable RESULTS) of grain, fish and meat, and vegetable dish. Logistic regression analysis was performed with the presence or absence of AR as the dependent variable, and the logarithmically transformed risk scores for grain, fish and meat, and vegetable dish, and confounding factors as independent variables.
RESULTS
The BMI of the AR group at age 3 was higher than that of non-AR group, and the risk score associated with an grain, fish and meat, and vegetable dish was high. Logistic regression analysis showed that an elevated grain, fish and meat, and vegetable dish risk score correlated with higher risk of AR (adjusted odds ratio; 2.59（95%CI: 1.09-6.16）.
CONCLUSIONS
This study suggests that meals that include a grain, fish and meat, and vegetable dish are recommended even during preschool children because an elevated grain, fish and meat, and vegetable dish risk score correlated with higher risk of AR.
This work was supported by Children and Families Agency Program Grant Number JPCA21DA2001 and 24DB0101.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_468

EFFECTS OF GENETIC VARIATION ON RESTING METABOLIC RATE AND DIET-INDUCED THERMOGENESIS IN HEALTHY YOUNG WOMEN

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BACKGROUND AND OBJECTIVES
In modern Japanese society, the diversification of lifestyles has led to meals becoming markedly more Westernized, and there are concerns that these changes may lead to future health issues. Resting metabolic rate (RMR) and diet-induced thermogenesis (DIT) plays an important role in energy metabolism. Enhancement of these rates are expected to prevent fat accumulation and obesity by increasing energy expenditure in response to overeating. This research aimed to determine whether single nucleotide polymorphisms (SNPs) of obesity-related genes affect RMR and DIT.
METHODS
Participants were 52 healthy young women. We measured oxygen consumption, metabolic rate, respiratory quotient, and heart rate for 360 min before and after a standard meal (652 kcal, protein: fat: carbohydrate (PFC) ratio of 16.0: 28.2: 55.8 %). We asked participants about their lifestyle, measured their body composition, collected oral mucosa, and analyzed SNP (rs1042713) of β2 adrenergic receptor (β2-AR), SNP (rs4994) of β3 adrenergic receptor (β3-AR), and SNP (rs1800592) of uncoupling protein 1 (UCP1). The study was approved by the Kyoto Women's University Research Ethics Committee.
RESULTS
The β2-AR genotype was classified as 27% AA wild, 48% AG hetero, and 25% GG homo type; the β3-AR genotype was classified as 60% TT wild, 40% TC hetero, and 0% CC homo type; and the UCP1 genotype was classified as, 29% AA, 42% AG hetero, and 29% GG homo wild type. The genotype of β2-AR and β3-AR did not affect RMR and DIT in the standard meals, but the homo mutant type of UCP1 had a significantly lower RMR, muscle mass and lean body mass compared with those in the hetero mutant and wild type of UCP1.
CONCLUSIONS
The RESULTS suggest that energy expenditure and body composition might be affected by SNPs of UCP1 in healthy young women.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_469

RELATIONSHIPS AMONG BODY IMAGE, EATING BEHAVIORS, AND DEPRESSION IN RELATION TO EATING DISORDER TENDENCIES AMONG YOUNG JAPANESE WOMEN

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BACKGROUND AND OBJECTIVES
A number of Japanese young women are at risk for eating disorders (ED) and they do not have access to clinical support, aside from those who have already been diagnosed with ED. This study aimed to compare eating behaviors and body image between high and low tendency groups for ED as measures to suggest future nutrition education strategy.
METHODS
An online survey was conducted in November 2024. The survey assessed symptoms of ED, eating behaviors and dieting habits. The final dataset included 181 women (average age: 25.9 years), who had not been diagnosed with an ED. The assessment was based on scores from the following measures: Eating Disorder Examination-Questionnaire Short (EDE-QS), Patient Health Questionnaire-2 (PHQ-2), Body Appreciation Scale-2 (BAS-2), Three-Factor Eating Questionnaire-R21-Cognitive restraint (TFEQ-R21-CR), Subjective Diet-Related Quality of Life (SDQOL), as well as questions on body image. Participants' tendencies toward ED were categorized into two groups (low and high) based on a cutoff. The Mann-Whitney U test was conducted to compare two groups. Binary logistic regression analyses were also performed to determine factors associated with high ED tendencies.
RESULTS
The low-tendency group comprised 72.9% of the participants while the high-tendency group consisted of 27.1% of the participants. In the low-tendency group, 28.0% of the individuals self-identified as overweight, which was significantly lower ($p = 0.008$). 72.0% of participants in the low-tendency group reported no distortion in their body image, which was significantly higher than high-tendency group ($p = 0.002$). The proportion of individuals with low TFEQ scores, high SDQOL scores, and low PHQ-2 scores was significantly higher in the low-tendency group ($p < 0.001$, $p = 0.003$, $p < 0.001$, respectively). Logistic regression analysis revealed significant associations between high ED tendencies and the following factors: TFEQ (OR: 2.751; 95% CI: 1.290-5.864, $p = 0.009$), SDQOL (OR: 0.838; 95% CI: 0.733-0.959, $p = 0.010$), PHQ-2 (OR: 1.877; 95% CI: 1.404-2.510, $p < 0.001$), and BAS-2 (OR: 2.828; 95% CI: 1.601-4.995, $p < 0.001$).
CONCLUSIONS
Our findings suggest that nutrition education may help correct distorted body image, prevent restrictive eating behaviors, and enhance SDQOL, thereby maintaining a low risk of ED among young Japanese women. Further studies are required to scrutinize a relationship between inappropriate dietary restrictions and positive body image, which could result in a higher ED tendency.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_470

VALIDITY AND RELIABILITY OF THE JAPANESE VERSION OF SHORT FOOD LITERACY QUESTIONNAIRE IN OLDER ADULTS

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BACKGROUND AND OBJECTIVES
Food literacy (FL) is essential for Japanese community-dwelling older adults to improve their diet to prevent frailty. To develop an assessment tool for FL of Japanese older adults, this study aimed to evaluate the validity and reliability of the Japanese version of the short food literacy questionnaire (SFLQ), originally developed by Krause et al.
METHODS
SFLQ (16 items) was translated into Japanese by three Japanese researchers, and a researcher whose mother language is English checked the back-translated version of Japanese SFLQ. Japanese SFLQ has been modified until all the researchers agreed. A paper-based questionnaire survey was conducted to assess the validity and reliability of Japanese SFLQ for community-dwelling older adults in December and November 2024. The survey questionnaire included Japanese SFLQ (score range: 16–90) assessing for FL, HLS-Q12 (score range: 12–48) for health literacy (HL), healthy eating literacy scale (score range: 5–25) for healthy eating literacy (HEL), eHEALS (score range: 8–40) for eHealth Literacy (eHL) and knowledge tests. The knowledge tests included two questions regarding components of the Japanese food guide and vegetable intake recommended by the government. Reliability was tested using Cronbach's α. Validity was evaluated using correlations (Kendall's τb) between HL, HEL, eHL, and FL or using *t*-tests to identify the difference in FL by the knowledge test RESULTS.
RESULTS
One hundred and forty-five Japanese community-dwelling older adults participated in this study (85.5% female, mean age 81.4). The overall median (25, 75 percentiles) scores of FL, HL. HEL, and eHL were 57 (51.5, 61), 30 (26, 34), 19 (17, 21), and 16 (8, 24), respectively. Cronbach's α of FL was high (α = 0.918). Weak and moderate correlation coefficients were observed between FL and HL (τb = 0.320), and FL and HEL (τb = 0.453), while there was no correlation between FL and eHEALS (τb = 0.163). The mean FL scores did not differ by the RESULTS of the Japanese food guide test (P = 0.394) but the mean FL score of the participants who answered correctly in the vegetable test was higher than that of the participants who did not (P = 0.002).
CONCLUSIONS
The validity and reliability of the Japanese SFLQ were confirmed in Japanese community-dwelling older adults.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_472

HE ROLE OF SCHOOL LUNCHES FROM THE PERSPECTIVE OF THE SEASONINGS USED IN JAPANESE CUISINE

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BACKGROUND AND OBJECTIVES
School lunches in Japan, which were started with the aim of helping children living in poverty, have changed their role as the times have changed. Today, school lunches not only provide appropriate nutrition, but also serve as a 'teaching tool for learning about food'. As a result, the content of the menus has also changed. In this study, we compared the seasonings used in school lunches in the past and today, and aimed to clarify the role of school lunches in the past and today by clarifying the changes in Japanese cuisines served in school lunches.
METHODS
The method was to classify the dishes into Japanese, Western and Chinese cuisine, using the menus published in the 'Monthly School Lunch' magazine from 1961 to 1965 and from 2019 to 2023. Next, Japanese cuisines were classified into staple foods, main dishes and side dishes. Furthermore, the use of 19 types of seasonings used in Japanese dishes, such as soy sauce, salt, sugar, natural dashi and mirin, was investigated. The analysis method used was the $\chi 2$ test. IBM SPSS Statistics 27 was used for the analysis, and the significance level was set at 5%.
RESULTS
The number of dishes extracted was 2743 (1960s: 1204 dishes, modern: 1539 dishes). The proportion of Japanese cuisines has increased from 36.4% in the 1960s to 74.1% in the present day. In seasonings, the use of natural dashi has increased from 8.3% in the 1960s to 37.4% in the present day, and mirin has also increased from 0% to 26.9%. On the other hand, the use of chemical seasonings has decreased from 14.9% in the past to zero in the present day, showing that the authentic flavour of Japanese food dishes is progressing.
CONCLUSIONS
These changes show that school lunches today are playing a role in passing on food culture by providing children with authentic flavors, rather than just providing nutritional supplements. School lunches have moved on from their role as nutritional supplements, and today they are playing a role in passing on food culture by providing children with authentic flavors, which are less common at home, and even going so far as to use particular seasonings.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_473

High reliance on vitamin D-fortified foods and oral supplements among young children in Sweden: RESULTS from a national, population-based dietary survey from 2021-24

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BACKGROUND AND OBJECTIVES
Vitamin D is essential for skeletal development in small children. In Sweden, where sun exposure is low during winter, vitamin D-fortified foods such as milk, yoghurt and fat spreads, and to a lesser extent, fatty fish are important dietary sources but may also generate significant greenhouse gas emissions (GHGEs). This study aimed to assess vitamin D intake, main dietary sources of vitamin D and their climate impact, as well as determinants of vitamin D status in young children in Sweden.
METHODS
Data from the Swedish national dietary survey Riksmaten Young Children 2021-24 (ages 18 months, n=1074; 4 years, n=746) included dietary intake from a two-day food diary, non-consecutive days, linked to databases for food composition and climate impact. 25-hydroxyvitamin D (25(OH)D) was measured from plasma (18 months, n=281; 4 years, n=270) by high performance liquid chromatography-mass spectrometry. Linear regression assessed associations between 25(OH)D and vitamin D intake (including oral vitamin D drops), other supplement use, sampling season, age, parents' origin, and household education.
RESULTS
Vitamin D intakes below the average requirement (7.5 µg/d) were observed in 16% of 18-month-olds and 61% of 4-year-olds. Oral vitamin D drops accounted for 50% of intake in 18-month-olds and 8% in 4-year-olds. Additional dietary sources for 18-month-olds included fortified dairy and fats (20%) and porridge (15%). For 4-year-olds, main dietary sources were fortified dairy and fats (49%), fish and shellfish (7%), and porridge (5%). These foods contributed 0.3 kg CO_2 equivalents per day, or 17% of total diet-related GHGEs with fortified dairy accounting for 13%. For 25(OH)D, 7% of 18-month-olds and 4% of 4-year-olds were below 50 nmol/l, but none were vitamin D deficient (<30 nmol/l). Regression RESULTS showed 25(OH)D associated with vitamin D intake (β=+0.91, $p<0.01$), sampling during winter (β=-3.74, $p<0.01$) and parents' origin outside Nordics (β=-3.62, $p=0.02$).
CONCLUSIONS
A large proportion of young children in Sweden, particularly 4-year-olds, are at risk of having inadequate vitamin D intake. Despite this, no children were vitamin D deficient. Oral vitamin D drops were the main source at younger age, whereas at older age, fortified dairy products contributed most, and in addition, accounted for a large share of diet-related GHGEs. Future strategies should aim to improve vitamin D intake while also addressing the environmental impact of dietary sources.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_474

MULTIPLE MICRONUTRIENT STATUS AND FACTORS ASSOCIATED WITH ANEMIA AMONG ADOLESCENTS IN SENEGAL

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BACKGROUND AND OBJECTIVES
Anemia, especially established during adolescence, remains one of the most widespread public health concerns. However, studies about micronutrient status in Senegalese adolescents are scarce. This study aimed to determine the factors associated with anemia among Senegalese adolescents.
METHODS
A nationwide representative cross-sectional study was conducted in Senegal in November-December 2023 including 2,193 adolescent, boys and girls aged 10-19 years, selected from 2,260 households through a stratified three-stage sampling procedure. Sociodemographic, health, and dietary data were collected by questionnaire. Nutritional status was assessed using BMI-for-age and waist-to-height ratio. Dietary diversity was measured using 24-hour dietary recall. Biomarkers (hemoglobin, serum ferritin, vitamins B9 and B12) were measured and the diagnosis of sickle-cell disease was made by Emmel test, according to standardized protocols. Associations between anemia and sociodemographic, nutritional status and biological characteristics were modeled using multivariable logistic regressions.
RESULTS
Nearly 23% of Senegalese adolescents were underweight and 7.5% suffered from overweight/obesity. Iron deficiency, vitamin B9 and B12 deficiencies affected 24.2%, 2.8% and 1.8% of adolescents, respectively. The prevalence of sickle cell disease was 8.4%. Overall, 29.1% of adolescents were anemic and among them, 11.4% suffered from iron deficiency anemia. More than 80% had reached the minimum dietary diversity. Adolescents aged 15-19 years (OR=1.812; P=0.001), iron deficient (OR=3.032; P<0.001) and suffering from sickle cell disease (OR=1.730; P=0.045) were at greater risk of suffering from anemia. Those who ate fruits 3 to 7 days per week were 49% less likely to suffer from anemia (OR=0.514; P=0.002).
CONCLUSIONS
Anemia and iron deficiencies are moderate public health problems among Senegalese adolescents, whereas prevalences of vitamin B9 and B12 deficiencies are low. Nutrition policies and strategies targeting 15-19 years old adolescent considering dietary patterns and sickle cell disease, are essential to effectively fight against anemia.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_475

CURRENT BODY IMAGE OF BUSINESS GROUP FEMALE VOLLEYBALL PLAYER AND THE EFFECTS OF NUTRITION EDUCATION

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BACKGROUND AND OBJECTIVES
Concerns about body image are a major problem for athletes, as they can lead to eating disorders. It has also been shown that this tendency is stronger in women than in men. This study examined the current state of body image in Business group female volleyball player and the effects of nutritional education.
METHODS
The subjects were 15 Business group female volleyball player (age 22.2 ± 2.2 years) to belong to Japan Volleyball Association who gave consent for the study. Questionnaires on body image, physical measurements, and dietary surveys were conducted in April and September 2023, with nutrition education provided between the first and second surveys. Questionnaire items were body image, health status, dietary behavior, and dietary awareness. For the body image item, a silhouette chart created by Thompson & Gray was used. Then, a comparison was made before and after the nutrition education intervention regarding the body image questionnaire.
RESULTS
The subjects were of normal build, with a height of 166.0 ± 6.7 cm, a weight of 60.8 ± 5.0 kg, and a BMI of 22.2 ± 2.3. However, none of them were satisfied with their current weight in the first survey. In the second survey, the number of respondents who were satisfied with their current weight increased to two. The number of respondents who felt they were in good health increased significantly from the first survey to 10 (66.7%). Body image survey RESULTS showed that the participants perceived their current body shape as normal (5.1±1.3), which did not change due to nutrition education. The ideal body type tended to choose a thin body type, but nutrition education significantly increased the mean ideal body type, 3.6 ± 0.7 in the first survey and 4.1 ± 0.7 in the second survey. In level of ideal dissatisfaction, which is calculated as the difference between the ideal body shape and the current body shape, it was significantly smaller, -1.5±1.2 in the first survey and -0.9±1.3 in the second survey.
CONCLUSIONS
Nutrition education has been shown to improve not only health status and food awareness, but also body image. It is hoped that appropriate nutrition education for athletes will lead to the resolution of body image concerns.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_476

THE EFFECTS OF BODY COMPOSITION, DIETARY INTAKE AND TRAINING OF MALE ATHLETES ON BLOOD ALT AND Γ-GTP

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BACKGROUND AND OBJECTIVES
In athletes, impaired liver function may lead to delayed recovery from fatigue and reduced performance. Factors that can cause a decline in liver function in the general population include overeating, excessive alcohol consumption, and a lack of exercise. However, as previous studies were limited to heavyweight athletes, it is unclear whether the same relationship would be observed in other athletes who are not overweight. Furthermore, there is no established method for conditioning athletes to restore their liver function. Therefore, in this study, we decided to analyze in detail the factors related to the deterioration of blood test data, which are indicators of liver function, based on the physical composition, dietary intake, and physical activities of athletes from various sports.
METHODS
The subjects were 132 male athletes aged between 18 and 40 years (sports: track and field, lifesaving, judo, wrestling, swimming, gymnastics, basketball, American football etc.). We performed body composition measurement using impedance method, training survey, semi-quantitative diet survey for 3 days, and fingerstick blood test. Statistical analysis was performed based on blood test data of the subjects, and the data was divided into two conditions (ALT<30 group (n=98) vs ALT≧30 group (n=34), γ-GTP<50 group (n=8) vs γ-GTP≧50 group (n=124)), and compared using the Mann-Whitney U test.
RESULTS
Body weight, body fat percentage, and waist circumference (WC) were significantly higher in ALT≧30 group (weight:78.5kg, body fat:18.1%, WC:86.3cm) compared to ALT<30 group (weight:70.4kg, body fat:14.0%, WC:78.6cm) ($p<0.01$). Protein intake, carbohydrate intake, and carbohydrate % total energy intake (TEI) were significantly higher in γ-GTP≧50 group (protein:137.7g, carbohydrates:546.2g, carbohydrate%E: 61.1%) compared to γ-GTP<50 group (protein:111.1g, carbohydrates:367.4g, carbohydrate %E:54.8%) ($p<0.01$). On the other hand, the fat % TEI was significantly lower in the γ-GTP≧50 group (fat %E:22.2%) compared to the γ-GTP<50 group (fat %E:28.3%) ($p<0.05$).
CONCLUSIONS
In male athletes, it was thought that overweight and high body fat percentage, as in the general population, would affect liver function. In this study, overweight athletes with impaired liver function had a low energy intake (EI) from fat and a high energy from carbohydrate, so it was thought that excessive carbohydrate intake might be a problem. In order to improve liver function of athletes, it was thought that it would be necessary to adjust PFC (protein, fat, carbohydrate) balance without lowering EI from fat too much.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_478

FOOD SYSTEM PLATFORMS: PROMOTING WOMEN, YOUTH, AND CIVIL SOCIETY ENGAGEMENT TO IMPROVE NUTRITION

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BACKGROUND AND OBJECTIVES
Taking action to transform our food system is key to fighting malnutrition in all its forms. Food system platforms could facilitate improving nutrition outcomes in vulnerable urban populations. This study aimed to promote the development of the Food System Platforms (FSP) and to increase the participation of women, youth, and civil society organizations (CSO) in the FSP in two cities each in Kenya and Rwanda.
METHODS
We applied an intervention strategy focused on improving the capacities of the cities to increase leadership, as well as intercity peer learning and experience-sharing concepts. The intervention strategy included awareness campaigns that highlighted the significance of women, youth, and CSO involvements, stakeholder mapping identifying key actors required to strengthen platform membership, gender training sessions emphasizing the mainstreaming of gender in FSP action planning and implementation, and platform institutionalization e.g., to make them part of city by-laws or formal standing committees.
RESULTS
After the intervention strategy, in the Kenyan cities, new platforms were established, capacity-building sessions were organized to increase understanding of the FSP operational approach, and peer-learning meetings took place between cities working on urban food systems. These FSPs have a formulated vision and mission and are working to develop food system charters for improving visibility in the cities and to establish legitimacy and authority in food systems transformation. The FSP together with other stakeholders was involved in the development of the county food safety policy. In the Rwandan cities, new platforms were also created as a sub-committee of the existing larger district Joint Action Development Forum (JADF). Moreover, steps have been taken to involve organizational members (e.g., local CSO and consumer groups), and to succeed in institutionalizing the platforms through facilitated discussion and validation workshops. The participation of women, youth, and CSOs in the FSP has increased in the cities involved in both countries (Table N°1).
CONCLUSIONS
Women, youths, and CSOs' participation and engagement in the FSPs have increased and improved the food systems strategy development agenda in all the cities. There is a need to continuously engage and develop adapted intervention strategies to the different roles of women, youth, and CSOs in FSP activities. This engagement is necessary for developing and implementing the FSPs' actions to succeed in improving nutrition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.
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EPO5_480

CHANGES IN OBESITY AMONG URBAN AND RURAL PRIMARY SCHOOLCHILDREN OVER A DECADE: INSIGHTS FROM SEANUTS I AND II MALAYSIA

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BACKGROUND AND OBJECTIVES

Rapid urbanisation has led to unhealthy diets and sedentary lifestyles among children, impacting their nutritional status. These effects may differ by residential areas. This study examines changes in obesity indices among primary schoolchildren aged 6.0-12.9 years over the past decade.

METHODS

Data from 1,433 children in SEANUTS I (2010/2011) and 1,527 children in SEANUTS II (2019/2020) were analysed. Body weight, height, waist and hip circumferences were measured and used to derive obesity indices, including body mass index (BMI), waist-to-hip ratio (WHR), and waist-to-height ratio (WHtR). Complex samples general linear model was employed to compare changes in obesity indicators between urban and rural children across the two surveys.

RESULTS

Study findings highlighted significant changes in childhood obesity and body composition over the decade, showing clear differences between urban and rural areas. In urban locations, overweight and obesity rates among children dropped from 34.1% to 28.5% ($p=0.031$). This decline was accompanied by lower average body weight (33.8 kg in 2010 vs. 32.3 kg in 2020, $p<0.05$) and BMI (18.1 kg/m² in 2010 vs. 17.5 kg/m² in 2020, $p<0.01$). Additionally, urban children experienced a 75% lower BMI-for-age z-score in 2020 (SEANUTS I: 0.28; SEANUTS II: 0.07, $p<0.05$). Conversely, in rural areas, prevalence of overweight and obesity increased from 25.7% to 31.6%, although this change was not statistically significant ($p=0.123$). However, waist and hip circumferences were notably higher in 2020 at 62.4cm (2010: 59.4cm, $p<0.01$) and 73.7cm (2010: 71.4cm, $p<0.05$), respectively. Indicators of central obesity, including WHR and WHtR, among rural children were 0.44 and 0.83, respectively, in 2010, but were higher at 0.46 ($p<0.001$) and 0.84 ($p<0.01$) after a decade.

CONCLUSIONS

Over the course of a decade, while urban children have shown declines in obesity rates, rural children have experienced increases. Tailored interventions that address the specific challenges faced by different residential areas are urgently needed, with a particular focus on rural communities.

CONFLICTS OF INTERESTS

Ilse Khouw is an employee of FrieslandCampina. All other authors declare no conflict of interest.

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EPO5_481

NUTRITIONAL ASSESSMENT OF CHILDREN IN RURAL CAMBODIA: NUTRITIONAL VALUES BASED ON DIETARY SURVEYS WITH PHOTOGRAPHS

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BACKGROUND AND OBJECTIVES

Cambodia's infant mortality rate (per 1,000 live births) has been declining since 2000 (1990: 85, 2021: 21), and has since dropped below the world average of 28 (1). However, rates of stunting, wasting, and malnutrition in children are higher than the global average. Since 2017, SHARE, an NGO, has been conducting a project to improve child nutrition in the north part of Cambodia, the most impoverished province (44.3% stunting rate) of Preah Vihear. However, infant and young child feeding (IYCF) initiatives conducted to date have been unable to concretely determine the status of dietary and nutritional intake. This study aimed to conduct a dietary survey and nutritional assessment of children under 5 in rural Cambodia to determine appropriate approaches to nutritional interventions.

METHODS

The target area covered four of the seven counties in the province of Preah Vihear. A baseline survey (random sampling method, 123 participants) was conducted, and 40 children under 5 years of age who were determined to be at high risk of wasting, stunting, and being underweight were selected. In February 2024, the caregivers kept dietary records for three days (using food records, photographs, interviews). The mean and standard deviation of the daily intakes of Energy (E), Protein (P), Ca, and Fe were calculated for ages 1-5 years.

RESULTS

A total of 120 days' worth of data was collected from 38 participants, of which 84 days were complete with no missing data. Two children were under 1 year old and breastfed.

【1 year old (n=10)】E:550±192 kcal P:22±11 g Ca:181±157 mg Fe:2.6±1.2 mg

【2 years old (n=11)】E:775±233 kcal P:29±12 g Ca:175±113 mg Fe:4.6±2.5 mg

【3 years old (n=11)】E:708±228 kcal P:28±8 g Ca:108±41 mg Fe:4.0±1.6 mg

【4 years old (n=2)】E:957±130 kcal P:40±9 g Ca:116±23 mg Fe:4.8±0.7 mg

【5 years old (n=2)】E:920±442 kcal P:46±28 g Ca:138±74 mg Fe:5.8±2.8 mg

During the survey period, the percentages of children who consumed discretionary processed foods and beverages were 40% for juices, 37% for snacks, and 29% for sweet processed foods.

CONCLUSIONS

We investigated the dietary intake and nutritional status of 38 children in rural Cambodia. A trend was that all items were significantly lower than the WHO's RDA. As nutritional status from infancy to around 3 years of age is related to growth disorders, it was suggested that prompt nutritional intervention is necessary.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_482

DIET QUALITY IMPROVEMENT ASSOCIATED WITH A NUTRITION ASSISTANCE PROGRAM IN THE WORKPLACE

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BACKGROUND AND OBJECTIVES

Public food and nutrition policies have a notable impact in reducing poverty and food insecurity, but their influence on the diet quality of participants is not completely clarified. This study aimed to evaluate the association of participation in a nutritional assistance policy with food quality.

METHODS

Cross-sectional, comparative study of manufacturing workers from companies participating and not participating in the Worker's Food Program (WFP). A combined stratified and two-stage sampling was used to obtain a probability sample of workers from northeastern Brazil. Usual food consumption was assessed with the 24-hour dietary recall method and diet quality with the Diet Quality Index-International (DQI-I). Multiple linear regression was used to analyze the association between the DQI-I score and its categories and components with WFP participation, worker's sex, and their interaction.

RESULTS

The survey included 441 workers from 16 WFP companies and 480 workers from 17 non-WFP companies. The RESULTS showed that WFP participation was associated with better diet quality ($p = 0.002$). Interaction analysis showed that the difference was significant only among women ($p = 0.001$). In the analysis of DQI-I categories, the score for the Variety category was higher among WFP participants ($p = 0.005$), as were the scores for the component's food groups ($p = 0.008$) and sources of protein ($p = 0.032$). The Adequacy category showed better scores among WFP participants ($p = 0.034$) in both sexes (interaction $p = 0.73$). The Moderation category didn't show association with WFP participation ($p = 0.30$), but among their components, WFP participation was associated with lower consumption of saturated fat and sodium, but only among women (interaction $p = 0.032$ and $p = 0.053$, respectively). WFP participation was not associated with scores in the Overall Balance category ($p = 0.17$).

CONCLUSIONS

Participation in a WFP was positively associated with better diet quality as assessed by the DQI-I, with a more pronounced effect in women.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_484

SUGAR REFORMULATION IN SOLID FOODS: LIMITATIONS AND CHALLENGES

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BACKGROUND AND OBJECTIVES
The global obesity epidemic is a pressing public health issue, driving the search for effective interventions. One approach, sugar reformulation in foods, has gained attention for its potential to reduce calorie intake and curb obesity. While this strategy has shown promise in sugar-sweetened beverages (SSBs), its application to solid foods is less understood and may carry distinct challenges and risks.
METHODS
This work examines the efficacy of sugar reformulation in solid foods by analyzing its technical feasibility, the differences between sugar in SSBs and solid foods, and the broader implications for obesity prevention. It also evaluates evidence from modelling studies and explores potential unintended consequences of reformulation efforts.
RESULTS
There were significant challenges in sugar reformulation for solid foods, including technical difficulties in maintaining taste and texture, and the possibility of replacing sugar with ingredients that may not offer health benefits. Evidence suggests that sugars in SSBs and solid foods differ in their impact on energy balance and metabolic health. Modelling studies supporting reformulation often have limitations, such as oversimplified assumptions and lack of real-world applicability.
CONCLUSIONS
While sugar reformulation in solid foods is a well-meaning intervention, it is unlikely to serve as a standalone solution for obesity prevention. In some cases, it could inadvertently contribute to the problem by introducing new health risks or shifting dietary patterns in unanticipated ways. A more cautious and evidence-driven approach is needed when considering reformulation as a public health strategy.
CONFLICTS OF INTERESTS
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EPO5_485

BREASTFEEDING DURATION AND DIET BEHAVIORS AMONG YOUNG CHILDREN IN THE [XXX]

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BACKGROUND AND OBJECTIVES
Breastfeeding plays a unique role in shaping children's long-term food preferences and dietary behaviors. Childhood overweight and obesity [OWOB] prevalence remains a global concern, with the prevalence among young children in the [XXX], exceeding the US national average. As breastfeeding initiation and duration decline in the [XXX], this study aims to examine the relationship between breastfeeding initiation status and duration and early childhood dietary behaviors among young children in the [XXX].
METHODS
Children's Healthy Living [CHL] Program baseline data, including 1140 children (ages 2-8 years) in the [XXX], were analyzed cross-sectionally. This study utilized comprehensive data including demographics, 2-day child diet records and caregiver-reported early feeding history. Diet quality was assessed using the US Dietary Guidelines Healthy Eating Index-2020 [HEI-2020] with data processed through the Pacific Tracker version 3.0. Breastfeeding history was categorized by initiation status (yes - ever breastfed, no - never breastfed), exclusive breastfeeding duration (0-6 months, 6 or more months), and breastfeeding duration (0-6 months, 6-12 months, 12 or more months). Statistical analysis employed means and ANOVA testing, accounting for clustering in the survey design. Comparisons were made of mean intake of sugar-sweetened beverages [SSB], water, HEI-2020 component and total scores across different breastfeeding categories.
RESULTS
Study participants were predominantly indigenous CHamoru children (58.2%), with most households earning an annual income below $35,000 (59.7%) and receiving food assistance (59.3%). Approximately 72.1% of children were breastfed, while 27.9% were never breastfed. Children who were breastfed had higher total HEI-2020 scores in childhood (p=0.03) and Meat intake (p=0.05) compared to children who were not breastfed. Children exclusively breastfed for 12+ months had lower SSB (p=0.02) and higher Meat (p=0.02) intakes in childhood relative to those breastfed for 0-6 months. Longer breastfeeding duration correlated with significantly better childhood total HEI-2020 scores (p=0.01), and Greens & Beans (p=0.02), Total Protein (p=0.01), and Fatty Acid Ratio (p=0.02) scores.
CONCLUSIONS
Breastfeeding, particularly extended duration, is associated with better diet quality in early to middle childhood. This highlights the importance of breastfeeding initiation and sustained duration as potential strategies to mitigate childhood OWOB in the [XXX].
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_486

FACTORS ASSOCIATED WITH DISCRETIONARY FOOD INTAKE TRAJECTORIES IN EARLY CHILDHOOD

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BACKGROUND AND OBJECTIVES
High intake of energy dense and nutrient poor discretionary foods is a global concern. Our understanding of how discretionary food intake changes in early childhood and associated factors is limited. This study explored the changes in discretionary food intake (i.e., trajectories) and its influencing factors in early childhood.
METHODS
Secondary data analysis of the Melbourne INFANT program (n=432) was conducted. INFANT is a cluster-randomized controlled trial that targets healthy eating and active play from infancy. It involves an intervention phase from age 3 to 18 months and a follow-up phase without intervention until age 60 months. Discretionary food intake was collected by three 24-hour recalls at ages 9, 18, 42 and 60 months. Group-based trajectory modelling described intake trajectories from ages 9 to 60 months. Multivariable logistic regression examined the association between intervention allocation, child, maternal characteristics and identified intake trajectories.
RESULTS
Three discretionary food intake trajectory groups were identified. Most children (59%) followed a “moderate” increasing intake trajectory with percentage energy intake increasing from 2.5% at age 9 months to 23.9% at age 60 months. Fourteen percent of the children followed a “high” increasing intake trajectory with percentage energy intake ranging from 5.0% to 42.0%. In contrast, the remaining children (27%) exhibited a “low” intake trajectory that had percentage energy intake ranging from 2.5% to 11.7%. Children from the intervention group (OR 0.52 95%CI 0.29, 0.94) and children of women with university education (OR 0.46 95%CI 0.23, 0.92) had lower odds of following the “high” intake trajectory group than children from the control group and children of women without a university education. Maternal pre-pregnancy body mass index (≥25 vs <25 kg/m2) was associated with higher odds (OR 2.09 95%CI 1.16, 3.77) of following the “high” intake trajectory group. No evidence of an association was found for maternal country of birth, marital status, child sex, body mass index z-score at birth, and gestational age.
CONCLUSIONS
Distinct trajectories of low, moderate, and high discretionary food intake were identified in early childhood. Children who received intervention in infancy were less likely to have a high discretionary food intake trajectory in early childhood. Lower maternal education and high pre-pregnancy body weight status were associated with the high discretionary food intake trajectory in early childhood.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_487

USE OF INTERNET AND SOCIAL MEDIA AND ITS ASSOCIATIONS WITH CURRENT AND IDEAL BODY MASS INDEX AMONG FEMALE HIGH SCHOOL STUDENTS IN JAPAN

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BACKGROUND AND OBJECTIVES
Being underweight and the desire to be thin are major concerns among young women, especially in Japan. Media exposure has been reported to lead to thin desire, mainly in Western countries, but there are few studies in Japan, where there is a high prevalence of underweight young women. This study examined associations of the use of the internet and social media as health information sources and time spent on electronic devices and social media with current and ideal body mass index among female high school students in Japan.
METHODS
A questionnaire was distributed to all students (2,567 male and female) in one randomly selected 2nd-grade class (generally aged 16-17 years) at each of 73 high schools in Tochigi Prefecture in 2022. Among 1,338 females who responded, this study included those who provided body height and current and ideal body weight (n=1,160), which were used to calculate body mass index (BMI). Participants were asked about their use of each health information source (e.g., the internet and social networking services [SNS], family members, television) and time spent on electronic devices (e.g., computers, smartphones), SNS (e.g., LINE, Twitter), and entertainment (e.g., YouTube, gaming).
RESULTS
Popular health information sources were the internet and SNS (68.6%) and family members (67.6%). The mean daily device use was 4.0 hours, including 1.7 hours on SNS and 2.3 hours on entertainment. Use of the internet and SNS as health information sources showed no association with current BMI but was associated with a lower ideal BMI (19.0 kg/m2 in non-users vs 18.7 kg/m2 in users, a difference [95% confidence interval] of 0.26 [0.03 to 0.48] kg/m2). Time spent on electronic devices, SNS, and entertainment showed negligible correlations with current and ideal BMI; Pearson's coefficients ranged from −0.07 (between SNS and ideal BMI) to 0.09 (between electronic devices and current BMI).
CONCLUSIONS
In this study of Japanese female high school students, the use of the internet and SNS as health information sources was associated with a marginally lower ideal BMI (mean difference of 0.26 kg/m2, indicating a difference of 0.7 kg for females with 158 cm). Also, this study showed negligible associations between time spent on electronic devices or social media and current or ideal BMI. Future research should examine exposure to specific content related to thin desire.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_488

LEVERAGING HUMAN CENTERED DESIGN TO ADDRESS SOCIAL NORMS WITHIN A LARGE-SCALE MULTI-SECTORAL NUTRITION INITIATIVE IN NEPAL

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BACKGROUND AND OBJECTIVES
Social norms are pivotal in shaping health and nutrition-related behaviors, yet addressing them effectively requires context-specific strategies. This study used human-centered design to collaboratively develop approaches for shifting harmful gender and social norms within USAID Integrated Nutrition, a multi-sectoral initiative aiming to improve the nutritional status of women, children, and adolescents in underserved communities of Nepal.
METHODS
Using human-centered design (HCD)-led discovery and generative design research, the study will systematically explore and co-create local solutions to shift regressive gender and social norms to improve nutritional outcomes among women, children, and adolescents. Discovery and generative design research will explore beliefs, motivations, and enablers for normative change in four districts of Nepal representing different agroecological zones. Methods will include facilitated group activities [n=15] and in-depth interviews [n=90] with mothers, fathers, and adolescents to understand aspirations, social networks, and other enablers. Semi-structured interviews [n=30] with community leaders, traditional and religious leaders, and providers will explore their recommendations. After co-design, facilitated group discussions [n=30] with the same groups will iteratively test and refine local solutions.
RESULTS
RESULTS forthcoming. Data collection will be conducted from January to February 2025. Ethical approval will be sought from the Nepal Health Research Council. Research participants will generate multiple products. These will include 1) user personas of program participant groups (e.g., women, children, adolescents); 2) decision graphs identifying factors influencing choice; 3) users' interactions with health and nutrition to identify narratives that shape nutrition service uptake; and 4) ecosystem maps of external forces including norms. Subsequent prototype design and testing will explore acceptable ways to shift the identified norms with different vulnerable groups (i.e., influencers of adolescent vs. older mothers).
CONCLUSIONS
This new application of HCD to nutrition-related social norms will elicit locally driven solutions from the most vulnerable groups, who are usually left out of policy and programs. To date, HCD has been primarily used to address behaviors, such as maternal dietary diversity, and this work fills the gap that HCD can be adopted to explore and address gender and social norms. Effective solutions will be adopted and scaled up to implement through USAID Integrated Nutrition in underserved communities across all provinces of Nepal.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_490

THE NUTRITION INFORMATION SOURCES USED AND TRUSTED BY 18-35 YEAR OLDS LIVING IN AUSTRALIA: A QUANTITATIVE ANALYSIS

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BACKGROUND AND OBJECTIVES
There is an increasing prevalence of obesity and non-communicable diseases amongst young adults living in high-income countries, such as Australia.[1] Nutrition and diet are recognised as modifiable risk factors.[2] With a plethora of diet and nutrition information available online, it is important to understand which sources this population use and trust.
METHODS
This quantitative, cross-sectional, exploratory study used an online questionnaire to gather data from adults, aged 18-35, in relation to the nutrition sources and advice that they access, use and trust. A combination of dichotomous, scale, multiple-choice, and open-ended questions were used for data collection. Frequencies and percentages were calculated.
RESULTS
A total of 162 people participated, of which 75% were female. Over 90% spoke English at home, 70% were aged 25-35, and just over 80% were university educated. Google search RESULTS were the most frequently reported source used in the past for nutrition information and advice (*n*=111, 69%), followed by doctors/GPs (*n*=101, 62%), family (*n*=81, 50%) social media (*n*=79, 49%) and friends (*n*=68, 42%). Google searches were the most likely source to be used in the future (*n*=130, 80%) for nutrition information, followed by professional organisations (*n*=106, 65%), and dietitians (*n*=95, 59%). Nearly 90% reported that it is easy to access nutrition information (*n*=142). Google searches were reported as the easiest to access (*n*= 153, 94%), followed by social media (*n*=148, 91%). Just under two thirds were confident they could determine if a nutrition source was trustworthy (*n*=105, 65%) and 70% reported knowing what a trustworthy nutrition source looks like (*n*=115, 71%). The most trusted nutrition sources were dietitians (*n*=55, 34%), doctors/GPs (*n*=32, 20%), then nutritionists (*n*=31, 19%), but barriers to access (reported via an open-ended question) included cost, time for appointments, and source availability.
CONCLUSIONS
The internet was reported as the leading source of nutrition information and advice for adults aged 18-35. It was also the easiest source to access. With Google search RESULTS now including AI-generated information, it is an important next step to further understand if this population use and trust AI for nutrition information. Nutrition professionals and doctors were most trusted but there were barriers to access. It is therefore vital that evidence-based nutrition information and advice is readily available online and that barriers impeding access to trusted nutrition professionals are addressed for young adults.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_491

DYNAMICS OF GROWTH TRANSITIONS OF CHILDREN IN BANGLADESH: FINDINGS FROM A NATIONWIDE NUTRITION PANEL STUDY

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BACKGROUND AND OBJECTIVES

Similar to many other lower- and middle-income countries, Bangladesh is also facing the double burden of child malnutrition. The objective of this study was to report temporal changes in nutritional status and determinants of the changes.

METHODS

We analyzed paired data of 3,005 children collected in 2018-19 and 2023 from 90 sentinel surveillance sites distributed in the rural, non-slum urban and slum areas of eight administrative division of Bangladesh. The data included household characteristics, parents' characteristics, child characteristics and anthropometric variables. We carried out descriptive and linear mixed effects regression (LMER) analyses. The outcome variables for LMER were height for age Z score (HAZ), weight for age Z score (WAZ), and body-mass-index for age Z score (BAZ).

RESULTS

Overall, 78% of children who were underweight in 2018-19, remained underweight in 2023. In the case of normal weight children, 66% children remained normal weight, but 29% children also became underweight in 2023. The majority of the overweight (76%) and obese (60%) children transitioned to normal weight. Between 2018-19 and 2023, there was a significant increase in HAZ score (0.34 units, $p<0.001$) and a significant decrease in BAZ (-0.16 units, $p=0.011$) but WAZ score remained unchanged. Higher maternal and paternal education, residence in the non-slum urban areas were positively associated with all three outcomes; and residence in Chattogram and Sylhet division were negatively associated with all three outcomes. Moreover, frequency of processed food consumption, belonging to moderate or severe food insecure households had negative association with HAZ; age of the children and childhood morbidity were negatively associated with both WAZ and BAZ; and higher wealth status had positive association with HAZ and WAZ.

CONCLUSIONS

All these findings call for short- and long-term programmatic and policy interventions to further improve the nutritional status of the children in Bangladesh. The short-term interventions can be targeted towards reduction of processed food consumption, prevention and control of childhood morbidity, and reduction of food insecurity, while the long-term intervention should focus on further improvement of both maternal and paternal education and adoption of macro-economic policies to enhance the wealth status of the households.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_492

SIMULATION OF THE FRUIT AND VEGETABLE INTAKES REQUIRED FOR MEETING THE DIETARY REFERENCE INTAKES OF JAPANESE ADULTS: DATA FROM THE 2019 NATIONAL HEALTH AND NUTRITION SURVEY

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BACKGROUND AND OBJECTIVES
Fruit and vegetable intake has been associated with a reduced risk of noncommunicable diseases. Therefore, it is necessary to consider fruit and vegetable target amounts that can reduce disease risk and provide adequate nutrient intake. This study aimed to estimate the amount of fruit and vegetable intake necessary to meet the reference values of “the Dietary Reference Intakes for the Japanese (DRIs)” for selected nutrients using the 2019 National Health and Nutrition Survey (NHNS).
METHODS
We used data from 4927 Japanese adults aged 20 years and over who participated in the dietary survey in the 2019 NHNS. Dietary intake data was were obtained from one-day semi-weighed household dietary records. Nine scenarios (70-90% of Japanese adults consuming between 100 g and 200 g of fruit, based on the current Japanese fruits intake 100g and the previous and current goal of "more than 70% of individuals consuming over 100 g of fruits," and “consuming 200 g of fruits”, respectively) were used to predict the average intake of fruits and vegetables that met the reference values of the DRIs for dietary fibre, vitamin A, folate, and vitamin C as fruits and vegetables are the main sources of these nutrients.
RESULTS
The intake of dietary fibre, vitamin A, folate, and vitamin C from fruits and vegetables constituted approximately 40-70% of the total intake among the participants in the 2019 NHNS. The scenario in which more than 90% of adults consumed 200 g of fruits per day almost met the DRIs reference values for dietary fibre, vitamin A, folate, and vitamin C. Hence, the approximate average fruit and vegetable intakes were found to be 200 g and 350 g, respectively.
CONCLUSIONS
Our scenarios showed that an intake of 200 g of fruits and 350 g of vegetables, which have previously been reported to reduce disease risk, would be sufficient to meet DRIs reference values. Further research is needed to examine policies and interventions to increase fruit and vegetable consumption in the Japanese population.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_497

RELATIONSHIP BETWEEN MEALTIMES AND LIFESTYLE HABITS IN JAPANESE JUNIOR HIGH SCHOOL STUDENTS

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BACKGROUND AND OBJECTIVES

Recently, attention has been focused on the "time" of meals, such as the time when meals start (time of day), eating at roughly the same time (regularity), and whether meals are skipped (frequency). Humans maintain various functions in the body according to circadian rhythms; however disruptions to daily rhythms have been reported in surveys of junior and senior high school students and have been associated with sleep and obesity. Mealtimes have a significant impact on circadian rhythms.

In today's Japanese society, not only adults but also children have busy daily lives, including school, cram school, extracurricular activities, social media use, and long periods of screen time. Many people are aware that their meals (time, regularity, frequency), especially breakfast and dinner, are affected by these activities and would like to improve their use of time.

The purpose of this study was to understand the actual state of mealtimes especially at dinner among junior high school students in Japan and to clarify the relationship lifestyle habits.

METHODS

The participants of this study were 580 boys and girls junior high school students attending two public schools (Schools A and B) in Hiroshima Prefecture, Japan. The survey was conducted anonymously in October 2024 using Google Forms. Permission was obtained from the principal before the survey, and each teacher explained the survey to the participants in writing, online, and verbally. Only those who gave consent were administered the survey (eating at roughly the same time at dinner (regularity), daytime sleepiness, after school activities etc). This study was approved by the Fukuyama University Research Safety and Ethics Committee (approval number: 2024-H-34).

RESULTS

The survey RESULTS showed that 63.1% of School A and 68.6% of School B ate dinner regularly on weekdays, and 74.9% of School A and 75.7% of School B ate dinner regularly on weekends. In addition, those who had regular weekday dinner times also had regular weekday bedtimes and significantly less daytime sleepiness.

CONCLUSIONS

This study clarified the relationship actual mealtimes especially dinner. In the future, we will conduct a detailed survey to clarify the factors affecting mealtimes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_498

IMPROVED DIETARY HABITS OF YOUNG CHILDREN AND FAMILY CONSUMPTION WEEKLY ROUTINES DURING PANDEMIC TIMES

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BACKGROUND AND OBJECTIVES
With the current trends for worsening of the childhood obesity epidemic, unexpected crises as pandemics can additionally affect the nutritional adequacy of the diet of children and their families, increasing the risk for malnutrition. The objective of the current study is to assess the change in the dietary habits of young children and family consumption weekly routines during the COVID-19 pandemic period in Bulgaria.
METHODS
A cross-sectional survey among 7-years-old schoolchildren in Bulgaria was carried out in the spring of 2023 on a nationally representative sample of 3124 students as part of the WHO European Childhood Obesity Surveillance Initiative (COSI). Information on the impact of the COVID-19 pandemic on children's daily habits and behaviours, including dietary patterns and family consumption weekly routines was assessed through voluntary questionnaire, answered for the Pre-COVID-19 period and for the COVID-19 pandemic period by the parents/caregivers of children with response rate 79.6%.
RESULTS
During the COVID-19 pandemic the consumption of fresh fruits increased among 8.2% of the first-graders and decreased among 3.1%, compared to the pre-COVID-19 period. Similar positive changes were observed for vegetables (6.4% increase vs. 2.7% decrease), dairy products (5.5% increase vs. 2.4% decrease); savoury snacks (4.7% increase vs. 7.1% decrease); sweets (4.9% increase vs. 5.4% decrease) and soft drinks containing sugar (1.9% increase vs. 9.7% decrease). The family consumption weekly routines during the COVID-19 pandemic improved for eating home-cooked meals (21.7% increase vs. 1.3% decrease); eating together as a family (19.7% increase vs. 1.2% decrease); cooking meals together with the children (15.1% increase vs. 2.7% decrease); having breakfast (11.6% increase vs. 1.1% decrease); reusing leftovers for another meal (6.8% increase vs. 5.6% decrease); planning purchases and meals in advance (13.9% increase vs. 3.4% decrease) and buying food in large quantities (18.1% increase vs. 9.4% decrease).
CONCLUSIONS
The increased burden of the COVID-19 pandemic period in Bulgaria over the socio-economic status of the families and more time spent at home due to lockdowns and social distancing, actually turned into window of opportunity for the families to more carefully plan their purchase of foods and drinks and meal preparation, leading to improved dietary habits of the children.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_499

U.S. PARENTS' PERCEPTIONS OF THE SAFETY AND HEALTHFULNESS OF NON-SUGAR SWEETENERS FOR CHILDREN

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BACKGROUND AND OBJECTIVES

Non-sugar sweeteners (NSS) are increasingly present in packaged foods and beverages, including in products marketed to children. However, whether NSS are helpful for harmful for weight management and chronic disease prevention is debated. This study assessed U.S. parents' perceptions of the safety and healthfulness of NSS for children, confidence in identifying NSS on product packaging, views on front-of-package label formats highlighting the presence of NSS, and opinions about terminology used to refer to NSS.

METHODS

A total of 1,047 parents of children aged 2–12 years from across the U.S. completed a 31-item survey. The survey included 15 items about general perceptions of NSS, focusing on their healthfulness and safety; 10 items on perceptions of the safety and healthfulness of NSS specifically for children; and 6 items on NSS identification and labeling. Participants responded using 5-point Likert scales ranging from "strongly disagree" to "strongly agree." Additionally, participants were asked to select the most understandable and preferred terms for NSS from a list of terms provided. Descriptive statistics, including means and frequencies, were used to analyze the responses.

RESULTS

Most participants were 30–49 years old (84.9%), 86.9% identified as White, and 11.7% were Hispanic or Latino. Over half (58.1%) of parents believed NSS could help reduce children's sugar intake, yet only 21.9% felt confident that NSS were safe for children to consume daily. Artificial NSS (e.g. aspartame, sucralose) were viewed as less safe for children (26.6% deemed them safe) compared to "natural" NSS such as stevia or monk fruit extract (60.5% deemed them safe). Parents indicated that a front-of-package label for NSS would be helpful, with 92.6% agreeing it would help them identify NSS in products and 44.1% reporting it would decrease their likelihood of providing NSS-containing products to their children. The term artificial sweeteners was the most recognized, with 41.7% of the parents indicating that it was the most understandable compared with other terms including non-sugar sweeteners (24.3%), sugar substitutes (21.8%), or low-calorie sweeteners (5.5%).

CONCLUSIONS

While U.S. parents perceive NSS as useful for reducing sugar intake, they reported concerns about the safety and healthfulness of NSS for children, particularly artificial sweeteners. The findings highlight the potential of front-of-package labels for NSS to help parents make informed choices about giving their children products with NSS.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_500

PREVALENCE OR IRON DEFICIENCY IN WOMEN OF REPRODUCTIVE AGE IN SWITZERLAND: THE ROLE OF INFLAMMATION AND SERUM FERRITIN THRESHOLDS

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BACKGROUND AND OBJECTIVES
Data on the prevalence of iron deficiency in women of reproductive age in Switzerland is scarce. The primary aim of this study was to determine the prevalence of iron deficiency in young women in Switzerland, to determine a physiological threshold for iron deficiency, and to identify factors influencing iron status. Furthermore, we investigated the effect of different correction methods for inflammation on the prevalence of iron deficiency.
METHODS
This is a secondary, pooled data analysis including data from 26 studies conducted in Switzerland between 2009 and 2020. Participants were a convenience sample of generally healthy women aged between 18 and 54 years (n=2709). Serum ferritin, hemoglobin, and C-reactive protein were measured in all participants.
RESULTS
The prevalence of iron deficiency was 18.9%, while 4.7% of the women were anemic and 3.3% were iron deficient anemic. We showed that hemoglobin decreased below a serum ferritin concentration of 28.5 ng/ml. The prevalence of overweight (BMI ≥ 25 kg/m2) was 7.2% and 1.4% were obese (BMI ≥ 30 kg/m2). Acute inflammation (CRP ≥ 5 mg/l) was found in 8.9% of the women. In a multivariate regression analysis, BMI and age were significant positive predictors of serum ferritin, while inflammation was not associated with serum ferritin. Depending on the method used to correct for inflammation, iron deficiency prevalence ranged from 18.9% to 21.3%.
CONCLUSIONS
In this convenience sample of young women in Switzerland, one in five was found to be iron deficient and one in 20 was anemic due to iron deficiency. We have further determined a physiological threshold for iron deficiency at a serum ferritin concentration of 28.5 ng/ml. Controlling serum ferritin concentrations for inflammation did not substantially affect the prevalence of iron deficiency, indicating that such corrections are not necessary in a healthy population with low prevalence of inflammation.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_501

ASSOCIATION BETWEEN ULTRA-PROCESSED FOOD CONSUMPTION AND SYSTEMIC INFLAMMATION IN CHILEAN ADOLESCENT GIRLS DURING PUBERTY

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BACKGROUND AND OBJECTIVES
Ultra-processed foods (UPFs) constitute a substantial portion of global dietary intake and have been linked to chronic diseases, particularly those with inflammatory origins. While high-UPF diets may elevate systemic inflammation (SI) via excess adiposity, evidence suggests that UPFs independently influence SI by producing pro-inflammatory cytokines. This study aimed to evaluate the association between UPF consumption and SI markers—serum ultrasensitive C-reactive protein (PCR), interleukin-6 (IL-6), and tumor necrosis factor receptor 2 (TNFR2)—in Chilean adolescent girls during puberty, while considering the independent effects of body mass index (BMI).
METHODS
We did a longitudinal study using data from a cohort of Chilean girls. UPF consumption was assessed using 24-hour dietary recalls, categorized by the NOVA classification. Serum inflammatory markers were measured (ultrasensitive PCR, IL-6, and TNFR2). We performed multivariable linear regression models between each quartile of UPF (kcal and grams) and each inflammatory marker. Models were adjusted by potential confounders (age, maternal education, menarche, and energy intake from other NOVA food groups). We also analyzed the models independent from BMI z-scores (zBMI).
RESULTS
Data from 244 adolescent girls were analyzed (mean age 11.5 years, SD = 0.7), and 14.5% were classified as obese. More than half (56%) provided two or more dietary recalls. The mean total energy intake was 1899 kcal (SD = 585), with UPFs contributing 42% of kcal and 38% of consumed grams. Median levels of inflammatory markers were PCR: 0.5 mg/L (IQR: 0.2–2.0), IL-6: 1.2 pg/mL (IQR: 0.8–2.1), and TNFR2: 2245 pg/mL (IQR: 1920–2532). No consistent associations were found between UPF consumption and PCR or IL-6 levels. However, a significant negative association was observed between UPF consumption (grams) and TNFR2 in the third quartile after adjusting for zBMI (β = -203.8; 95% CI, -402.3 to -5.3; $p < 0.05$). Positive correlations were noted between adiposity indicators (zBMI, waist circumference, % body fat) and all SI markers.
CONCLUSIONS
In this cohort of Chilean adolescent girls, UPF intake was not consistently associated with SI markers during puberty. The observed negative association between UPF intake and TNFR2 warrants further investigation. Longitudinal studies are necessary to explore the long-term effects of UPF consumption on inflammation and related health outcomes during critical developmental stages.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_502

RIPPLE EFFECTS OF THE ARIGATO (GRATITUDE) RECIPE BOOK DEVELOPED IN DISASTER-AFFECTED AREAS: A SUSTAINABLE APPROACH TO COMMUNITY SUPPORT THAT CONNECTS MENTAL AND PHYSICAL HEALTH

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BACKGROUND AND OBJECTIVES
In October 2011, the Ajinomoto Foundation (TAF) launched the Red Apron Project to support residents affected by the Great East Japan Earthquake. The project aimed to improve nutrition and revitalize communities through cooking classes. To address disaster victims'health issues and weakened community bonds, TAF held 3,771 cooking classes with 54,434 participants over 8.5 years. In 2021, TAF published the "ARIGATO (Gratitude) Recipe Collection" to thank stakeholders and support independent local efforts. Featuring 109 recipes and tips for cooking classes, the book focuses on nutritional balance, ease of preparation, and accessible ingredients, and is tailored to temporary housing kitchens. Over 80,000 copies were distributed. This study examines the diffusion process and success factors of the recipe book and its potential as a sustainable community support model.
METHODS
In December 2022, an anonymous web-based survey was conducted with 213 stakeholders, including government officials, educators, and other supporters. Demographic data were collected, the book's usefulness assessed on a 1-to-5 scale (5 = most useful), and diffusion evaluated using five factors from the diffusion of innovation theory.
RESULTS
A total of 115 respondents participated in the survey, yielding a 54% response rate. Among them, 41 respondents ("implementers") conducted cooking classes using the "ARIGATO Recipe Book," while 74 ("nonimplementers") did not. Both groups rated the book's seven chapters highly(average scores exceeding 4.0), with no significant differences between them. Implementers valued the book for its usefulness in selecting recipes, ensuring sanitation, planning classes, and preparing ingredients. According to the diffusion of innovation theory, the booksucceeded due to its "relative advantage," addressing disaster victims' physical and mental health needs while accommodating their constraints. The book was also characterized by "low complexity," with simple recipes suitable for disaster-stricken areas.
CONCLUSIONS
The "ARIGATO Recipe Book" is considered a versatile and practical tool for improving nutrition and revitalizing local communities. The reason for this success could be that the content that places emphasis on the quality of life of the victims is compatible with the diverse needs of society. This study highlights the potential of recipe books as central components of sustainable community support models and long-term solutions for other regions.

CONFLICTS OF INTERESTS
Yuri Kinoshita(The Ajinomoto Foundation, Commissioned research funding)

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EPO5_503

COMPARATIVE ANALYSIS OF LIPIDS IN AN INFANT FORMULA CONTAINING A BLEND OF DAIRY AND PLANT-BASED LIPIDS VERSUS A FORMULA EXCLUSIVELY USING PLANT-BASED LIPIDS

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BACKGROUND AND OBJECTIVES
Breast milk is the nutritional gold standard, known for its rich and complex lipid composition, which includes a wide variety of fatty acids, phospholipids, gangliosides, and cholesterol. These lipids play a crucial role in infant development, contributing to optimal growth, immune function, and cognitive development. However, replicating this complexity in infant formulas (IFs) remains a significant challenge. Dairy lipids are recognized for their diversity and combining them with plant-based lipid sources could improve the lipid profile of IFs. This study aims to compare the lipid composition of an IF containing a blend of dairy and plant-based lipids with that of an IF made exclusively from plant-based oils.
METHODS
Three IFs with different lipid sources were analyzed: an IF containing a blend of dairy and plant-based lipids (DL-IF) and two IFs made exclusively with plant-based oils (P-IF1 and P-IF2). Lipid components, including fatty acid profiles and bioactive lipids such as phospholipids and gangliosides, were analyzed. Cholesterol was quantified by gas chromatography following thin-layer chromatography separation. Fatty acid profiles were assessed using gas chromatography of fatty acid methyl esters. Phospholipids and gangliosides were analyzed by high-performance liquid chromatography (HPLC), with gangliosides quantified by HPLC coupled with mass spectrometry. Sn-2 palmitic acid content was determined via enzymatic hydrolysis.
RESULTS
The DL-IF contained 26.3 g of lipids/100 g of powder, P-IF1 contained 24.8 g of lipids/100 g of powder, and P-IF2 contained 27.5 g of lipids/100 g of powder. The DL-IF had a higher proportion of palmitic acid compared to P-IF1 and P-IF2 (19 g/100 g total fat vs. 7 g/100 g and 6 g/100 g, respectively). The sn-2 palmitic acid proportion in DL-IF was 33% (of total palmitic acid), compared to 6% in P-IF1 and 5% in P-IF2.
CONCLUSIONS
This study highlights the importance of lipid sources in infant formula. Combining dairy and plant-based lipids offers unique benefits compared to plant-only formulations, providing a more complex and diverse fatty acid profile. Preliminary RESULTS indicate that the composition and palmitic acid profile of DL-IF are closer to those of breast milk, which contains 17–25% palmitic acid in total fatty acids (1), with approximately 70% in the sn-2 position (2). Incorporating dairy lipids into IFs may help approach the composition of breast milk, optimizing infant nutrition products to better support overall infant health and development.
CONFLICTS OF INTERESTS
Lactalis

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EPO5_506

VIRTUAL COMMUNICATION ON INFANT NUTRITION VIA SOCIAL MEDIA

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BACKGROUND AND OBJECTIVES
Instagram has been considered an effective platform for disseminating information, influencing the choices and decisions of those responsible for children's nutrition. Considering this model of knowledge transmission, the objectives of this project are:

1. To create a virtual communication network that enables the dissemination of reliable information on child health and nutrition.
2. To use Instagram to share evidence-based information on infant nutrition.
3. To present healthy recipe options that contribute to improving children's nutrition.

METHODS
Adapt scientific information to an accessible language for the target audience (caregivers and children), by using visual resources such as images and clear text to ensure better understanding. Create posts based on scientific evidence of healthy eating habits, physical activity, and children's nutrition, providing accurate and reliable guidance. Additionally, develop posts featuring healthy and appealing recipes, especially aimed at children, in order to encourage more balanced and flavorful eating habits.
RESULTS
Creation of the Instagram account @ateliedaalimentacao.usp, which includes posts on healthy recipes, physical activity, ultra-processed foods, and breastfeeding. Currently, the account has 233 followers and has reached 430 profiles.
CONCLUSIONS
Using Instagram to disseminate information on infant nutrition has demonstrated its potential in reaching a significant audience. By adapting scientific content to an accessible and visually attractive language, it was possible to engage followers and share essential information on nutrition. With 233 followers and 430 profiles reached, the project highlights the platform’s potential to encourage changes concerning children's eating behaviors.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_507

WHICH FOOD GROUPS MAKE UP SCHOOL MEALS IN BRAZIL? AN EVALUATION OF MENUS FROM THE NATIONAL SCHOOL FOOD PROGRAM (PNAE)

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BACKGROUND AND OBJECTIVES

The National School Feeding Program (PNAE) is the oldest and most significant public policy in Brazil aimed at promoting the right to food for students in basic education [1, 2]. It is recognized as a global reference for its efforts to promote healthy eating combined with sustainability [3]. The program advocates for the provision of fresh and minimally processed foods as the foundation of meals and restricts the procurement of processed and ultra-processed foods, aiming to promote adequate and healthy eating [4]. This study aimed to evaluate school menus and determine the weekly frequency of food groups present in Brazilian school menus.

METHODS

This quantitative, cross-sectional study used data from the project "School meal menu patterns and their relationship with nutritional quality and sociodemographic factor". A sample of 557 weekly menus (five days) from elementary schools across Brazilian municipalities was assessed. Data were collected between 2022 and 2024 and subjected to descriptive and exploratory analysis.

RESULTS

Cereals and tubers were present five times per week in 52.06% of the evaluated school menus, while legumes appeared from one to two times per week in 47.04%, with rice and beans being the most common items in these groups. Vegetables occurred at least three times per week in 69.30% of the menus, while fruits were offered two to three times per week in 51,71% of the menus. Red meat was served two to three times per week in 62.30% of municipalities, while eggs, poultry, and fish appeared one to two times per week in 68.94%. Dairy products were served one to two times per week in 53.50% of the menus but were absent in 41.47% of municipalities. Processed foods were not included on any day in 53.68% of the menus, while ultra-processed foods appeared one to two times per week in 60.14% of the menus analyzed. Additionally, 78.28% of municipalities did not include sociobiodiversity foods on any day of the week, and regional foods were included only one to two times per week in 53.86% of the menus.

CONCLUSIONS

Fresh and minimally processed foods were prevalent; however, ultra-processed foods remain frequent, while sociobiodiversity and regional foods are still underrepresented. These findings indicate that despite the advances achieved by the PNAE, further improvements in menu planning are necessary.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_508

THE ROLE OF THE DIETITIAN IN THE SOCIAL ASSISTANCE SYSTEM

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BACKGROUND AND OBJECTIVES
In Brazil, social assistance has been organized since 2003 through the Unified Social Assistance System (SUAS), which aims to promote social protection and guarantee the rights of vulnerable families and individuals. Although food is a constitutional right, hunger and food insecurity are still persistent challenges. Within this context, the role of dietitian in the social assistance network contributes to the realization of the human right to adequate food and the fight against malnutrition in all its forms, aligned with current recommendations. However, there is an absence of recognized guidelines regarding social assistance teams. This study aims to understand the work processes of dietitians in the SUAS, based on a dialogical approach that can strengthen the presence of these professionals in the social assistance network throughout Brazil.
METHODS
This is a prospective study with a qualitative, descriptive and analytical approach. The sample consisted of 15 dietitians working in social assistance, selected through electronic invitations. The interviews were conducted using a semi-structured script so as to allow content analysis according to established thematic nuclei.
RESULTS
The interviews conducted enabled information to be gathered on the daily practices and challenges faced by dietitians. The professionals emphasized the importance of sensitizing the teams to the transversality of the human right to food. They also identified weaknesses in Food and Nutrition Education actions and difficulties in intersectoral coordination. Additionally, they emphasize the need to strengthen social control spaces in municipalities. This would help to guarantee the continuity of initiatives, even with the change of governments and/or professional teams. In addition, there is a growing articulation between dietitians, public managers and researchers, with the development of programs, actions and research aimed at rebuilding the public food and nutrition agenda in the SUAS.
CONCLUSIONS
Efforts to consolidate the role of dietitians in social assistance are gaining momentum, resulting in positive outcomes such as promoting healthy eating practices, tackling food insecurity, and realizing food-related rights The continuity and expansion of these actions depend on the integration between different sectors, the strengthening of social control and collective engagement, as resources in the fight against hunger and the promotion of adequate and healthy food.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_511

DEVELOPMENT, VALIDITY AND REPRODUCIBILITY OF A SEMI-QUANTITATIVE FOOD FREQUENCY QUESTIONNAIRE FOR USE AMONG THE ADULT POPULATION IN REUNION ISLAND

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BACKGROUND AND OBJECTIVES
Despite the urgency regarding increasing prevalence of obesity and chronic diseases in Reunion island, data on eating habits and nutritional intakes to characterise this nutritional transition remains scarce and incomplete. One of the scientific challenges of the Comportements Alimentaires à la RéunIon (CARI) observatory is to develop and validate methodologies adapted to the Reunionese context to obtain robust and reliable data. The aims of the study were: (i) to describe the development of a semiquantitative food frequency questionnaire (FFQ) for use among the adult population in Reunion island to measure usual food intakes during the past month; (ii) to assess its reproducibility; and (iii) to assess its relative validity compared with self-administered web-based 24-hour dietary recalls (DRs).
METHODS
The layout and format of the CARI FFQ was based on the French FFQ of the Nutrinet study but the food list was adapted to better reflect dietary practices and nutritional challenges on Reunion Island, with the support of a local dietician and import and agricultural production data. The CARI FFQ was administered twice to 108 purposively selected adults in Reunion Island, 4 weeks apart, from March to May 2024, to determine its reproducibility. Participants were asked to complete a weekly DR over the same period to determine the FFQ's validity. Both FFQ and DRs were administered by 7 trained dieticians and answers were entered directly onto a tablet on the NutriNet-Santé study platform. Several measures of reproducibility and validity were evaluated: estimations of 18 food groups, energy, and 38 nutrient intakes from the DRs and the FFQ, rank correlation and cross-classification.
RESULTS
Regarding validity tests, we found a median rank correlation of 0·51 (from 0.27 to 0·68) for nutrients and 0·43 (from -0.02 to 0·71) for food groups. Most participants were correctly classified into the same or adjacent quintile (median of 71% for nutrients and 68% for food group) while the median percentage of gross misclassification was low (1.8% for nutrients and 0.9% for food groups). Regarding reproducibility tests, we found a median rank correlation of 0·55 (from 0.16 to 0·70) for nutrients and 0·64 (from 0.41 to 0·83) for food groups. Most participants were correctly classified into the same or adjacent quintile (median of 80% for nutrients and 83% for food group) while the median percentage of gross misclassification was low (2.7% for nutrients and 0.9% for food groups).
CONCLUSIONS
The CARI FFQ demonstrated a moderate to good level of validity for ranking food and nutrient intakes within an adult population in Reunion, and a good level of reproducibility.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_512

THE HEALTH BENEFITS AND COST-EFFECTIVENESS OF A SUGAR-SWEETENED BEVERAGE TAX FOR NEW ZEALAND YOUTH

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BACKGROUND AND OBJECTIVES
Sugar-sweetened beverage (SSB) intake is associated with dental caries, diabetes, and obesity. New Zealand (NZ) has the second highest prevalence of childhood obesity among OECD countries and poor nutritional intake, including consumption of SSBs, is an important contributor. Significant inequities in SSB intake and obesity exist by ethnicity and socioeconomic status. SSB taxes have been shown to be effective and are recommended by health bodies such as the WHO. This study modelled the potential health and equity impacts and cost-effectiveness of an SSB tax implemented in NZ, focusing on outcomes for youth.
METHODS
We modelled the effect of a range of SSB taxes on consumption of SSBs, other dietary risk factors, and body mass index in youth aged 2-19 over their lifetimes. Baseline dietary intake was obtained from the NZ National Children's and Adult's Nutrition Surveys, and changes in consumption were estimated using a matrix of NZ price elasticities. A proportional multistate life table model was used to predict the change in incidence of nutrition-related communicable diseases in both childhood and adulthood, disutility associated with childhood overweight and obesity, quality-adjusted life years (QALYs), and healthcare system costs (2011 NZ$) over the lifespan of the NZ population alive in 2011 (3% discounting). Scenario analyses considered SSB tax levels of 10% and 20% and a range of SSB definitions.
RESULTS
In the total NZ population, a 20% tax on SSBs (soft drinks only) generated 133,470 QALYs (95% uncertainty interval (UI): 109,860 to 160,160) and saved $2,530 million (95% UI: 1,950 to 3,200) in healthcare expenditure over the life course of the cohort. Age-standardised per capita health gains were 2.9 times greater for Māori than non-Māori youth. The tax prevented 60,900 and 210 lifetime incident cases of dental caries and type 2 diabetes in youth. Health gains generated in the NZ youth population ranged from 72,070 QALYs (95% UI: 58,950 to 86,610) for a 10% tax on sugar-sweetened soft drinks to 192,430 QALYs (95% UI: 159,300 to 230,990) for a 20% tax on sugar-sweetened soft drinks, fruit juices, and fruit, energy, and sports drinks. The respective healthcare-system cost savings ranged from $1,340 million (95% UI: 1,040 to 1,700) to $3,620 million (95% UI: 2,820 to 4,530).
CONCLUSIONS
This study showed that an SSB tax implemented in NZ would result in substantial health system cost-savings and improve health and health equity for Māori. This policy could be an effective component of a population-level strategy to improve nutrition and health.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_515

THE RELATIONSHIP BETWEEN TRADITIONAL JAPANESE DIET SCORE AND BONE HEALTH: AN ECOLOGICAL STUDY

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BACKGROUND AND OBJECTIVES
The traditional Japanese diet is thought to be related to the longevity of the Japanese people. We have calculated traditional Japanese diet score (TJDS) using foods commonly eaten around the world, and we have reported that TJDS was positivity associated with healthy life expectancy and negatively associated with incidence and mortality of certain non-communicable diseases in ecological studies. On the other hand, traditional Japanese diet is considered to be lacking in calcium and not very good for bone health. The purpose of this study is to clarify the global association between TJDS and bone health indicators through a longitudinal analysis using data from 2010 to 2021.
METHODS
Low bone mineral density rate (LBMD) and bone mineral density among population age 60 and over years (BMD60) were used as indicators of bone health. Data on food supply, LBMD, BMD60, and covariables by country were obtained from a relevant internationally available database. TJDS by country was calculated from eight food groups and the total score ranged from -8 to 8, with higher scores indicating greater adherence to a traditional Japanese diet. We evaluated the longitudinal association between TJDS and LBMD, BMD60 using 2010-2021 in 144 countries with populations of more than one million. A longitudinal analysis was performed using linear mixed models controlling for covariates. The natural logarithms of LBMD and BMD60 were used as the dependent variables, and the risk ratio (RR) was calculated from the difference in the logarithms of TJDS.
RESULTS
The fixed effects (standard error) of TJDS on LBMD and BMD60 were 0.015 (0.004), $p<0.001$, -0.004 (0.001), $p= 0.007$, respectively. When TJDS was -6, the RR for LBMD and BMD60 were 0.912 (0.870-0.956) and 1.023 (1.007-1.040), and when TJDS was 6, the RR for LBM and BMD60 were 1.097 (1.046-1.150) and 0.977 (0.961-0.993), respectively.
CONCLUSIONS
This longitudinal ecological study suggests that traditional Japanese diet is associated with high LBMD and low BMD60, worldwide.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_517

PREVALENCE OF MALNUTRITION AND CHILDHOOD ANEMIA IN A NON-GOVERNMENTAL NUTRITION PROGRAM

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BACKGROUND AND OBJECTIVES
According to the World Health Organization (WHO), child malnutrition due to deficits remains a persistent global public health issue. Recent estimates indicate that 6.7% of preschool-aged children suffer from wasting, 22% from stunting, and 40% from anemia. In Mexico, 3.9% of children have low weight, 1.2% suffer from wasting, 13.9% from stunting, and 9.4% from anemia. This study aimed to determine the prevalence of nutritional status and anemia in preschoolers participating in a non-governmental nutrition program.
METHODS
Weight, height, and capillary hemoglobin [HbC] were measured based on recommended techniques in 17,520 preschoolers participating in community activities proposed by Un Kilo de Ayuda. To classify nutritional status and HbC concentration, the indicators, values, and cut-off points established by the WHO were used. Prevalence rates and confidence intervals were calculated for nutritional status categories, and frequencies, percentages, and chi-square tests were used for group comparisons.
RESULTS
The gender distribution was 50.3% boys and 49.7% girls. The prevalence of wasting was 1.8% (95% CI: 1.4, 2.4), stunting 29.2% (95% CI: 14.5, 50.2), and low weight 9.3% (95% CI: 5.8, 14.6). When stratified by gender, wasting was 2.2% (95% CI: 1.7, 2.8) in boys and 1.5% (95% CI: 1.1, 2.1) in girls. Stunting was higher in boys (30.1% [95% CI: 15, 51.2]) compared to girls (28.4% [95% CI: 14, 49.1]). Low weight was also higher in boys (9.7% [95% CI: 6.3, 14.7]) versus girls (8.9% [95% CI: 5.3, 14.7]). The overall prevalence of anemia was 23.4% (95% CI: 22.7, 24), with 23.7% (95% CI: 22.8, 24.6) in boys and 23% (95% CI: 22.1, 23.9) in girls. A significant association was observed between nutritional status and anemia: wasting ($p<0.001$), stunting ($p<0.05$), and low weight ($p<0.001$).
CONCLUSIONS
The various forms of malnutrition in preschoolers continue to pose a significant health challenge, jeopardizing early childhood development and increasing morbidity and mortality in later life stages. This, in turn, reduces the potential for personal and economic development in affected countries. Non-governmental programs represent an effective strategy for monitoring and improving the nutritional and health status of preschoolers. Furthermore, the community actions proposed by these programs can inform the design of nutrition policies and programs.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_519

MULTIVARIATE ANALYSIS OF THE INFLUENCE OF MUSCLE CONDITION AND ESTIMATED PROTEIN INTAKE ON THE AMINO ACID LEVELS IN SMALL VOLUMES OF CALF SWEAT IN OLDER ADULTS

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BACKGROUND AND OBJECTIVES

Sarcopenia is the progressive loss of muscle mass and function in older adults. Aging is the most prevalent cause of sarcopenia; however, physical inactivity and malnutrition worsen sarcopenia. Protein–energy malnutrition is frequently assessed from biomarkers in serum, but blood collection is painful and burdensome for the patient. Therefore, we focused on human sweat, which is a component produced from blood plasma, which can be collected noninvasively. Amino acids are quantified from very small samples of sweat collected at rest using high-performance liquid chromatography (HPLC) (Tsunoda M *et al*, 2024). This study aimed to identify the association between sweat amino acid levels and muscle status and estimated protein intake and to investigate the effectiveness of sweat amino acid analysis as a risk assessment tool for sarcopenia.

METHODS

The subjects included 146 community-dwelling older adults (34 males and 112 females) aged 60–92 years.

- Sweat was collected by applying a medical patch to the calves for 3 min in the sitting position. The amino acid content in the sweat was analyzed by HPLC.
- Physical measurements were conducted, including body composition, calf circumference (CC), grip strength, and walking speed.
- Diet surveys were conducted using a brief-type self-administered diet history questionnaire (BDHQ) to identify the frequency of food intake and estimated nutrient intake.
- Self-administered paper questionnaires, such as the Japanese version of the Cardiovascular Health Study (J-CHS) criteria, were conducted.

RESULTS

HPLC quantified 13 amino acids in the sweat of calves. The multiple regression analysis revealed a positive association between the estimated protein intake identified by BDHQ and arginine levels in sweat. The glutamic acid level in sweat was negatively associated with the J-CHS score and positively associated with CC.

CONCLUSIONS

Several amino acids in calf sweat may reflect muscle condition and estimated protein intake, indicating potential application in reliable risk assessment of sarcopenia.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_520

NUTRITIONAL ASSESSMENT OF CHILDREN IN RURAL CAMBODIA: ASSESSMENT USING THE MINIMUM DIETARY DIVERSITY FOR WOMEN IN CHILDREN AGED 24–59 MONTHS

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BACKGROUND AND OBJECTIVES

Chronic malnutrition among children <5 years is a global issue. Rates of stunting and wasting are particularly high in rural Cambodia (1-3). In low-income countries, while standard indicators for children aged 6–23 months (4) exist, there are no established indicators for children aged 24–59 months. Thus, we aimed to assess the minimum dietary diversity (MDD) and explore factors contributing to malnutrition among children aged 24–59 months in rural Cambodia. We also aimed to identify key determinants related to children's nutritional status and provide recommendations for nutritional improvements.

METHODS

The target area covered four of the seven counties in the province of Preah Vihear. A baseline survey (random sampling method, 123 participants) was conducted, and 40 children under 5 years of age who were determined to be at high risk of wasting, stunting, and being underweight were selected. In February 2024, the caregivers kept dietary records for three days (using food records, photographs, interviews). Children aged 24–59 months were evaluated using the MDD for Women (MDD-W) guidelines (5), assessing the intake of 10 or additional food groups, as well as food intake frequency.

RESULTS

Data from 26 children (13 boys) over a total of 55 days were analyzed to calculate the MDD-W. The recommended intake of 5 or more food groups per day was achieved in 18 days (32.7%), with 12 children (46.2%) meeting this criterion. The minimum number of food groups consumed was 2, the maximum was 9, and the mode was 4. The most-consumed food group was "Grains, etc.," followed by "Meat, etc." The least-consumed food groups were "Nuts, etc." and "Milk, etc." Additionally, the intake of unhealthy food groups not included in the MDD-W, such as snacks and instant noodles, was frequently observed in the 30 days' worth of meal records collected from 18 children. In terms of meal frequency, 22 children had 4 or more meals per day.

CONCLUSIONS

The MDD, typically used for children aged 6–23 months, does not cover children aged 24 months and older. By adapting the MDD-W for children aged 24–59 months, we found that the intake of mineral-rich food groups was low, and the frequency of consuming unhealthy food groups was high. Future studies should explore how these findings relate to nutrient Recommended Dietary Allowance, malnutrition indicators, and differences based on caregivers' educational backgrounds and residential areas.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_521

KNOWLEDGE ON THE SAFETY AND QUALITY OF DRINKING WATER AMONG HEALTHCARE PROFESSIONALS

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BACKGROUND AND OBJECTIVES

Water has very diverse benefits for the body. Drinking water needs to be considered for its safety and quality, as it may impact health as infectious diseases and NCDs. Healthcare (HC) professionals' knowledge on the safety and quality of drinking water is important because they are educators and role models in society. This research aims to evaluate health professionals' level of knowledge about drinking water's safety and quality.

METHODS

A cross-sectional study with a population of HC professionals taking part in a conference in Jakarta and coming from various regions in Indonesia. The sample was the entire population who were willing to participate. Subjects fill out a questionnaire regarding demographics, drinking habits, and knowledge.

RESULTS

One hundred thirty-one subjects joined the study, 14.5% were male, and 82.4% were from Java Island. Age distribution between >35 years old and ≤35 years old were almost the same, 53.4% and 46.6% respectively. This study shows that only 19.1% of the subjects had good knowledge, while 51.9% fair and 29.0% low. There was no significant difference in the level of knowledge between specialist doctors, GPs, or dieticians. These RESULTS mean that healthcare professionals need further education about the safety and quality of drinking water. We found that the three most false answers from the 10 questions were about the requirements of good drinking water, how contamination can harm health, and what diseases may result from consuming contaminated water.

CONCLUSIONS

HC professional's knowledge of drinking water safety and quality must be enhanced.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_522

ADHERENCE TO DIET RECOMMENDATIONS IN WOMEN WITH GESTATIONAL DIABETES MELLITUS

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BACKGROUND AND OBJECTIVES
Gestational diabetes mellitus (GDM) is a common disorder of glucose metabolism that is detected for the first time in pregnancy. The main risk factor for GDM is obesity. GDM may compromise the health of both the mother and the child, and thus blood glucose levels are controlled by lifestyle modifications including diet and physical activity. The objective was to investigate the adherence to the dietary recommendations of women with GDM.
METHODS
Women with prepregnancy overweight (BMI≥25) or obesity (BMI≥30) were studied. Dietary intake was assessed from 3-day food-diaries with nutrient intakes calculated and compared to dietary recommendations. GDM was diagnosed with a 2-hour oral glucose tolerance test. Altogether 98 women with GDM and 251 pregnant women without GDM were studied.
RESULTS
Of the women with GDM 51% adhered to recommendations for carbohydrate intake, 54% for total fat and 69% for sucrose intake, whilst only 16% adhered to the protein and 4% to fibre intake recommendations. Women with GDM had lower adherence to protein, total fat and fibre recommendations but higher adherence to that of sucrose than women without GDM.
CONCLUSIONS
Adherence to dietary recommendations, particularly fibre and protein intake, is unsatisfactory in women with GDM.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_523

PLANT-BASED EATING THROUGH A CULTURAL LENS: A DIETARY INTERVENTION FOR AFRICAN AMERICANS

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BACKGROUND AND OBJECTIVES
Plant-based diets have been linked to a reduced risk of chronic diseases. However, there is limited data on their receptivity and effectiveness within African American populations. This study evaluated the feasibility and efficacy of a culturally tailored plant-based dietary intervention among African Americans.
METHODS
A quasi-experimental pilot study was conducted over 12 weeks, including a 6-week intervention phase with 1 session per week (nutrition education, healthy eating activities, and cooking demonstrations) followed by a 6-week follow-up period without an intervention. Weekly 75-minute sessions were guided by the curriculum, *A Taste of African Heritage [Oldways]*. The curriculum emphasized plant-based foods and healthy lifestyle practices inspired by the traditions of the African Diaspora. Feasibility was assessed through participant recruitment and retention, and session attendance, engagement, and satisfaction. Additional outcomes included cooking frequency, food group intake, exercise, and attitudes toward a plant-based diet via surveys at baseline (week 0), post-intervention (week 6), and follow-up (week 12).
RESULTS
Participants (n=20) self-identified as African American, with a mean age of 62.1 ± 14.7 (Mean ± SD) years and mean body mass index of 34.3 ± 6.5 kg/m². The intervention had a low dropout rate (9%) and high session attendance rate (99%). Participants reported strong engagement, high satisfaction, and noted that the sessions were a good use of their time. All participants agreed that history and heritage motivated healthy eating and living. Mixed-effects models for behavioral changes over time demonstrated significant improvements, including an increase in vegetarian-based meal frequency ($t=3.73$, $p<0.001$) and greater participation in exercise ($t=2.59$, $p=0.013$). There were trends in increasing fruit ($p=0.058$) and vegetable ($p=0.054$) consumption. Perceptions of plant-based diets improved, including attitude towards diet ($t=2.72$, $p<0.01$), perceived benefits of the diet ($t=3.29$, $p<0.01$), and enjoyment and pleasantness of following the diet ($t=2.96$, $p<0.01$).
CONCLUSIONS
The intervention encouraged positive lifestyle behavior changes and improved perceptions of plant-based diets. Incorporating cultural heritage may be a valuable strategy for encouraging plant-based eating among African Americans. However, a controlled trial with a larger sample size is warranted.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_524

STUNTING AMIDST FOOD PLENTY AND WEALTH: A PARADOX

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BACKGROUND AND OBJECTIVES
stunting is a very challenging form of malnutrition to address it with successful outcomes. In Tanzania, prevalence of stunting is high in wealthy and high food production areas and this is a paradox that needs to be unravelled. It is envisaged that causes of stunting. The 2022 DHS report showed that 30% of children below five years of age are stunted, of which 9% are severely stunted. This proportion translates to 2.9 million children. There is wide geophysical disparities of prevalence of stunting. The objective of this analysis was to examine the relationship between food security measured by self sufficiency ratio and wealth index measured as poverty level.
METHODS
nutrition data from the 2022 DHS , production data from the ministry of agriculture and poverty level were analyzed to determine the association between stunting and food security measured in terms of self sufficiency ratio. Similarly, stunting was correlated with wealthy index based on the 2018 Tanzania food and basic poverty data.
RESULTS
When the food SSR was compared with malnutrition stunting rates, it showed that regions that have high SSR also have high stunting rates (correlation coefficient of 0.63). Similarly, the highest prevalence of stunting was observed in Njombe, where the basic need and food poverty were the lowest. This is a paradox and clearly shows that the amount of wealth generated in a region like Njombe is not translated into improved consumption and nutritional status of children. This could be related to inadequate information about consumption of nutritious foods and nutrition of children, but also due to inadequate knowledge on how to translate the generated wealth into improved dietary intake. The ‘paradox’ of high levels of malnutrition in areas with high food crop production can be explained by challenges for mothers and child caretakers to have sufficient time, knowledge/skills, family support and command over resources to meet the needs of children in terms of care, feeding, hygiene and general cleanliness; also stimulation and emotional support and other critical care functions.
CONCLUSIONS
Specific needs and challenges are highly context-specific and, therefore, food security and nutrition interventions and programmes will require formative and operational research to ascertain that all of the critical outcomes for nutrition security are fulfilled, this include household food security, healthy environment and health services as well as care and support knowledge and skills.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_525

ASSESSING THE FOOD ENVIRONMENT IN MALAYSIA: A NARRATIVE REVIEW

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BACKGROUND AND OBJECTIVES
Food environment is a significant determinant of dietary choices and intake, making it a key policy entry point to address malnutrition and the growing prevalence of non-communicable diseases. This review aims to summarise the evidence on food environment characteristics in Malaysia, providing an overview of each dimension and identifying its potential implications for food choices.
METHODS
A literature search was conducted to identify English-language publications and grey literature. Sources were analysed and synthesised to describe Malaysian food environments in five dimensions: food availability, food affordability, food properties, vendor properties, and food messaging.
RESULTS
Malaysia has been increasingly reliance on imports for food supply. With that, the import of unhealthy food has also risen. Since 1990, the weight of imported ultra-processed, energy-dense and high-fat foods has increased at a compounded annual growth rate of 5.8%, higher than healthier foods (4.9%). The increased consumption of food away from home, commonly associated with higher energy intake and poorer diet quality, also poses additional challenges to healthy eating. This can be reinforced by the increased use of meal delivery apps (MDAs) and food delivery services, which expand access to unhealthy food options. Findings from Grab, a leading MDA in Malaysia, show that deep-fried, high-fat and sugar-sweetened beverages were more frequently searched or ordered on the platform. Meanwhile, the national supply of fruits and vegetables per capita per day consistently falls below the recommended intake level. On the other hand, the cost of a healthy diet in Malaysia has been rising against the backdrop of wage stagnation, recording an increase of 9.2% from 2017 to 2021. Fruits account for the highest share (29%) of the cost of a healthy diet, followed by animal-sourced foods (26%) and vegetables (20%). There is also an established body of evidence that points to the targeting of unhealthy food advertisements on television and YouTube to children through higher advertising rates during children's peak viewing time and on school holidays.
CONCLUSIONS
Evidence suggests that Malaysia's food environments are largely characterised by the increased availability, accessibility and desirability of unhealthy food and the unaffordability of healthier options. This can disproportionately impact people with financial constraints, time-poor individuals, children and adolescents.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_526

EFFECT OF SPORTS NUTRITION MANAGEMENT ON GASTROINTESTINAL HEALTH AND INTESTINAL FLORA IN ATHLETES UNDERGOING INTENSE TRAINING

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BACKGROUND AND OBJECTIVES
In sports nutrition management, a personalized nutritional plan is developed based on assessments of the athlete's training regimen, dietary habits, body composition, and overall health. The goal is to help athletes to achieve specific objectives within a set timeframe while providing ongoing support. Athletes often engage in high-intensity training to improve performance, but prolonged and intense exercise can lead to gastrointestinal discomfort. This study aimed to evaluate the effectiveness of a sports nutrition management program designed for athletes involved in long-duration, high-intensity exercise.
METHODS
Male triathletes, swimmers, long-distance runners, and walkers with gastrointestinal issues were identified through a screening survey and divided into a nutrition intervention group (n=9) and a control group (n=9). The intervention lasted 1 month. Before and after the intervention, saliva, urine, and fecal samples were collected, and participants underwent anthropometric measurements, dietary and physical activity surveys, and physical condition assessments. The intervention group's nutritional management plan was developed based on anthropometric and survey RESULTS to align with individual goals. The plan included consuming 25–30 g/day of dietary fiber and two servings of fermented foods daily to support gastrointestinal health. Counseling sessions were provided three times during the study.
RESULTS
In the intervention group, dietary fiber intake increased to 29.5±2.7 g/day, and fermented food consumption rose to 2.6±1.3 servings/day. The proportion of *Bifidobacterium* increased by 10.0%±6.1%, while the proportion of *Bacteroides* decreased by 10.7%±4.3%. Additionally, the frequency of diarrhea or watery stools decreased in the intervention group.
CONCLUSIONS
The observed increase in Bifidobacterium may have enhanced the intestinal barrier function by breaking down lactose and oligosaccharides and producing organic acids such as butyric acid, contributing to improved gastrointestinal health. These findings imply that athletes may benefit from higher dietary fiber and fermented-food intake compared with the general population to prevent gastrointestinal issues associated with intense training. This study supports an intake of 25–30 g/day of dietary fiber and two or more servings of fermented foods daily as effective targets for sports nutrition management to regulate gastrointestinal health.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_527

CHANGES IN INTESTINAL MICROBIOTA DURING THE TRAINING PERIOD IN COLLEGE MALE LONG-DISTANCE ATHLETES

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BACKGROUND AND OBJECTIVES
Probiotics, such as *Lactobacillus* and *Bifidobacterium*, have been shown to improve the intestinal environment and to have immunomodulatory effects. Athletes are often exposed to intense training and stress, and conditioning methods based on nutritional management with probiotics are attracting attention. Therefore, this study investigated changes in nutrient intake and intestinal microflora in track and field athletes, a sport that often causes abdominal pain, to examine how athletes eat and manage their physical condition within their yearly schedule.
METHODS
Body composition measurements and faecal microflora tests were conducted twice during the competition season (periods I and II) and once during the off-season (off-period) in six male university track and field long-distance athletes. In addition, a TDMS-based survey on mood on the day of the study, questionnaires on physical condition and abdominal condition, and a three-day dietary survey were conducted. Physical activity during the study period was assessed in terms of distance run. The faecal intestinal microbiota was examined by next-generation sequencing and amplicon analysis.
RESULTS
Dietary intake of protein, calcium, iron and vitamins C and D increased significantly in competition periods II, while energy intake and other nutrients did not change significantly. At the phylum and genus level, no significant changes in the composition of the intestinal microbiota of the six participants during competition periods I, II and the off-period were observed. In addition, no period-specific clusters were formed in the composition of the intestinal flora. However, the composition of *Bifidobacterium* spp. showed a negative correlation ($p<0.05$, $r=0.829$) with monthly running distance in competition period II and a positive correlation ($p<0.05$, $r=0.886$) with soluble fibre intake in the off period.
CONCLUSIONS
Changes in the intestinal microbiota were not clearly influenced by the course of the long-distance runners' yearly schedule or by psychological stress. On the other hand, long-term observations suggested that the amount of physical activity and dietary fibre intake of athletes influenced the composition of the intestinal microbiota.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_528

VALIDATION OF THE CLUSTER-COMPOSITING METHOD TO ASSESS THE PERFORMANCE OF THE SALT IODIZATION PROGRAM IN ETHIOPIA

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BACKGROUND AND OBJECTIVES
Assess performance of iodized salt at households is costly. Innovative solutions are needed to support surveillance for constant prevention of iodine deficiency disorders (IDD) through salt iodization. This study aimed to assess the validity of the Cluster-Compositing Method for monitoring iodized salt in Ethiopia.
METHODS
The study was cross-sectional at the national and sub-national levels. A total of 6148 households' salt samples were collected from 576 clusters. Single samples from the same cluster were mixed in equal proportions to make a cluster-level composite sample. Iodine determination was conducted using the titration method. The mean iodine content was determined in coarse and fine salt types.
RESULTS
Iodine content was higher in urban settings households, with higher education, and with higher wealth. Significant geographical differences were observed across sub-national levels. The two methods supported the same deductions. A strong positive correlation (r=0.83) was observed between the iodine contents estimated with composite samples and the averages per cluster based on single samples. The prevalence estimates of salt samples with iodine content below 15 ppm was comparable, although lower using the composite method (23% vs 26%). The proportion of salt samples with an iodine content between 15 and 40 ppm was also larger using composite samples (69%) against single samples (51%), and which is explained by the high random variation of the RESULTS of the latter.
CONCLUSIONS
The cluster-compositing method not only provides a cost-effective alternative to assess the performance of USI programs but also it is more precise.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_529

DECLINED DIETARY DIVERSITY IN CHILDREN AGED 12–36 MONTHS IN ACEH PROVINCE, INDONESIA

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BACKGROUND AND OBJECTIVES
Malnutrition in children under five remains a significant global public health problem. Minimum dietary diversity (MDD) is an important indicator for monitoring the nutritional status of children 6–23 months. There is less evidence for those aged 24–59 months, despite this being a crucial window for children's growth and development. This study investigates dietary diversity among children aged 12 to 36 months in Aceh Province, Indonesia.
METHODS
We used data from cross-sectional surveys conducted in 2018 and 2021 as part of an evaluation of a child well-being intervention. The 2018 survey was carried out in eight of the 23 districts in Aceh Province, while four of those eight districts were sampled in the 2021 survey. Data from 1140 participants in 2018 and 802 participants in 2021 were included in this analysis. We used descriptive statistics to compare the proportion of children aged 12–23 months and 24-36 months meeting minimum dietary diversity between 2018 and 2021.
RESULTS
The overall proportion of children aged 12-36 months who met MDD in 2021 (41%, 95% CI 37.6, 44.4) was significantly lower than in 2018 (68.2%, 95% CI 65.0, 70.4). The average MDD score for children 12–23 months decreased from 5.3 in 2018 to 4.5 in 2021; while for children aged 24-36 months, it dropped from 5.1 in 2018 to 4.1 in 2021. Compared to 2018, a significant reduction in the consumption of animal-sourced foods and vitamin A-rich fruits and vegetables was observed in 2021 ($p<0.001$).
CONCLUSIONS
Minimum dietary diversity declined among children aged 12-36 months in Aceh Province, Indonesia, between 2018 and 2021, particularly in 24-36-month-olds. The COVID-19 pandemic may have amplified the situation. This highlights the urgent need to investigate the factors influencing dietary diversity in children between the ages of 2 and 5 and strengthen programs to improve the nutritional status of this age group. These findings also call for the government's action to protect all children under 5 in public health emergencies.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_530

EFFECT OF CRICKET ENRICHED COMPLEMENTARY PORRIDGE AND NUTRITION EDUCATION ON GROWTH AMONG CHILDREN AGED 6-14MONTHS: A RANDOMIZED 2 × 2 FACTORIAL TRIAL, KENYA

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BACKGROUND AND OBJECTIVES
Improving complementary food (CF) and feeding practices are pathways for better child nutrition in food-insecure settings. Edible insect such as cricket containing high-quality protein and micronutrients are relevant in child nutrition, as potential alternative animal-source food. We evaluated effects of exposing infants enrolled at 6 months to a daily serving of cricket enriched CF porridge, combined with mother's exposure or none-exposure to nutrition education, over an 8 months period.
METHODS
We designed a 2x2 factorial randomized controlled trial having: Control, Cricket treatment (+CR), Nutrition Education (+NE) and a combined +NE with +CR. Mothers of infants were invited, and randomly assigned to the four study arms. Study CF were provided for take-home monthly supply with daily rations adjusted for age with the +CR having 20% cricket in the formulation. The +NE sessions were personalized audio-visual sessions with education messages and appointment reminder sent to mother's phones. Infant's anthropometric, household characteristics, feeding practices and child health data were collected monthly by trained assistants.
RESULTS
We enrolled 284 eligible mother/infant dyads between February and April 2023. At baseline infants were 6.3±0.5 months, weighing 7.6±1.1kgs, 65.7±3.2cm in length and stunting (< -2 Z-score) affected 12.4% of the infants. After 8 months, we found no significant ($p>0.05$) effects of either education or cricket treatment on infants' height. The WHZ gain amongst those receiving education was 0.36 Z-score ($p=0.02$).
CONCLUSIONS
Cricket enriched CF or nutrition education did not affect linear growth. Nutrition education combined with CF supported weight grain. Short-term interventions are likely insufficient to prevent stunting. ClinicalTrial NCT06002620.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_531

THE UNSUNG HEROES OF RECYCLING: ADDRESSING THE NEEDS OF WASTE PICKERS IN THE ZERO WASTE JOURNEY

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BACKGROUND AND OBJECTIVES
Approximately 1 to 2 million tons plastic waste enter the oceans each year, causing considerable harm to marine life and ecosystems. Several key regulations aimed at achieving zero waste and improving waste management was implemented, such as the regulation on waste reduction, recycling, and reuse. A presidential regulation targets a 30% reduction in waste and processing of at least 70% of the remaining waste by 2025. The involvement of waste pickers (pemulung) plays a crucial role as they can supply up to 80% of the recycle materials to companies. The study provides insights into improving the life of waste pickers.
METHODS
In-depth interviews were conducted to five waste pickers in residential suburban areas. The informants were purposively selected and the interview lasted for about 30 minutes.
RESULTS
The waste pickers, aged between 48 and 67 years, have been working for periods ranging from 2 to 30 years. They typically work 4 to 8 hours a day. Some live in the same complex with the waste collectors who lend them pushcarts. They were able to collect 1 to 3 sacks of waste per collecting period. At home or at pool sites, these materials are dried before being sold. The waste is sorted into paper/cardboard, PET bottles, tin cans, and PP plastic, with PET bottles fetching the highest price per kilogram. Waste is compiled and sold weekly, generating a total income of around IDR 300,000 to 500,000 (approximately USD 20.00 to 33.00 per month). All of the waste pickers work full-time; while her/his spouse works as a daily laborer and the other engages in farm labor. One was a family of waste pickers consists of a husband, wife, and their child. Only one waste picker has received government social safety net programs in the form of free rice and cash, while others hope to receive similar assistance in the form of free rice or cash.
CONCLUSIONS
Waste pickers play a crucial role in recycling but often lack recognition and work without the benefits and protections of formal workers, facing economic uncertainty. To address these challenges, they should be integrated into the formal waste management sector with better pay, job security, and benefits. Health and safety measures, including protective gear, health insurance, and access to medical facilities, are essential. Educational programs can help them improve their skills and transition to stable employment. Increasing public awareness and government support through micro-loans or subsidies can reduce stigma and improve their economic situation.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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2. Presidential Regulation No. 97 of 2017

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EPO5_533

ADHERENCE TO THE MEDITERRANEAN DIET PATTERN AND BODY COMPOSITION: LONGITUDINAL ANALYSIS AMONG OLDER ADULTS WITH METABOLIC SYNDROME

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BACKGROUND AND OBJECTIVES

High-quality dietary patterns may protect against chronic disease, but limited data exist from longitudinal studies on the impact of diet on body composition components, especially in the elderly. We aimed to assess prospectively the association between changes in adherence to the Mediterranean Diet (MedDiet) pattern and body composition measured with imaging technique in older adults with overweight/obesity and metabolic syndrome.

METHODS

This longitudinal study included 1456 men and women (at average 65 years) from the PREDIMED-Plus trial, conducted in Spain. Adherence to the MedDiet pattern with calorie-restriction was determined using the validated energy-reduced MedDiet (erMedDiet) screener (0-17 points; higher scores indicate greater adherence) at baseline. one and three years; Body composition (total fat mass (%), lean mass (%), lean-to-fat mass ratio, and visceral adipose tissue (g)) were measured with dual-energy X-ray absorptiometry at the same time-points. Multivariable mixed-effects linear regression models were used to determine the associations between changes in MedDiet pattern and body composition with available data at baseline, one, and three years of follow-up.

RESULTS

Greater adherence to the MedDiet was significantly associated with better body composition components. Each one-point increment in the erMedDiet score was associated with significantly (all p-values <0.001) lower total fat (β -0.10 %, 95% CI -0.13; -0.07) and visceral fat mass (-16.5 g, -22.8; -10.1), higher total lean (0.09 %, 0.07; 0.12) and lean-to-fat mass ratio (0.01, 0.01; 0.01) over 3-year period. Significant dose-response relationship (all P for trend <0.001) was observed between all body components and erMedDiet score modeled as categorical (in tertiles) variable.

CONCLUSIONS

Greater adherence to an energy-reduced Mediterranean Diet pattern, was associated with favourable body composition changes in older adults with overweight/obesity and metabolic syndrome.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_534

LEADING CHANGE IN CHILD AND ADOLESCENT NUTRITION THROUGH WORLD VISION INTERNATIONAL CHILD-LED ADVOCACY AND MEANINGFUL PARTICIPATION (CHAMP) RESEARCH IN THE SOUTH ASIA PACIFIC REGION

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BACKGROUND AND OBJECTIVES
Children in the South Asia and Pacific (SAP) region face a double burden of malnutrition, with stunting affecting approximately 30% of children under five and wasting impacting around 14% (GNR 2022). In response to this pressing issue, the World Vision International South Asia and Pacific (WVI-SAP) Child-Led Advocacy and Meaningful Participation (CHAMP) regional changemakers convened in 2023 to initiate a multi-country, child-led research project focused on hunger and malnutrition (WV2024). Building on this effort, WVI partnered with the Young and Resilient Research Centre (Y&R) at Western Sydney University to empower CHAMP youth leaders. This collaboration supports young leaders in conducting child-led research projects, providing them with tools to explore the impacts of hunger and malnutrition within their own communities.
METHODS
Working with WVI Country Offices in Bangladesh, India, Indonesia, Nepal, Philippines, and Sri Lanka, Y&R held research capacity building training sessions with 15 CHAMP youth leaders (aged 16-22) on research methods, research ethics, workshop facilitation and data analysis. CHAMP youth leaders identified a food and nutrition issue they are facing and developed a research question. A qualitative, participatory workshop methodology was then utilised by CHAMP youth leaders to explore their research questions. Participatory workshops involved the use of interactive and creative activities selected by the CHAMP youth leaders to elicit participants' responses and ideas.
RESULTS
From July 2024, researchers from Y&R supported 15 WVI CHAMP youth leaders and their mentors to generate child-led research from their chosen research question. Research questions varied from exploring knowledge gaps in adolescent girls for iron-rich foods, through to food access for vulnerable communities, and impacts of economic crisis on the food impacting the ability of young people to get enough healthy food. Twenty participants aged 10 to 18 years were recruited from each country (n=120) for the participatory workshops.
CONCLUSIONS
The youth-led workshops provided valuable insights from young people on school meals, nutrition knowledge, impact of climate and humanitarian considerations and the experience of hunger in the most vulnerable communities. Enabling young people to lead nutritional research from study design to data gathering and interpretation of findings, empowering them to be advocates for change in their communities.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_536

CHALLENGES AND SOLUTIONS TO ADOPTING HEALTHY DIETS AMONGST WOMEN OF REPRODUCTIVE AGE AND CHILDREN UNDER FIVE: A QUALITATIVE PHOTOVOICE STUDY IN URBAN ETHIOPIA HIGHLIGHTS THE NEED FOR GOVERNMENT AND SOCIETAL ACTION

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BACKGROUND AND OBJECTIVES

The coexistence of multiple forms of malnutrition is a public health challenge in Sub-Saharan Africa that requires new interventions and approaches. Ethiopia has one of the highest rates of undernutrition amongst children under 5 and women of reproductive age (WRA) globally, alongside rising overweight/obesity, particularly in urban areas. Poor diet is a shared driver of multiple forms of malnutrition. Hence, our study explored the perceived challenges and solutions for achieving healthy diets among WRA and their children in urban Ethiopia.

METHODS

Qualitative participatory photography (Photovoice) was used among WRA living in deprived or wealthier neighbourhoods of Addis Ababa. Women told the stories of their photographs and discussed challenges and solutions to adopting healthy diets in focus group discussion workshops (n=5). Inductive thematic analysis was undertaken to identify emerging themes and subthemes, with comparisons across socio-economic groups.

RESULTS

Across all socio-economic groups, WRA reported that the main challenges regarding the adoption of healthy diets were the high cost of food, time constraints, lack of knowledge about healthy diets, and inaccessibility of healthy foods. Solutions proposed by women included: the creation of job opportunities; raising awareness, via mainstream/social media and healthcare professionals, about healthy diets and equal division of labour related to caregiving and household chores; opening government-owned stores that sell nutritious foods at a lower price; and providing land to build daycare centres. In deprived groups, women reported issues with their home food environment (e.g., unclean cooking area, lack of cooking utilities, power cuts, water scarcity) that were unconducive to preparing healthy and safe meals. Women proposed that the government provides sustainable water and electricity to households and subsidise the cost of household appliances. Women also proposed strengthening an existing community loan scheme (Ekub). In wealthier groups, unhealthy food preferences, easy access to unhealthy foods, and availability of unhealthy foods at social events were stated as challenges. Restricting the promotion and availability of unhealthy foods was seen, by wealthier groups, as key to achieving healthy diets.

CONCLUSIONS

Financial and physical inaccessibility to healthy foods, time constraints and poor knowledge about healthy diets are the biggest contributors to poor diets in this context. Women proposed several context-relevant solutions to facilitate the adoption of healthy diets, thereby tackling multiple forms of malnutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_537

LACTOSE INTAKE IN THE CHINESE POPULATION: A DIET MODELLING STUDY WITH A LOW-LACTOSE MILK

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BACKGROUND AND OBJECTIVES
Dairy intake in the Chinese population is far below the nutritional guidelines, due to concerns linked to lactose malabsorption (Storhaug et al., 2017). However, there is emerging evidence linking low lactose consumption, i.e., below the threshold for causing malabsorption related complaints, with health benefits including reduction of the risk of having lactose intolerance symptoms (JanssenDuijghuijsen et al., 2023; Li et al 2018; Luo et al., 2024). The objective of this study is to assess the lactose intake in the Chinese population and model the potential impact of a newly formulated low-lactose milk.
METHODS
Due to the lack of lactose content in the Chinese Food Composition table, we imputed lactose values by mapping dairy-based food items to equivalents from the USDA or French food composition databases and applying a lactose-to-carbohydrate ratio. Using the China Health and Nutrition Survey (CHNS)-2011, we estimated the baseline lactose intake in the Chinese population. Two diet modelling scenarios were applied to assess the changes in lactose intake: addition of one serving (200ml) of low-lactose milk vs. normal milk to participants not meeting the dairy recommendation, and substitution of current dairy products with equivalent low-lactose milk among dairy consumers. We considered 12g/d as the lactose threshold for risk of lactose intolerance symptoms (EFSA, 2010) and assessed the percentage of participants above this threshold in both scenarios.
RESULTS
The study included data from 14,178 CHNS-2011 participants aged 3 years and above. 67.6% of participants did not consume any dairy product, and only 1.4% adhered to the daily dairy recommendation of at least 300g/d. The overall lactose intake at baseline was 1.9±6.5g/d (mean ± SD) with 3.7% of the population above 12g threshold. Among dairy consumers, the lactose intake was 8.3±10.7g/d and 16.3% of them above the 12g/d threshold. Addition of low-lactose milk led 4.9% of participants consuming excess lactose, vs. 12.4% with addition of normal milk. Substituting all dairy consumption with low-lactose milk decreased the percentage of participants above the 12g/d threshold from 16.3% to 0.8%.
CONCLUSIONS
In the context of the high prevalence of lactose malabsorption in China, low-lactose milk could be an optimal solution, as consuming small amounts of lactose could help to reduce the risk of having lactose intolerance symptoms while benefiting from lactose consumption.
CONFLICTS OF INTERESTS
All authors are employees of Nestlé Research. All authors declare no other competing interest.

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EPO5_538

ASSESSING THE NUTRITION EDUCATION NEEDS OF PATIENTS FOLLOWING TOOTH EXTRACTIONS

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BACKGROUND AND OBJECTIVES
Tooth extractions are common procedures carried out in dental practices globally. Some research has reported that dietary changes are reported among 24% - 32% of patients after dental extraction with the most frequent issues being difficulty in chewing and the inability to enjoy the experience of eating food. These issues could result in a compromised nutritional status which could in turn result in an impaired immune response, increased infections, retarded wound healing and ultimately compromising overall health. Nutrition education is currently underemphasized in dental facilities in Ghana. This study aimed to evaluate the nutrition education needs of tooth extraction patients in a university hospital in Ghana.
METHODS
A cross-sectional online survey design was employed to collect data from participants aged 18 years and above, who had previously undergone a tooth extraction. Background information, history of tooth extraction and nutritional challenges after tooth extraction were collected using a pretested questionnaire developed by the researchers. Data were analysed using the Statistical Package for Social Sciences (SPSS version 23.0). Ethical approval for the study was sought and obtained from the Ethics and Protocol Review Committee of the School of Biomedical and Allied Health Sciences with protocol identification number SBAHS/AA/DT/10624586/2019-2020. Informed consent was obtained electronically from each participant.
RESULTS
A total of 63 eligible responses were received of which majority (n=40, 63.5%) were females. Ten respondents reported complaints post tooth extraction, with majority (6) reporting debilitating pain as their chief complaint. About half of respondents (n=32, 50.8%) reported difficulties in eating and drinking certain foods and beverages post tooth extraction,. Majority of respondents (n=43, 67.9%) reported that they would have benefited from general oral care advice after tooth extraction, whilst 20.6% (n=13) would have liked to receive specific advice on foods to avoid after tooth extraction. None of the respondents consulted with a dietitian or nutrition professional regarding their tooth extraction.
CONCLUSIONS
There is the need for provision of tailored nutrition services to patients who undergo dental extractions to help manage debilitating pain, prevent infections, support wound healing and ensure optimal recovery. This study highlights the importance of collaborations and partnerships to improve outcomes of patients who undergo tooth extraction.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_539

PROBIOTICS/FISH OIL INTERVENTION IN PREGNANT WOMEN WITH OVERWEIGHT/OBESITY LOWERS THE RISK OF OVERWEIGHT IN THEIR 24-MONTH-OLD CHILDREN

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BACKGROUND AND OBJECTIVES

Children of women with overweight/obesity have an increased risk themselves to become overweight. The aim in this study was to investigate the influence of fish oil and/or probiotics intervention in pregnant women with overweight/obesity on their two-year-old children's overweight risk.

METHODS

Women (n = 439) were double-blindly randomized into four intervention groups (fish oil+placebo, probiotics+placebo, probiotics+fish oil, and placebo+placebo) in early pregnancy and the intervention lasted up to six months post-partum. Fish oil capsules contained 1.9 g docosahexaenoic acid and 0.22 g eicosapentaenoic acid while probiotic capsules included *Lacticaseibacillus rhamnosus* HN001 and *Bifidobacterium animalis* ssp. *lactis* 420, 10^10 colony-forming units each. Growth data of children (n=330) were gathered at three, six, 12 and 24 months from welfare clinic cards. The growth variables were calculated based on the Finnish growth charts. Adjusted logistic regression models were used in the analysis.

RESULTS

Maternal consumption of probiotics+placebo and probiotics+fish oil were associated with lower odds of child being overweight (weight-for-height%, adj.OR=0.36, 95% CI=0.14–0.95, weight-for-age SD-score adj.OR=0.22, 95% CI=0.07–0.71) when compared to the placebo+placebo. Similar RESULTS were seen when probiotics' main effect was evaluated compared to non-probiotics: weight-for-height% adj. OR=0.48, 95% CI=0.25–0.95, weight-for-age SD-score adj. OR=0.42, 95% CI=0.20–0.88. No fish oil main effect was detected.

CONCLUSIONS

Consumption of probiotics alone or in combination with fish oil by pregnant women with overweight or obesity could lower their children's overweight risk at the age of two years.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_540

EVALUATING THE PLANNING AND IMPLEMENTATION OF VITAMIN A SUPPLEMENTATION (VAS) MASS CAMPAIGNS; INSIGHTS FROM SEVEN AFRICAN COUNTRIES DURING (JANUARY – JUNE 2024)

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BACKGROUND AND OBJECTIVES
In 2024, Helen Keller supported vitamin A supplementation (VAS) campaigns for children aged 6 to 59 months in several countries, aiming for 100% coverage. For effective implementation, Helen Keller uses tools to control and optimize planning and execution, track timelines, prepare data, and coordinate stakeholders. This study evaluates the planning and implementation processes for VAS campaigns in the first half of 2024.
METHODS
This analysis examined data from 7 countries (Burkina Faso, Cameroon, Côte d'Ivoire, DRC, Guinea, Kenya, Madagascar, Mali, Niger, Nigeria) where Helen Keller supported VAS campaigns in the first half of 2024. Data was collected using various monitoring tools:
Checklists: Tracked campaign stages (stakeholder coordination, procurement, funds, training, social mobilization).
Campaign Reports: Documented challenges.
Email Records: Tracked contract approval with state entities, focusing on approval dates.
The data were analyzed using Excel to evaluate key indicators, including VAS capsule availability, contract government approval deadlines, and variations between planned and actual start dates.
RESULTS
In the first half of 2024, only 20% of countries met the six-month interval between VAS campaigns. The rest experienced delays of 0.33 to 3.1 months due to heavy rainfall, supply issues, and program interference. While 30% of countries prepared inputs on time, 70% faced delays due to insufficient vitamin A stocks. Financial coordination improved, with 75% of countries approving contracts on time. However, gaps in targeting populations could affect campaign coverage and efficacy.
CONCLUSIONS
These findings highlight critical areas for improvement in planning, resource management, and stakeholder coordination to optimize future VAS campaigns.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_541

EFFECT OF INFANT VITAMIN D SUPPLEMENTATION ON EPIGENOME-WIDE DNA METHYLATION

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BACKGROUND AND OBJECTIVES

Early life exposures can alter individual's epigenome and lead to long-term health consequences. Severe and chronic vitamin D deficiency causes nutritional rickets in childhood; however, high vitamin D dosages can also have disadvantageous health implications. Data on vitamin D and epigenetic alterations are limited. We aimed to examine whether higher vitamin D supplementation dose compared with a standard dose affects epigenome-wide DNA methylation (DNAm) in 1-year-old infants.

METHODS

In the Vitamin D Intervention in Infants (VIDI) study, 987 infants were randomized to receive daily vitamin D supplementation of 10µg (group-10) or 30µg (group-30) from age 2 weeks until age 2 years. To analyze DNAm with Illumina EPIC 850K array, we randomly selected 286 participants at age 1 year with available DNA samples isolated from whole blood within intervention groups and sexes. Epigenome-wide association analyses were conducted via R package *Meffil* adjusted for sex, parental smoking status, maternal age and education, infant length-adjusted weight and age, cell count estimates and batch effect.

RESULTS

We observed no significant epigenome-wide DNAm differences between group-10 (n=143) and group-30 (n=143) ($p<9.4 \times 10-8$). Top three sites, comparing group-10 with group-30, were annotated to genes *PRDM16* (cg05790380: coefficient 0.007, p=3.0 × 10-7), *HIPK2* (cg20001906: 0.02, p=1.9 × 10-6) and *PPM1H* (cg03919488: 0.01, p=2.4 × 10-6) related with e.g. brown adipocyte differentiation, serine/threonine kinase functions and phosphorylation processes, respectively.

CONCLUSIONS

Our RESULTS indicate no effect of higher vitamin supplementation of 30µg compared with standard dose of 10µg on epigenome-wide DNAm in infants aged 1 year. Further plan is to examine the effect in specific vitamin D related sites as well as to explore individual dose-response effect on DNAm.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_542

MATERNITY PROTECTION FOR WOMEN AND THE POTENTIAL IMPLICATIONS FOR BREASTFEEDING ON RETURN TO WORK AT A TERTIARY HOSPITAL

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BACKGROUND AND OBJECTIVES
Optimal maternal health and support in the workplace can have a positive impact on the health outcomes of mother and baby. Therefore, legislation specifies that women be protected during the pregnancy period and on return to work. Adequate maternity protection in the workplace can result in benefits to the child's long-term health and positive effects for workplaces. The aim of this research was to determine the availability of maternity protection practices in the workplaces and the potential implications for breastfeeding.
Objectives: To describe available policies on maternity protection and support to staff at a tertiary hospital. To explore associations between knowledge of women working at a tertiary hospital on maternity protection and their breastfeeding practices on return to work after maternity leave.To explore the attitudes, knowledge and level of support from individuals in management positions at a tertiary hospital, towards women breastfeeding on return to work following maternity leave.
METHODS
A descriptive study using an online questionnaire with purposefully selected women employees at the tertiary hospital who have had a baby in the last 3 years. Additionally, a semi-structured questionnaire will be completed with purposefully selected members of different levels of management at the hospital. Data will be analyzed with support of statistical software and presented in table and graph format.
RESULTS
The findings demonstrated in terms of the maternity protection package such as maternity leave, women were granted four months including paid benefits. With the protection of the women's health, they had mixed responses as to how certain duties affected their health. A lack of knowledge shown of their right to health and safety during pregnancy and after birth was evident. Overall, women lack the knowledge and understanding of the policies and legislation on maternity protection. Only 67% responded that they continued breastfeeding on return to work.The semi-structured interviews demonstrated lack of knowledge of policies and legislation.
CONCLUSIONS
Findings suggests the need to inform women and create more awareness on maternity protection benefits and rights of women during and after pregnancy. The study identified implementation gaps that limits effectiveness of maternity protection.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_543

THE ASSOCIATION BETWEEN DIETARY DIVERSITY, PHYSICAL EXERCISE, NUTRIENT INTAKE AND OTHER FACTORS AMONG ADULTS

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BACKGROUND AND OBJECTIVES
The increasing studies for nutritional assessment of specific disease conditions and for women, children and geriatric people creates a lack of recent nutritional assessment related studies for the seemingly healthy adult population. This research aimed to search between the various factors that have been associated with nutrition among the adult population of Raipur citizens.
METHODS
The research was a cross-sectional study of citizens of Raipur city aged between 16 and 45 years of age. The samples were selected by convenient sampling. A total of 65 samples were given to fill a self-prepared questionnaire, which included questions assessing the nutrient intake of the population, their cooking and eating habits, their physical activities, consumption of unhealthy/packaged foods, and lifestyle-related habits. The data was analyzed using SPSS software.
RESULTS
From the analysis of the data collected, it was deduced that the average calorie (60%) intake of the sample is lower than what is recommended by RDA, as is the case with carbohydrates (47%) and fat (48%). However, the protein intake (104%) is more. Contribution of macronutrients to total calories does not fully comply with EAT-Lancet recommendation, with more carbohydrate intake, lower fat intake and normal protein intake. Average scores of dietary diversity, nutrient intake, physical activity, cooking and eating practices, lifestyle practices and consumption of unhealthy foods were 6.83 (out of 10), 3.20, 0.70, 3.97, 4.16 and 1.70 (out of 5) respectively. A decreasing trend is seen regarding calorie intake from food groups from underweight to overweight/obese samples, indicating more consumption of processed and packaged food by the latter. The scores of dietary diversity and good cooking and eating practices decreased with increasing BMI. The scores of lifestyle practices and physical activity increased with increasing BMI.
CONCLUSIONS
This study provides valuable insights into how dietary diversity, physical activity, nutrient intake, and lifestyle practices collectively influence the nutritional status and BMI of adults in Raipur. The RESULTS suggest that the overweight population consumes fewer nutrients essential for a balanced diet compared to their underweight counterparts, reflecting the impact of poor dietary choices. There may be certain other factors that influence the nutritional status and BMI of people.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_544

NUTRITION KNOWLEDGE AND DIETARY HABITS AMONG UNIVERSITY STUDENT-ATHLETES

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BACKGROUND AND OBJECTIVES
Nutrition is invaluable in enhancing athletic performance. It is of greater importance in student-athletes who require good nutrition for both academic and athletic performance. In spite of this, research has shown that this population often have poor dietary habits. With nutrition education programs based on the premise that, good nutrition knowledge equals good dietary habits at the forefront of solutions to promoting good dietary habits, this study looked at participants' nutrition knowledge, dietary habits and preferred source of nutrition information and assessed correlations between these variables.
METHODS
The study was cross-sectional and used self-administered questionnaire to collect socio-demographic data and information about the preferred source of nutrition information as well as assess the nutrition knowledge and dietary habits of its ninety-one participants, who were student-athletes of a university in Ghana. Associations between nutrition knowledge and dietary habits and variables of interest were subsequently investigated using Spearman's correlation test, chi-square, linear and multiple regression analyses with the level of statistical significance set at $p< 0.05$.
RESULTS
The analysis showed a very weak, insignificant but positive relationship between nutrition knowledge and dietary habits ($rs = 0.098$, $p = 0.380$). Similar RESULTS were obtained for age and nutrition knowledge ($rs = 0.239$, $p = 0.025$). No other variables yielded statistically significant correlations. The internet was the most patronized source of nutrition information (39.6%) and nutrition professional were the least patronized (4.4%).
CONCLUSIONS
Improving the dietary habits of this population would require programs which aim at helping student-athletes practicalize their nutrition knowledge. The study also highlighted the low involvement of nutrition professionals in sports in universities.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_545

NUTRITIONAL RISK PREVALENCE AND PROFILE AMONGST INFANTS UNDER 6-MONTHS IN KENYA, MOZAMBIQUE, NIGERIA, SOMALILAND, AND YEMEN

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BACKGROUND AND OBJECTIVES
With support from The Church of Jesus Christ of Latter-Day Saints (LDSC), as part of the 'Helping Babies Thrive': management of small and nutritionally at-risk infants under 6 months (u6m) and their mothers (MAMI) Project, Save the Children conducted an assessment in Kenya, Mozambique, Nigeria, Somalia, and Yemen with the objective to measure the prevalence and risk profile of small and nutritionally at-risk infants u6m.
METHODS
Simplified Lot Quality Assurance Evaluation of Access and Coverage (SLEAC) methodology was applied as the assessment also measured coverage of the MAMI Care Pathway in project locations. Sample size for Coverage was used for all other indicators of interest. The first stage of sampling was random selection of villages within included health facility catchment areas and second stage was exhaustive, including all infants u6m in selected villages, through door-door questionnaires. Prevalence was estimated based on the total number of infants u6m and their mothers who completed the MAMI eligibility questionnaire during the coverage assessment. Qualitative data was also collected through focus group discussions and key informant interviews with key members of the community.
RESULTS
Prevalence of small and nutritionally at-risk infants less than 6 months was estimated as 48% in Kenya, 63% in Mozambique, 76% in Nigeria, 65% in Somalia and 78% in Yemen.

Risk Factor	Kenya	Mozambique	Nigeria	Somalia	Yemen
Feeding risk(s)	56%	21%	52%	34%	58%
Underweight (WAZ<-2SD)	15%	24%	36%	32%	40%
Low Infant MUAC	35%	34%	18%	25%	33%
Low Weight-for-Length (WFL<-2SD)	19%	8%	26%	54%	29%
Pre-term birth	6%	10%	25%	13%	16%
Low birthweight	7%	17%	22%	15%	11%
Mother with acute malnutrition (by MUAC)	10%	34%	7%	2%	31%
Adolescent mother	6%	18%	2%	12%	7%
Multiple birth e.g. twin, triplet	5%	5%	9%	6%	2%
Orphan	6%	4%	1%	7%	2%
Presence of Oedema	0%	0%	1%	2%	0%

CONCLUSIONS
Prevalence of small and nutritionally at-risk infants u6m in project locations was found to be high confirming a critical need to ensure we identify and support at-risk infants u6m.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_546

FOOD ADDICTION, NUTRITIONAL STATUS AND ULTRA-PROCESSED FOODS CONSUMPTION IN CHILEAN UNIVERSITY STUDENTS

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BACKGROUND AND OBJECTIVES
Food addiction (FA) to ultra-processed foods (UPF) has been identified as a contributing factor to the onset and progression of obesity. In Chile, obesity represents a critical public health issue. Despite indications that FA is becoming increasingly prevalent among young adults, its prevalence in the Chilean population has been the focus of only a limited number of studies. The aim of this study was to evaluate the association between FA, nutritional status, and the consumption of UPF in Chilean university students.
METHODS
An observational, analytical and cross-sectional study was carried out. Sampling was non-probabilistic for convenience. N=287 participants were recruited, from two Universities. YFAS 2.0-Chile and an adapted version of the NOVA screener were applied using the online platform REDCap. In addition, body composition (InBody® technology BIA) and anthropometric measurements (weight, height, waist circumference) were assessed by trained and standardized evaluators, to determine nutritional status.
RESULTS
The sample was composed mainly by women (55.7%), with an average age of 21.3 ± 2.3 years. The prevalence of FA was 17.4% (4% for mild, 14% for moderate and 82% for severe FA), the mean symptom count was 2.5 ± 3.1), with “food consumed in larger quantities or over a longer period than intended” being the most prevalent criterion (33.5%). Students with FA had significantly higher body mass index (BMI) and body fat percentage compared to non-FA students ($p = 0.024$ and <0.001, respectively). Additionally, participant with FA consumed higher amount of UPF beverages and snacks the day before ($p = 0.027$ and 0.009, respectively), with significantly higher punctuations in NOVA score (7.1 ± 2.6 vs 6.3 ± 3.1; $p=0.032$). Finally, a weak but significant correlation between NOVA score and FA symptom count was found (rho=0.19 $p=0.001$).
CONCLUSIONS
This study identifies a significant prevalence of FA among Chilean university students, with associations to higher BMI and body fat percentage. FA was also linked to greater UPF consumption and elevated NOVA classification scores. A weak but significant correlation was found between UPF consumption and FA symptoms. These findings underline the role of UPF in addictive eating behaviors. Targeted interventions are essential to mitigate FA's impact on obesity and dietary health in young adults.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_547

ROLE OF DOMESTIC FOOD ENVIRONMENTS IN THE RELATIONSHIP BETWEEN FOOD ACCESS AND DIET QUALITY IN CHILDREN DURING THE COVID-19 LOCKDOWN IN CHILE: A MIXED METHOD STUDY

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BACKGROUND AND OBJECTIVES
Households from lower socioeconomic backgrounds are disproportionately exposed to unhealthy external food environments, resulting in poorer dietary quality. To mitigate health disparities, it is essential to understand the interplay between these external environments and intra-household dynamics that influence food acquisition, particularly among children. This study examines the relationship between food access, domestic food environments, and dietary quality among low- to middle-income Chilean children during the COVID-19 lockdown.
METHODS
We used an explanatory sequential mixed methods design, combining a survey of 999 households with a qualitative photo-elicitation study in a nested sample of 14 households. This abstract focuses specifically on the integration stage of the study, which occurred by merging the quantitative and qualitative RESULTS through a side-by-side joint display. This process involved two steps: (1) displaying the quantitative and qualitative RESULTS for each of the study's overarching themes in a joint display table, and (2) drawing meta-inferences as a result of assessing the relationship between the two types of RESULTS (i.e., convergence, divergence, expansion, or complementarity).
RESULTS
The findings reveal that greater gender equity in household food responsibilities correlates with improved child nutrition. Time constraints, exacerbated by sole female food gatekeepers, limit healthy food purchasing, increase reliance on unhealthy options, and hinder culinary skill development. Two pathways emerge: gender and time inequalities influence food purchasing decisions and meal preparation and consumption. Furthermore, households with a sole female food gatekeeper often lack the nutritional resilience to cope with additional intra-household challenges, compromising time management and jeopardizing children's dietary well-being.
CONCLUSIONS
Policies must consider the interplay between external food environments and intra-household gender-time realities. Short-term measures should increase access to nutritious food for time-constrained food gatekeepers, while long-term policies should promote cultural shifts towards equitable food responsibilities. Interventions should leverage the coping strategies of more resilient households to strengthen community capacity, fostering nutrition resilience among more vulnerable households.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_548

FROM MONITORING TO ACTION: ENHANCING SCHOOL FOOD ENVIRONMENTS BASED ON STUDENT INSIGHTS

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BACKGROUND AND OBJECTIVES
School food environments significantly influence young people's eating behavior, yet they often promote unhealthy choices. This research aimed to monitor the food environment in and around schools, explore students' behavior and preferences, and test strategies to improve the food offerings in these environments.
METHODS
As part of the "Campus of the Future" project, multiple studies were conducted. First, the ready-to-eat food offerings within a 400-meter radius of schools in 's-Hertogenbosch, The Netherlands, were assessed for healthiness, categorized as either within or outside the Dutch *Schijf van Vijf* (Wheel of Five) [1]. Second, in a survey among vocational education students data was collected on their purchasing habits during school hours, also their food purchases were observed at the top three most visited ready-to-eat outlets near the school. Finally, in a survey among secondary school students their purchasing habits around school hours were recorded. These students also participated in a design sprint to co-create healthy food concepts for their school canteen.
RESULTS
Only 8% of analyzed ready-to-eat offerings around schools fit within the Wheel of Five. The survey among vocational education students showed that the most popular food locations were their own school canteen, Jumbo supermarket, AH to go and McDonald's. However, only 4% of the items purchased at the latter three locations met the Wheel of Five criteria.
The survey among secondary school students showed that 75% of these students buy food or drinks in or outside of school, with the most popular locations being their own canteen, Jumbo supermarket, and McDonald's. Key drivers of purchasing decisions included cost, taste, and proximity. The design sprint with these students led to innovative, student-endorsed food concepts for their own canteen, including culturally diverse healthy options.
CONCLUSIONS
Students in both vocational and secondary education often buy food during school hours, yet their food environment is mostly unhealthy. To improve the food environment, it is essential to focus on providing affordable an appealing healthy options, particularly within the school canteen, as it is the most convenient location for students. Co-creating healthy food concepts with students can be a way to achieve this.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_550

HABITUAL SPERMIDINE INTAKE IN AN ELDERLY POPULATION WITH METABOLIC SYNDROME: LONGITUDINAL ASSOCIATIONS WITH CARDIOMETABOLIC MARKERS AND HEPATIC INDEXES

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BACKGROUND AND OBJECTIVES
Polyamine and particularly spermidine (SPD) metabolism, have been identified as key pathways responsible for the autophagy enhancement observed during calorie restriction and fasting. Dietary SPD has been suggested to be associated with aging-related cardiometabolic traits such as glucose homeostasis, body weight or blood lipids. Additionally, relevant food groups such as mushrooms, legumes or nuts are rich sources of dietary SPD. However, little is known about the role of dietary SPD intake in metabolic syndrome (MetS). This analysis evaluated the longitudinal association between 1-year changes in dietary SPD intake, cardiometabolic traits and liver function indexes in overweight and obese elderly subjects with MetS.
METHODS
Baseline and 1-year follow-up data from 3639 participants of PREDIMED-Plus Trial were used for analysis. Dietary intake of SPD was estimated using the semi-quantitative food frequency questionnaire (SFFQ) validated for the Spanish population and consistent with this SFFQ, a nutrient database for SPD was compiled. Cross-sectional analyses were performed to assess baseline differences in cardiometabolic traits among tertiles of dietary SPD intake. Linear and logistic regression models were carried out to evaluate the association between tertiles of 1-year change in dietary SPD intake and 1-year changes in cardiometabolic traits and liver function indexes.
RESULTS
At baseline, higher dietary SPD intake was significantly associated with higher HDL-cholesterol, HbA1c and lower TG, ALT, GGT and fatty liver index. Compared to baseline, an increase in dietary SPD intake over 1-year was significantly associated with greater reductions in FPG, HbA1c, TG, TG/HDL, ALT and improvements in liver function indexes.
CONCLUSIONS
Collectively, an increase in dietary SPD intake was longitudinally related to significant improvements in cardiometabolic traits and liver function indexes.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_551

SEASONALITY IN DIETARY PATTERNS AND DIET QUALITY IN BANGLADESH: A LATENT CLASS ANALYSIS OF URBAN ADOLESCENTS

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BACKGROUND AND OBJECTIVES
Previous studies in low- and middle-income countries have explored dietary patterns, but very little is known about the seasonality of these dietary patterns. Moreover, most studies in Bangladesh focused on rural adolescents, and little is known about adolescents in low-income urban Bangladesh. We aimed to identify seasonality in dietary patterns and examine diet quality and sociodemographic predictors of these dietary patterns in this population.
METHODS
We analyzed data from 24-hour recalls collected in three seasons in 2015-2016; Spring (Feb–May), Summer-Fall (Jun–Oct), Winter (Nov–Feb) among adolescents (n = 483, 10–19 years) from low-wealth households, part of the urban food consumption survey in Dhaka city, Bangladesh. Latent Class Analysis (LCA) was used to identify dietary patterns based on food group consumption, separately for each season. Bivariate analyses were used to compare diet quality scores between patterns in each season, assessed as Global Diet Quality Scores (GDQS)-Healthy (range 0-32), GDQS-Unhealthy (0-17), and Food Group Diversity Score (FGDS, 0-10), higher score represents higher diet quality for all. Multinominal logistic regression was used to explore predictors of dietary patterns per season.
RESULTS
We identified four groups of adolescents with distinct dietary patterns for each season, naming them ‘Least Diverse’, ‘Moderate Diverse’, ‘Diverse’, and ‘Most Diverse’. These patterns showed small differences in GDQS-Healthy, GDQS-Unhealthy, and FGDS, reflecting some variations in both variety and quantity of food group consumption across seasons. GDQS-Healthy ranged between 6.9 and 9.0, while GDQS-Unhealthy ranged between 6.9 and 8.8, and FGDS ranged from 4.3 to 5.9, from the 'Least Diverse' to the 'Most Diverse' patterns over all seasons. Adolescents’ age predicted dietary pattern classification in Spring, no demographic characteristics predicted classifications in Summer-Fall, and both education and household wealth-tertiles were predictors in Winter.
CONCLUSIONS
Across three seasons, adolescents in low-wealth households were clustered into distinct dietary patterns, with limited variations in diet quality due to low consumption of healthy food groups, suggesting minimal seasonality in dietary patterns in urban Bangladesh. Tailored nutrition interventions are needed to increase healthy food consumption among adolescents in low-income urban Bangladesh, where year-round availability of different seasonal foods may play a role.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_552

INCLUSION OF A PRE-BIOTIC (RICE BRAN) IN READY-TO-USE THERAPEUTIC FOOD SUPPORTS GROWTH AND TREATMENT OF ACUTE MALNUTRITION IN INDONESIAN CHILDREN: THE SOLUTIONS TO ENHANCE HEALTH WITH ALTERNATIVE TREATMENTS (SEHAT) TRIAL

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BACKGROUND AND OBJECTIVES
Current ready-to-use therapeutic foods (RUTFs) aim for improving weight gain, but not gut microbiota, leaving children susceptibility to relapse. Rice bran, a nutrient-dense, prebiotic food ingredient, can influence the gut microbiome and support healthy growth in children. The study aimed to compare the treatment effectiveness of a locally produced RUTF (RUTF-), previously tested for its acceptability and efficacy, to an RUTF with 5% rice bran (RUTF+) in children with acute malnutrition. Primary outcomes were weight gain, mid-upper arm circumference (MUAC) and anthropometric *z*-scores.
METHODS
200 children aged 6–59 months with uncomplicated SAM (weight-for-height z-scores (WHZ) <−3, and/or mid-upper arm circumference (MUAC) <115mm, and or having bilateral pitting oedema +/++), or approaching SAM (WHZ<−2.5) were enrolled in a double-blinded randomized, controlled trial. Linear mixed models were applied across all ages and split by age group (6-23 months and 24-59 months) at weeks 0, 4, 8, 12, and 16 for intention-to-treat analysis (ITT) and per protocol analysis (PP).
RESULTS
Overall weight gain after 4 weeks was +390 g, but in children receiving RUTF+, weight gain tended to be greater (+430g) than in children receiving RUTF- (+349 g; p=0.059). The same trend was seen for children >24 mo of age (p=0.07; +458 and +359 g respectively), but not in younger children (p>0.2; +375 g and +337 g respectively). Differences in weight gain were less pronounced at week 8 (+527 g for RUTF+ and +447 g RUTF-, p=0.12) and disappeared in the follow-up period. There were no significant differences between treatment groups for the other anthropometric outcomes.
CONCLUSIONS
This study provides the first evidence for the benefits of using stabilized rice bran, a well-known pre-biotic, incorporated into products to treat acute malnutrition; larger studies are warranted. The findings have important implications for the treatment of acute malnutrition and emphasize the importance of considering the intestinal microbiome and the child's age (above and below 2 years old) when designing treatment programs.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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SOCIAL DETERMINANTS OF ULTRAPROCESSED PRODUCTS AND SUGAR-SWEETENED BEVERAGES CONSUMPTION IN GUATEMALAN ADULTS: DATA FROM A NATIONAL REPRESENTATIVE SURVEY, SIVESNU 2022-2023

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BACKGROUND AND OBJECTIVES

In Guatemala, the magnitude and distribution of important dietary risk factors for non-communicable diseases (NCD) such as consumption of sugar-sweetened beverages (SSB) and ultra-processed products (UPP) remain unknown. This study aimed to 1) Estimate the distribution of SSB and UPP consumption and its association with sociodemographic characteristics (SC), and 2) Evaluate whether consumption is associated with excess weight in adults.

METHODS

Cross-sectional analysis of a nationally representative survey from the Epidemiological Health and Nutrition Surveillance System, 2022-2023 (SIVESNU). The percentage of energy from UPP and SSB relative to total calorie intake were assessed through a 30-day semi-quantitative food frequency questionnaire. NOVA classification was used to define UPP and consumption was categorized into quartiles. Regression models were used to evaluate the association of quartiles of SSB and UPP and SC (sex, age, socioeconomic status -SES-, education level, area, ethnicity). For aim 2, we evaluated BMI as continuous, overweight (BMI ≥25 and <29.9), obesity (BMI ≥30) and excess weight (BMI ≥25). Linear and logistic regression models were conducted to examine associations adjusting for SC and sitting time.

RESULTS

Guatemalan adults consumed on average, 17.4% of total energy intake from UPP and 6.2% from SSB. The highest intakes of UPP (Q4) were observed in the highest strata of SES, (46%, 95% CI 38.1-54.0; p<0.01), non-indigenous (72%, 95% CI 65.2-78.9; p<0.01), living in urban areas (53.9%, 95% CI 41.8-66.0; p<0.01), and had completed secondary education (44.9%, 95% CI 39.8-49.9; p<0.01). The same pattern was observed for SSB consumption. The population with the highest UPP consumption (38.6%, 95% CI 37.7-39.6; p<0.01) also consumed more calories from SSB (10.3%, 95% CI 9.6-11.0; p<0.01) compared to those in the lowest quartile. A positive association was observed between quartiles of SSB and BMI, kg/m² (p<0.001), obesity (p<0.05), and excess weight (p<0.05).

CONCLUSIONS

Consumption of UPP and SSB is associated with a sociodemographic gradient. Our findings highlight the need for an integrated policy approach to promote healthier food environments in Guatemala.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_554

DESPITE ALARMING HOUSEHOLD FOOD INSECURITY, LACTATING MOTHERS CAN MEET THE MINIMUM DIETARY DIVERSITY: A COMMUNITY CROSS-SECTIONAL STUDY IN DEMOCRATIC REPUBLIC OF CONGO

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BACKGROUND AND OBJECTIVES
Lactation is a physiological status that requires high energy to fulfill the nutrient requirements of the mother and child. Several factors can affect maternal nutrient intake and lead to nutritional deficits among lactating mothers. However, studies exploring dietary practices among specific groups, such as lactating mothers (LMs), are limited. Therefore, this study aimed to quantitatively assess the dietary diversity of LMs in a food-insecure setting in the Democratic Republic of Congo (DRC).
METHODS
A community-based cross-sectional survey was carried out in 2024. A stratified multistage sampling technique was used to select 662/670 LM. Data were collected using a pre-tested and structured interviewer-administered questionnaire. Minimum dietary diversity for women (MDD-W) was computed from a single 24-hour recall. A cut-off value of 5 was used to classify the dietary diversity into achieving MDD-W or not. Household food insecurity level was assessed using the Household Food Insecurity Access Scale (HFIAS). Regression logistic was applied to identify associated sociodemographic, economic, and anthropometric factors.
RESULTS
The study recruited 662 LMs aged at least 18 years in western of DRC, 95.5% of whom were residing in severe food-insecure households. The overall minimum dietary diversity (MDD-W) prevalence was 49.4%. The mean dietary diversity score was 5.0 ± 2.8. Vegetables, roots/tubers, red palm oil, sugar/products, and fish were the main food items consumed. The acceptable MDD-W was neither associated with high LMs schooling, high BMI, household food source, high household SES, nor the proper water source.
CONCLUSIONS
Lactating mothers in food-insecure areas can access appropriate dietary diversity. The deepest learning from LM demonstrated good dietary habits is crucial to improving MDD scores in food-insecure settings.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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MEASUREMENT OF TOTAL ENERGY EXPENDITURE, BASAL METABOLIC RATE, BODY COMPOSITION AND PHYSICAL ACTIVITY IN ELDERLY INDIVIDUALS: IMPLICATIONS FOR HEALTHY AGING

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BACKGROUND AND OBJECTIVES
The proportion of elderly will be ~17% of the world's population by 2050. In the elderly, energy intakes are affected and energy expenditure (EE) decreases, along with decline in muscle mass and increase in adiposity. The primary objective of the study was to accurately measure the daily total energy expenditure (TEE), basal metabolic rate (BMR), body composition, and activity energy expenditure (AEE) in free-living, healthy, active, elderly population. The secondary objective was to compare the measured BMR with predicted BMR, derived using the Livingston equation.
METHODS
Healthy, active elderly individuals aged 65-80 years were recruited. Anthropometry, along with measurement of body cell mass (BCM), using a whole-body potassium counter was performed. The TEE and BMR were measured using the double-labelled water technique and indirect calorimetry respectively. AEE was measured using a triaxial accelerometer (GT3X+, Actigraph, USA). Independent t-test was used to assess difference between sexes, and paired t test was used to compare measured and predicted BMR values. Adjusted analyses were performed using multiple linear regression.
RESULTS
The mean age of the 42 participants (22 males and 20 females) was 71.2 ± 4.0 years. In the whole group, the mean body weight (kg), body mass index (BMI) (kg/m2) and % fat mass were 61.0 ± 8.9, 23.5 ± 2.2 and 39.5 ± 6.6 respectively. The mean TEE (MJ/d) was 7.42 ± 1.43, 95% C.I. [6.97, 7.86] and the BMR (MJ/d) was 5.58 ± 0.78, 95% C.I. [5.34, 5.82]. Although males (7.89 ± 1.56) had significantly higher TEE (MJ/d), compared to females (6.91 ± 1.10), when adjusted for age and weight, the significance disappeared. Adjusted for age and weight, BMR was significantly higher in males (6.03 ± 0.73), compared to females (5.11 ± 0.51), $p<0.01$. Significantly higher BCM (kg) and BCM (%) was observed in males (20.6 ± 2.4 kg and 31.6 ± 2.3%), compared to females (16.1 ± 2.2 kg and 28.7 ± 2.8%; $p<0.001$). AEE (MJ/d), adjusted for age, was significantly higher in males 1.39 ± 0.75 (~18% of TEE) compared to females 0.94 ± 0.55 (~14% TEE). In both sexes, the measured BMR was significantly higher compared to the predicted BMR (males: 5.71 ± 0.49 vs females: 4.57 ± 0.39), the underestimation being higher in females (10%).
CONCLUSIONS
Significant sex differences were observed in BMR, body composition, and physical activity among the elderly. The underestimation of the predictive equations for BMR particularly in females, highlights the need for accurate population specific estimates.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_558

MICRONUTRIENT INTAKES AND THE PREVALENCE OF INADEQUATE INTAKES AMONG ADULTS AGED 65 YEARS AND OLDER IN IRELAND: FINDINGS FROM THE NATIONAL ADULT NUTRITION SURVEY II

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BACKGROUND AND OBJECTIVES
Adequate nutrition is important at all life stages with micronutrients having an important role in long term health, cognition and ageing(1). The aim of this study was to estimate the intake of selected micronutrients and prevalence of inadequate intakes in males and females aged 65 years and over from a nationally representative sample of adults in Ireland.
METHODS
Analyses were based on a subsample of older adults (≥65y, *n* 282) from the Irish National Adult Nutrition Survey II (NANS II) (2020-21). Food & beverage intake data (incl. nutritional supplements) were collected via 2x24-hour telephone dietary recalls (≥7 days apart). Older adults were asked to record their foods the day before the recall and all participants were provided with a photographic food atlas. Nutrient intakes were estimated using Nutritics based on UK and Irish food composition data. Usual intakes of micronutrients were calculated via the NCI-method using SAS Enterprise Guide. The prevalence of inadequate intakes of micronutrients (excluding energy under-reporters)(2) was estimated using estimated average requirements (EARs) established by the US Institute of Medicine (IOM) (vitamin D)(3) and the European Food Safety Authority (EFSA) (all others)(4).
RESULTS

	Usual intake of micronutrients Mean (SD)		**% below the EAR**	
	Males	Females	Males	Females
Vitamin A (µg)	960 (896)	899 (841)	12.9	12.9
Vitamin D (µg)	15.9 (10.7)	19.0 (13.0)	55.6	41.4
Riboflavin (mg)	2.8 (2.3)	2.8 (2.3)	24.7	17.7
Vitamin B6 (mg)	2.6 (2.2)	2.4 (2.0)	35.5	23.1
Dietary folate equivalents (µg)	381 (332)	349 (305)	34.3	37.5
Vitamin C (mg)	137 (106)	131 (101)	46.6	40.9
Calcium (mg)	991 (934)	1002 (948)	33.2	29.3
Iron (mg)	11.2 (10.4)	10.0 (9.4)	7.4	12.8
Zinc (mg)	11.7 (10.8)	9.9 (9.2)	48.5	24.2

CONCLUSIONS
These findings indicate that based on current dietary patterns, significant numbers of older adults in Ireland have inadequate micronutrient intakes and highlight the need to investigate targeted dietary strategies to address these low intakes among this population group.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_559

COVERAGE OF AND ADHERENCE TO MICRONUTRIENT SUPPLEMENTS IN PREGNANT WOMEN IN THREE PROVINCES IN THE DEMOCRATIC REPUBLIC OF THE CONGO

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BACKGROUND AND OBJECTIVES
Maternal undernutrition is well-recognized as a driver of poor pregnancy outcomes and growth faltering among infants and children (1). Recent evidence has shown that multiple micronutrient supplements (MMS) containing iron and folic acid (IFA) and 13 other vitamins and minerals are more effective than IFA alone in improving birth outcomes and are equally effective in preventing anemia (2, 3). In the Democratic Republic of the Congo (DRC), 14% of women of reproductive age are underweight (BMI <18.5 kg/m2), and 38% are estimated to be anemic (4). The Ministry of Health is transitioning to provide MMS as the standard of care. MMS is currently being distributed in the DRC in areas where there is poor coverage of IFA, but the levels of coverage and adherence are unknown. The objectives of this study were to: 1) determine the coverage (having taken MMS or IFA at least once during pregnancy) and adherence (the extent to which they are taking it every day as indicated) to MMS and IFA among pregnant women in three provinces of the DRC and 2) assess the factors associated with the coverage of MMS.
METHODS
The study was cross-sectional, with a structured household questionnaire targeting pregnant women. Coverage and adherence were based on women's self-report. Data were collected from April to May 2022. Descriptive analyses were conducted and means/standard deviations for continuous variables and proportions for categorical variables were calculated. Bivariate logistic regression was used to determine any association between socio-demographic variables and the consumption of MMS (compared to MMS non-consumption).
RESULTS
Data were collected from 2,375 pregnant women, out of which 13.8% had consumed MMS only, 25.8% IFA only, 7.7% both MMS and IFA, and 52.7% neither at least once during their pregnancy. Compared to married women, those not married nor cohabitating were less likely to consume MMS (OR: 0.63; CI: 0.44-0.90). Compared to women with no living children, women with 3-4 (OR: 1.62; CI: 1.15-2.29) or ≥5 (OR: 2.39, CI: 1.63-3.52) living children were more likely to consume MMS, as were women living in urban areas (OR: 1.69, CI: 1.19-2.40) compared to rural areas. In addition, 88.3% and 80.8% of women reported consuming MMS and IFA, respectively, almost every day in the previous 30 days.
CONCLUSIONS
In three provinces in the DRC, overall MMS and IFA coverage were low, although a high percentage of women taking the supplements reported taking them daily. Next steps are to explore strategies to improve coverage as part of the government's MMS scale-up plan.

CONFLICTS OF INTERESTS
Kristen Hurley: Funding and material for the study described in this abstract was provided by Vitamin Angels. Dr. Hurley also receives funding from Vitamin Angels to provide technical oversight to programs team. This arrangement has been reviewed and approved by the Johns Hopkins University in accordance with its conflict of interest policies.

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EPO5_560

ASSESSMENT OF THE IMPACT OF THE NEW FRONT-OF-PACKAGE NUTRITION LABELING IN BRAZIL – DEVELOPING A CONCEPTUAL FRAMEWORK

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BACKGROUND AND OBJECTIVES
Several countries are implementing policies to improve food environments and support healthy eating, including food nutrition labeling measures . In Brazil, new regulations for the nutrition labeling of packaged foods, approved in 2020 and enforced in October 2023, include mandatory front-of-package nutrition labeling (FOPNL). This study aimed to develop a conceptual framework to evaluate the impact of the new FOPNL regulation on dietary behaviours, diet and health.
METHODS
The development of the conceptual framework was constructed using the qualitative method proposed by Jabareen (2009), based on a process of theorization using grounded theory methodology, divided in 8 phases. The phases included mapping and extensive reading of the selected data sources, identifying, naming and integrating concepts, synthesizing and validating the conceptual framework. The data sources included scientific papers, reports and policy briefs from international organizations on food nutrition labelling regulation impacts on dietary and health outcomes.
RESULTS
The conceptual model was structured into three main components: a) Exposure: captured consumers' contact with FOPNL regulation, in supermarkets, social media, or print media. This component evaluates attention to FOPNL and consumers' active engagement with the information; b) Cognitive and individual mediators: included sociodemographic factors, nutrition knowledge and attitudes towards food, and family context, which influence how consumers perceive and use FOPNL and changes in knowledge and perception regarding the FOPNL; c) Outcomes: included changes in purchasing behavior, dietary consumption, and ultimate health impacts. The model also accounts for impacts from food reformulation by the food industry.
CONCLUSIONS
The conceptual model provides a robust and integrated conceptual framework for analyzing the impact of FOPNL in Brazil. In addition to mapping the pathways through which FOPNL influences consumer behavior, it also guided the development of research tools, such as the questionnaire with indicators for impact evaluation and contributes to the improvement of labeling policies and the promotion of public health in Brazil.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_561

IS VITAMIN A SUPPLEMENTATION STILL JUSTIFIED? A QUALITATIVE STUDY EXPLORING INSIGHTS FROM POLICY MAKERS AND PROGRAM PLANNERS

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BACKGROUND AND OBJECTIVES
According to the last national survey conducted in 1998, the prevalance of vitamin A deficiency (VAD) was as high as 61% in children under five in the country, leading to the implementation of the vitamin A supplementation (VAS) program. The relevance of the VAS is currently at the centre of a debate. It is important to understand how policy makers and program planners perceive VAS. This study aims to explore insignts of policy and program planners of VAS in the country regarding its relevance and justification.
METHODS
This study used an exploratory qualitative design. Data were collected using key informants' interviews with policy makers and program planners. This study was carried out considering the policy makers and the program planners at the national, provincial and health zone levels and included a total of 25 participants. Data were analysed using a thematic analysis.
RESULTS
The participants recognized the relevance of VAS in reducing morbidity and mortality especially in children. However, there were challenges in communication and delivery mechanism such as insufficient supplement supply and lack of motivation of health providers. The participants opinions diverged for the justification of the VAS. For some participants, VAS was perceived as an essential strategy in the country due to its benefits, while other advocated for alternatives approaches that may be cost-effectiveness such as vitamin A through food. They emphasized the importance of adopting appropriate dietary practices to preserve and enhance the bioavailability of vitamin A in food.
CONCLUSIONS
Although VAS was considered important, our findings highlight the need to investigate alternative approaches, such as promoting vitamin A-rich foods. There is an urgent need for more objective information regarding the vitamin A status in the child population and research on VAD is necessary to evaluate the effect of the VAS
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_562

EFFECT OF ULTRA-PROCESSED FOOD CONSUMPTION DURING ADOLESCENCE AND FOOD ADDICTION IN EARLY ADULTHOOD

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BACKGROUND AND OBJECTIVES
Ultra-processed food (UPF) consumption is associated with poor diet quality and chronic diseases, including obesity, diabetes, and cancer. Short-term exposure to ad libitum UPF diets increases caloric intake by 500 kcal/day, and prolonged exposure may contribute to food addiction (FA), particularly during critical developmental stages. This study examined the association between UPF consumption trajectories during adolescence (i.e., 13 to 16 years of age) and FA in early adulthood (i.e., 20-21 years)
METHODS
A prospective analysis of 488 adolescents from the Growth and Obesity Chilean Cohort Study (GOCS) cohort was conducted. We used dietary intake (24-hour recalls) from 3 evaluations during adolescence; UPFs were classified using the NOVA system, longitudinal data of dietary share of UPF was computed using mixed-effects linear regression models, and participants were grouped into High, Medium, and Low UPF trajectories based on tertiles of each assessment. The presence of FA was evaluated in early adulthood using YFAS 2.0-Chile. Logistic models assessed associations between diet and FA under four adjustments: (1) unadjusted, (2) sociodemographic variables, body mass index, and diet misreporting, (3) childhood eating behavior (CEBQ) and adolescent impulsivity (UPPS-P), and (4) combined covariates from models 2 and 3.
RESULTS
Fifty-three percent of the sample was female. At the beginning of the adolescent follow-up 45% were overweight or obese. During adolescence, the mean intake of UPF according to three dietary evaluations represented 45% of the total calories (range 42-48%). The intake of UPF differed significantly between trajectories (39.7%, 42.8% and 46.3%, $p<0.001$). FA prevalence was 12% in early adulthood. Compared to Low UPF trajectory, High UPF trajectory duplicated FA diagnosis in early adulthood, with borderline significance in fully adjusted models (OR 2.19; 95%CI 0.99–4.82; $p=0.050$).
CONCLUSIONS
These findings emphasize adolescence as a critical window for reducing UPF consumption to prevent FA and other associated health risks. Policies promoting healthier eating behaviors during adolescence are essential for long-term health outcomes.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_563

FACTORS INFLUENCING CHILDHOOD OVERWEIGHT AND OBESITY IN THE PACIFIC ISLANDS: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES
Pacific island health has been influenced by socio-political changes with a rise in obesity in children, currently estimated at 24 to 30 percent. This systematic review examines factors influencing overweight and obesity among children in the Pacific Islands.
METHODS
A systematic search of peer-reviewed literature was conducted in PsycINFO, CINAHL, EMBASE, EBSCO/AGRICOLA, PROQUEST (includes ERIC), Web of Science, MEDLINE/PUBMED- MeSH, Scopus, SPORTDiscus) from inception to April 2024. Eligible studies included children aged birth to 12 years and that measured overweight or obesity with anthropometry in the Pacific Islands. Overweight and obesity prevalence by age and sex only were excluded (n=5). At least two team members screened, extracted, and synthesized data using Covidence, Qualtrics, and Excel, with disagreements resolved by consensus. Factors assessed in studies were grouped by types of influence and levels of the socioecological model (SEM). Quality was assessed with Joanna Briggs Institute (JBI) checklists.
RESULTS
Of 4985 papers identified through screening, 396 full texts were evaluated and 38 studies met criteria. Included studied were assessed as low bias by JBI. Majority were cross-sectional (30/38= 79%), with source data from 1974-2021 from 16 countries or territories - American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia (Chuuk, Kosrae, Pohnpei, Yap), Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, New Caledonia, Palau, Papua New Guinea, Samoa, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis & Futuna, representing more than 122,000 children. Majority were conducted in or included Samoa (n=10) and American Samoa (n=8). Factors influencing overweight and obesity included: Ethnicity (n=6), Socio-Cultural (n=9), Geographic (n=15), Environmental (n=2), Infant Factors (n=6), Maternal Factors (n=7), Maternal Behaviors (n=2), Child Physical Activity level (n=5), Child Feeding and Diet (n=9), and Other Child Health Factors (n=3). Majority of studies focused on factors at the individual level of the SEM (n=30), followed by the interpersonal level (n=17), the community level (n=16), and the organization level (n=2). No studies addressed determinants at the policy level of the SEM.
CONCLUSIONS
Life course studies and actions addressing factors found at multiple SEM levels are needed to ameliorate childhood obesity in the Pacific Islands.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_565

FEASIBILITY OF ADHERING TO A ONE-WEEK DIETARY APPROACHES TO STOP HYPERTENSION (DASH) EATING PLAN AMONG LOW-INCOME WOMEN RECEIVING FEDERAL FOOD ASSISTANCE IN THE UNITED STATES

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BACKGROUND AND OBJECTIVES
Hypertension affects almost half of American adults, with African American women having the highest rates compared to any other racial or ethnicity and biological sex group (1). The Dietary Approaches to Stop Hypertension (DASH) is an evidence-based eating plan for the treatment and/or prevention of hypertension (2). However, increasing food costs may present barriers to follow this heart-healthy eating plan for low-income at-risk populations, especially African American women. In 2022, women living alone made up the largest percentage of nonfamily households in the U.S. (3). This study assessed if an American woman in a one-person household receiving weekly, federal food assistance can afford a one-week DASH eating plan recommended to control, treat, and prevent hypertension.
METHODS
The publicly available, one-week DASH eating plan provided in a publication from the National Heart, Lung, and Blood Institute was used (4). This one-week plan provides a daily 2000-calorie menu for breakfast, lunch, dinner, and snacks with individual ingredients that fit with DASH nutritional guidelines. The cost of each ingredient was searched online during the months of October and November 2024 from two grocery store chains that are commonly utilized among households residing in an urban city of southern U.S. Daily grocery cost in U.S. dollars was calculated based on the type, weight, and cost of each ingredient listed in the DASH plan using Fillet, a user-friendly application used in research and the foodservice industry. The total grocery cost from the one-week plan was compared to the average weekly allotted federal food assistance U.S. dollars provided to eligible low-income women aged 20-50 years, determined by the 2021 U.S. Thrifty Food Plan (5).
RESULTS
Based on the October 2024 average food cost update published online (5), women in a one-person household would receive USD $67.92 per week on average for federal food assistance. In comparison, individuals following the one-week DASH plan would spend about USD $290 towards groceries initially, including condiments, spices, fruit juices, oil, nuts, and seeds that could last up to a month. The cost of this recommended DASH plan is more than four times greater than the average weekly federal food assistance U.S. dollars provided to a woman single-handedly experiencing challenges with food and nutrition security.
CONCLUSIONS
Findings suggest that adherence to the one-week DASH plan is not feasible for single American women receiving federal food assistance. Future research should explore ways to reduce costs and assess the cultural relevance of the one-week DASH eating plan.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_566

THE STATE OF ANEMIA AMONG SENEGALESE WOMEN OF REPRODUCTIVE AGE AND CHILDREN 6-59 MONTHS OLD

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BACKGROUND AND OBJECTIVES
Globally, anemia is a major public health problem among vulnerable groups such as women of reproductive age (WRA) and children aged 6-59 months (C6-59m). As the World Health Organization's (WHO) global target term for anemia (2025) approaches, Senegal does not have recent data to assess its progress, or the impact of the strategies implemented to date to address the problem. This study aimed to assess the prevalence of anemia among Senegalese WRA and C6-59m.
METHODS
One WRA and C6-59m were sampled from each household targeted through a stratified three-stage sampling method in a national cross-sectional survey on anemia among adolescents (10-19 years). Sociodemographic and socioeconomic data were collected. Hemoglobin concentration (Hb) was measured using an HemoCue® Hb 301 photometer. Hb cut-off defining anemia and its public health significance were from WHO's 2011 guidelines for comparability with former surveys. Data were weighted to account for the design complexity.
RESULTS
Data from 1,729 WRA and 841 children were analyzed. Mean Hb was 11.8±1.6 g/dL among WRA, and the prevalence of anemia was 47.6%. The prevalence of anemia was low among WRA aged 15-19, and 40-44 years compared with other age groups, except for 25-29 years ($P < 0.001$). The prevalence of anemia was higher among WRA living in households in the lowest wealth quintile (57.6%) compared with the second and middle ones (46.7% and 36.0%, respectively), $P < 0.05$). Among C6-59m, mean Hb was 10.5±1.5 g/dL. The prevalence of anemia was 59.8%, higher in children aged 24-35m (73.7% versus. 55.7% in other age groups, P=0.04), those living in rural areas (66% versus 50.3% in urban areas), in households in the lowest and second quintiles (71.7% and 68.5%, respectively). C6-59m living in the country's western area were least affected by anemia (43,1%) than those in other ethnocultural areas (67,5%, $P<0.05$). Mild and moderate anemia were more common than did severe anemia in both women and C6-59m.
CONCLUSIONS
Anemia remains a severe public health problem among both WRA and C6-59m in Senegal. Its prevalence differs according to specific socio-demographic and socio-economic characteristics. These RESULTS confirm that the country is not on track to meet the 2025 WHO's global target for anemia and probably needs to review its anemia control strategies.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_567

SURVEY ON AWARENESS OF BREAST CANCER PREVENTION INFORMATION RELATED TO DIET AND NUTRITION IN TOKYO

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BACKGROUND AND OBJECTIVES
The objective was to conduct awareness activities about lifestyle habits considered to be related to breast cancer incidence, based on nutritional epidemiological evidence, and to analyze the awareness by gender and age group to aid in the dissemination of breast cancer prevention information.
METHODS
We displayed posters to introduce lifestyle habits related to diet and nutrition reported as risk/preventive factors for breast cancer, excerpted from sources such as the "World Cancer Research Fund Report" and "RESULTS from representative Japanese cohort studies". Simultaneously, awareness was surveyed among those who agreed to participate in the questionnaire. The questionnaire included: ① Breast cancer incidence rate among Japanese women(ref.1) ② Excessive alcohol consumption (ref.2) ③ living with overweight or obesity in young adulthood decreases the risk of pre-menopausal breast cancer(ref.3). ④ Postmenopausal weight gain(ref.3) ⑤ Miso soup (isoflavones)(ref.4) ⑥ Physical activity(ref.2) ⑦ Breastfeeding(ref.2). Statistical analysis was performed using the $\chi 2$ test by gender and age. P value < 0.05 was considered statistically significant.
This survey was approved by the ethics review committee of Japan Women's University (No. 621).
RESULTS
Of the 1,283 individuals who agreed to participate in the questionnaire, 1,199 individuals (388 males, 811 females) with the information of gender and age were included. Awareness rates were 32.1% for ⑤, 31.2% for ①, 30.6% for ②, 27.3% for ⑦, 23.0% for ⑥, 21.3% for ④, and 16.9% for ③.
CONCLUSIONS
The awareness of information on breast cancer prevention, which may be related to food and nutrition, ranged from 16.9 to 32.1%.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_568

RESEARCH TO DEVELOP A SELF-ASSESSMENT SCALE FOR PUBLIC HEALTH DIETITIANS WHO ARE EXPECTED TO PLAY A SUPERVISORY ROLE

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BACKGROUND AND OBJECTIVES
In recent years, nutrition policies have been promoted in various fields. Moreover, the presence of public health dietitians who play a supervisory role is expected to become more important in the future. However, few tools have been developed to enable public health dietitians who are expected to play a supervisory role to evaluate their own skills and other aspects. This study aimed to (1) review previous studies on the supervisory roles of other health professions in public health and self-assessment scales, (2) conduct a qualitative survey of public health dietitians who have supervisory roles, and (3) develop a draft self-assessment scale for public health dietitians who are expected to play supervisory roles.
METHODS
(1) Review previous studies on the supervisory role of other health professions (physicians, public health nurses, and so on) in public administration and evaluation scales, and survey the literature on scale development. (2) Conduct a qualitative study of public health dietitians with supervisory roles. Interviews were conducted with public health dietitians who have a supervisory role, the next generation of public health dietitians with a supervisory role, and supervisory public health nurses. (3) Consideration will be given to developing a draft self-assessment scale for public health dietitians who are expected to play a supervisory role.
RESULTS
(1) A total of 168 articles were extracted from medical journals, 11 articles from CiNii in Japanese and 14 articles in English, and 13 articles from Google Scholar. The exclusion criteria were those that were targeted at non-governmental organizations, those that did not seem to be related to human resource development, and others that were deemed not to be in line with the purpose of this study. (2) Interviews were conducted with public health dietitians with supervisory roles in several municipalities, dietitians with next-generation supervisory roles, and supervisory public health nurses to extract key words and essences for the development of a self-assessment scale for dietitians with supervisory roles. (3) We collected information on evaluation scales and contents that could be utilized for the scales, and organized perspectives on the proposed scales. In addition, we examined proposed validity verification methods based on past research.
CONCLUSIONS
It led to the development of a self-assessment scale for public health dietitians who are expected to play a supervisory role. This research was supported by a Grant-in-Aid for Scientific Research on Health, Labor and Welfare #24FA1010.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_569

CHARACTERISTICS OF INDEPENDENT EATING BEHAVIOR IN CHILDREN AT HOME RELATED TO INTERNATIONAL EDUCATION IN INTERNATIONAL PRESCHOOLS IN JAPAN

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BACKGROUND AND OBJECTIVES
This study aims to identify the characteristics of independent eating behavior (IEB) associated with international education in international preschools in Japan.
METHODS
Data were collected from a 2024 survey on eating habits conducted at eight international preschools and one private kindergarten in Japan. The study targeted 359 parents of children aged 3–5 years. The survey included questions on demographics, a modified IEB scale for preschool children (adapted from an elementary school version), 16 items on interest in international understanding, and an independence and cooperativeness scale for preschool children. Parents responded on behalf of their children. Associations between the modified IEB scale and other items were analyzed using Spearman's rank correlation coefficient (*r*s).
RESULTS
The survey had 148 respondents (41.2% cooperation rate). A modified IEB scale for preschoolers, comprising 12 items grouped into three subscales, was developed: "Factor 1: communication about foods," "Factor 2: preparing and cleaning up after meals, and appreciation," and "Factor 3: eating manner." Correlation analysis of data from 93 children in international preschools revealed positive associations between scores on the modified IEB scale and items related to international understanding, including "global issues" (3 items), "foreign language" (4 items), "international exchange" (5 items), and "cross-cultural experience" (3 items) (*r*s=0.21–0.39, $p<0.05$). Twelve items were positively correlated with the total score of Factor 1 (*r*s=0.22–0.34, $p<0.05$). The item "Your child wants to eat traditional cuisines from different countries" was positively associated with scores across all three subscales of the modified IEB scale (*r*s=0.21–0.34, $p<0.05$). Additionally, two items, each from "foreign language" and "international exchange," were positively correlated with the total score of the independence and cooperativeness scale (*r*s=0.22–0.23, $p<0.05$).
CONCLUSIONS
Independent eating behaviors in children attending international preschool were linked to aspects of international education. Communication about foods was associated with interest in international understanding. Assisting with meals, showing appreciation, and demonstrating proper eating manners were connected to experiences of cross-cultural engagement.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_570

DEVELOPMENT OF A JAPANESE VERSION OF THE NUTRITIONAL STATUS SCREENING QUESTIONNAIRE -A REVIEW OF THE VALIDITY OF THE DRAFT QUESTIONNAIRE'S CONTENT BY EXPERTS-

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BACKGROUND AND OBJECTIVES
A prominent assessment tool used to screen for nutritional risks, such as eating habits that may affect physical development, is the Nutrition Screening Tool for Every Preschooler (NutriSTEP), which has been developed in Canada. However, since the living environment and eating habits of parents and children differ greatly depending on the social environment and culture of each country and region, it is necessary to develop a unique assessment tool suitable for Japanese, and there is no similar tool that has been sufficiently validated in Japan. Therefore, we have been developing a simple tool to screen nutritional risk of preschool children in Japan since 2021. The purpose of this study is to determine the validity of the draft questionnaire we developed for a simple assessment of the nutritional status of preschool children.
METHODS
A total of 12 experts, including physicians, registered dietitians, public health nurses, epidemiologists, nursery teachers, and kindergarten teachers, were asked to evaluate and comment on each item of the draft questionnaire used in the simplified tool (for children aged 1 year 6 months to under 3 years and 3 to 5 years). The evaluation items were: 1) relevancy (1-not relevant, 2-items need modification, 3-relevant but needs some modification, 4-very relevant), 2) clarity (whether the questionnaire items are clear or not 1-not clear, 2-items need modification, 3-clear but needs some modification, 4-very clear), 3) simplicity (1-not easy, 2-items need revision, 3-easy but needs some revision, 4-very easy), with a score of 4 points for each indicator. In addition, after obtaining free-text responses for the entire questionnaire, the content validity index (CVI) of the content was calculated.
RESULTS
The CVI ranged from 0.83-1.00 for both the questionnaire for children aged 1 year 6 months to less than 3 years and the questionnaire for children aged 3 to 5 years, which was considered acceptable and valid as an index. In addition to the scores, the project members discussed and improved the tool based on the free-response statements.
CONCLUSIONS
The RESULTS showed that the questionnaire was highly valid, and further improvements were possible, leading to the next step of focus group interviews. The questionnaire could be further improved, leading to the next step of focus group interviews.
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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_571

DISTORTED BODY IMAGE AND DESIRE FOR THINNESS AMONG UNDERWEIGHT AND NORMAL WEIGHT JAPANESE FEMALE HIGH SCHOOL STUDENTS

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BACKGROUND AND OBJECTIVES
The prevalence of underweight among young Japanese women is remarkably high. Many young women, even those who are underweight or normal weight, perceive themselves as overweight and have a desire for thinness. Few studies have examined this issue among high school students. The purpose of this study was to describe body perception and the desire for thinness among underweight and normal weight female high school students in Japan.
METHODS
A questionnaire survey was conducted among female high school students in Tochigi Prefecture. Weight status was classified based on body mass index (BMI) into two groups: underweight (BMI < 18.5) and normal weight (18.5 ≤ BMI < 25). Individuals with a BMI of 25 or higher were excluded. The underweight group was further divided into three categories: grade I (17 ≤ BMI < 18.5), grade II (16 ≤ BMI < 17), and grade III (BMI < 16). Regarding the assessment of the desire to lose weight, participants were asked "Do you want to lose (or gain) weight now?", and chose from the following categories: want to lose weight, want to stay the same, want to gain weight, or don't know. The body perception and desire to lose weight were described across weight status.
RESULTS
In the normal weight group, 66% perceived themselves as slightly overweight or overweight. In the underweight group (grades I–III combined), 67% did not perceive themselves as underweight. When analyzed by grades, 75% in grade I, 42% in grade II, and 29% in grade III did not perceive themselves as underweight. The prevalence of the desire for thinness was 42% and 84% of the underweight group and the normal weight group, respectively. Within the underweight group, the desire to lose weight was observed in 48% of grade I, 20% of grade II, and 29% of grade III.
CONCLUSIONS
This study reveals that distorted body image and desire to lose weight were prevalent among underweight female high school students. Approximately 50% of individuals classified as Grade 1 underweight revealed a desire to lose weight. Furthermore, even among those with severe underweight status (BMI < 17), some still have a desire for further weight loss. Promoting accurate body perception and addressing psychological factors behind the desire for thinness may be necessary for health education and nutrition counselling.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_572

ULTRA-PROCESSED FOOD CONSUMPTION AND MICRONUTRIENT INTAKES OF KOREAN YOUNG ADULTS

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BACKGROUND AND OBJECTIVES
Changes in food production and consumption patterns worldwide have led to an increase in the consumption of ultra-processed foods, which have been reported to be associated with poor nutrient intake and dietary quality. As ultra-processed foods, increased intake of carbohydrates, sugars, total fat, saturated fat, and sodium, while decreased intake of protein, fiber, and potassium have been reported. However, limited studies have reported on the association of ultra-processed food intake with micronutrient intake, such as vitamins and minerals. The purpose of this study was to investigate the association between ultra-processed food consumption and dietary quality focus on micronutrients in young adults.
METHODS
Among 468 Korean adults in their 20s and 30s, dietary intake survey was conducted using 24-h recall method from November 2022 to June 2023. Daily intakes of energy and nutrients, including vitamins and minerals, were analyzed using CAN-Pro (The Korean Nutrition Society, Seoul, Korea), and ultra-processed food intake was calculated using the NOVA food classification criteria. The subjects were categorized into two groups: those with more than 25% of ultra-processed food intake to total food intake (≥25% group) and those with less than 25% (<25% group). Differences of variables between two groups were verified by the unpaired t-test using SAS version 9.4, and significance was tested at the $p<0.05$.
RESULTS
Ultra-processed food intake of the subjects was 24.4% of total food intake and 26.0% of total energy intake. Daily energy and sodium intakes were higher in the ≥25% group than the <25% group. Ultra-processed food intake was significantly negatively associated with intakes of dietary fiber, protein, fat, and cholesterol after adjusting for covariates. Daily intakes of fiber and micronutrients, such as vitamins (vitamin A, vitamin E, vitamin K, folate, and vitamin C) and minerals (potassium and zinc), were lower in the ≥25% group than the <25% group. In addition, ultra-processed food intake was significantly negatively associated with intakes of vitamin A, vitamin E, vitamin K, phosphorous, potassium, magnesium, zinc, and iodine after adjusting for covariates.
CONCLUSIONS
These RESULTS advocate for association increased consumption of ultra-processed foods with lower overall dietary quality. Future studies are needed to clarify a causal association between ultra-processed food intake and dietary quality focus on micronutrient intakes.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_574

OPTIMIZATION AND ORGANOLEPTIC EVALUATION OF NUTRIENT-DENSE COMPLEMENTARY FOOD MIXES USING D OPTIMAL MIXTURE DESIGN: ALIGNING WITH REVISED NATIONAL FOOD SECURITY ACT STANDARDS, INDIA

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BACKGROUND AND OBJECTIVES
Proper nutrition during infancy is essential for growth and development. Complementary feeding meets the energy and nutrient needs of children 6–24 months beyond breast milk. This study optimized a nutrient-dense complementary food for children 6–35 months using locally sourced ingredients and a mixture design approach, to meet the Nutrition norms for Poshan 2.0 Program under the Schedule II of National Food Security Act, India to improve infant and young child feeding nutrition.
METHODS
The formulation was optimized using Stat-Ease Design-Expert® software (version 13) with a Mixture Design and special cubic model, incorporating wheat, pulses, milk powder, nuts/seeds, and plant-based oil. Constraints aligned with Poshan 2.0 and NFSA norms in India, targeting maximum nutrient content (iron, calcium, zinc) and minimal phytate-to-mineral molar ratios. The optimized mix served as a base for diverse product variations to enhance palatability and reduce monotony: Variation 1 (dry dates powder), Variation 2 (low refined sugar per WHO guidelines), and Variation 3 (spices/condiments). Sensory evaluation by 20 semi-trained panelists using a nine-point hedonic scale (acceptability >6) compared the variations to Telangana's "Balamrutham."
RESULTS
The optimized formulation consisted of 48g wheat, 24g pulses, 10g milk powder, 5g groundnuts, 5g gingelly seeds, and 8g of plant-based oil. The nutrient content per 100g of the formulation was as follows: iron content was 4.40 mg (73.3% of the Estimated Average Requirement, EAR), calcium content was 198.51 mg (49.7% of EAR), and zinc content was 2.78 mg (98% of EAR), all while maintaining acceptable phytate-to-mineral molar ratios. Among product variations, all three variations scored above the acceptability threshold during sensory evaluations, with "Variation 3: Spices/Condiments" receiving the highest preference (score 7.45). The date powder-based formulation of (score 7.05) showed similar acceptability to refined sugar (score 7.1), with the added benefit of enhancing the nutritional profile of the product. The control product, *"Balamrutham,"* achieved a score of 7.64
CONCLUSIONS
This study developed nutrient-dense complementary foods for children 6–35 months, meeting national standards. The formulations provided essential micronutrients, optimal phytate-to-mineral ratios, and high sensory acceptability using locally sourced ingredients, offering a sustainable solution to malnutrition in India.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_575

RELATIONSHIPS BETWEEN CHEWING HABITS AND DIETARY AND LIFESTYLE HABITS IN ELEMENTARY SCHOOL CHILDREN

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BACKGROUND AND OBJECTIVES

Experimental studies suggest that chewing benefits digestion and positively impacts mental and physical health. We conducted a questionnaire survey to clarify the relationships between chewing habits and dietary habits, as well as between chewing habits and aspects of school life, including mental states, learning attitudes, and sports habits.

METHODS

A questionnaire survey regarding lifestyle and eating habits was provided to upper-grade elementary school children from Osaka and Hyogo prefectures, and 592 participants (294 boys and 298 girls) who returned valid responses were included in the analyses. The relationships between chewing habits and dietary habits, learning attitudes, and sports enjoyment were examined using $\chi 2$ and logistic regression analyses.

RESULTS

Children who chewed well consumed more vegetables and fruits, fewer sweet drinks, and had more interest in cooking and healthy foods than those that chewed less. They exhibited better learning attitudes, more stable mental states, and greater sports enthusiasm, suggesting a better overall school life. Logistic regression analysis was used to clarify the factors related to chewing habit in dietary and life style habits. As a result, there were significant relationships between chewing habits and vegetable and fruit intake($p<0.001$), interest in cooking($p<0.001$), learning attitude($p=0.014$), and enthusiasm for sports($p=0.044$). Gender was not related to chewing habits, although girls tended to chew better than boys, and more interested in cooking and healthy foods than boys. Thus vegetable and fruit intake and interest in cooking may promote positive chewing habits, leading to positive learning attitudes and sports enthusiasm in elementary school children. Increased chewing is inferred to contribute to a positive school life.

CONCLUSIONS

This study suggests that promoting positive chewing habits among elementary school children by providing vegetables and fruits and encouraging interest in cooking can improve learning attitudes and sports enjoyment, contributing to a good school life.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_576

ASSOCIATIONS OF GLYCEMIC INDEX AND GLYCEMIC LOAD WITH METABOLICALLY HEALTHY AND UNHEALTHY OBESITY IN THE FILIPINO WOMEN'S DIET AND HEALTH STUDY (FILWHEL)

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BACKGROUND AND OBJECTIVES

Glycemic index (GI) and glycemic load (GL) are important indicators for assessing the quality of carbohydrates in diets. However, their associations with metabolically healthy obesity (MHO) and metabolically unhealthy obesity (MUO) remain unclear. This study investigated the cross-sectional associations of dietary GI and GL with metabolic obesity phenotypes among Filipino immigrant women in Korea.

METHODS

A total of 571 Filipino women married to Koreans were included in this cross-sectional analysis from the Filipino Women's Diet and Health Study (FiLWHEL). Dietary intake was assessed using a 24-hour recall method. Blood samples were taken from participants who had fasted for at least eight hours. Dietary glycemic load (DGL) was calculated by multiplying the GI value of each food by the amount of carbohydrates consumed from each food, summing these values, and dividing the total by 100. Participants were classified into MHO and MUO based on body mass index (BMI) and metabolic health indicators. MHO was defined as meeting at least four of the following five criteria: HOMA-IR ≤ 2.7, hs-CRP ≤ 3.0 mg/L, triglycerides ≤ 150 mg/dL, LDL-C ≤ 100 mg/dL, and HDL-C ≥ 50 mg/dL. Polytomous logistic regression was used to calculate odds ratios (ORs) and 95% confidence intervals (CIs) for the associations of dietary GI and GL with obesity categories.

RESULTS

The mean ± SD of dietary glycemic index (DGI) was 59.6 ± 6.3, and dietary glycemic load (DGL) was 149.2 ± 34.6. Statistically significant associations were not found between DGI or DGL and the prevalence of MHO or MUO. For DGI, ORs (95% CIs) for MHO were 0.77 (0.41–1.46) and 0.62 (0.31–1.23) for subsequent tertiles, using the 1st tertile as the reference (p for trend = 0.17); and ORs (95% CIs) for MUO were 0.77 (0.45–1.32) and 0.73 (0.42–1.28) for subsequent tertiles (p for trend = 0.26). For DGL, ORs (95% CIs) for MHO were 0.69 (0.34-1.39) and 0.96 (0.51-1.83) for subsequent tertiles (p for trend = 0.90); and ORs (95% CIs) for MUO were 1.49 (0.86–2.57) and 1.10 (0.62-1.94) for subsequent tertiles (p for trend = 0.70). Additionally, no significant associations were observed between carbohydrate intake or the percentage of energy from carbohydrates and MHO or MUO.

CONCLUSIONS

No significant associations were found between glycemic index (GI) or glycemic load (GL) and the prevalence of metabolically healthy obesity (MHO) or metabolically unhealthy obesity (MUO) in this study.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_578

CAN VEGETARIAN DIETARY PATTERNS PROVIDE ADEQUATE PROTEIN BALANCE AND BIOAVAILABILITY FOR HEALTHY ADULTS?

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BACKGROUND AND OBJECTIVES
Interest in plant-based diet models is increasing day by day due to reasons such as having a low ecological footprint, being economical, ensuring animal welfare and positive health effects. However, the lower protein content per serving in plant-based sources, their limited amounts of certain essential amino acids, and reduced digestibility raise concerns about whether such diets can ensure adequate protein balance and amino acid bioavailability. The aim of this study is to examine whether vegetarian and vegan diets provide adequate protein balance and amino acid bioavailability in healthy adults.
METHODS
To investigate this, the Web of Science, PubMed, Scopus, and Cochrane databases were searched for studies published in the last five years on vegetarian diet models and protein balance. Only research articles involving healthy adults were included in the study, and studies involving children, the elderly, various diseases and special conditions (e.g., pregnancy and athletes), congress abstracts, protocols and study records were excluded.
RESULTS
A total of 353 studies were reached. As a result, 18 studies were included in this review. Most of the studies focused on vegan individuals and evaluated protein intake. The findings indicate that the daily recommended protein intake can be achieved with vegetarian and vegan diets. However, insufficient protein intake may occur among vegan individuals with inadequate energy intake or those who rely on a limited variety of protein sources. It has been determined that even if sufficient protein intake and diversity are provided in vegans, the recommended intake level for some essential amino acids, especially lysine, may not be reached.
CONCLUSIONS
It is essential for individuals following or considering vegetarian or vegan diets to have sufficient knowledge or receive nutritional counseling on plant-based protein sources, suitable food preparation and cooking methods, and strategies to ensure protein diversity to meet daily requirements. While current studies focus primarily on protein intake, there is a lack of research on amino acid bioavailability. Further studies on this topic are needed.

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The authors have no conflict of interest.

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EPO5_579

DIETARY VITAMIN K INTAKE IN RELATION TO SKELETAL MUSCLE MASS AND STRENGTH AMONG ADULTS: A CROSS-SECTIONAL STUDY BASED ON NHANES

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BACKGROUND AND OBJECTIVES
Previous studies revealed that vitamin K might help maintain muscle homeostasis, but this association has received little attention. We aimed to explore the associations of vitamin K intake with skeletal muscle mass and strength.
METHODS
We included cross-sectional data from the U.S. National Health and Nutrition Examination Survey (NHANES, 2011-2018). Vitamin K intake was assessed via 24-hour recall. Covariate-adjusted multiple linear regression and restricted cubic splines were used to evaluate the associations of dietary vitamin K intake with skeletal muscle mass and strength, measured by dual-energy X-ray absorptiometry and handgrip dynamometer, respectively.
RESULTS
Dietary vitamin K intake was positively associated with skeletal muscle mass in males (β=0.05747, *P*=0.0204) but not in females. We also revealed a positive association between dietary vitamin K intake and handgrip strength within the range of 0-59.871 μg/d (*P*nonlinear=0.049). However, beyond this threshold, increasing vitamin K intake did not cause additional handgrip strength improvements.
CONCLUSIONS
We provided evidence for a positive relationship between dietary vitamin K intake and skeletal muscle mass in males. Moreover, our study revealed a nonlinear relationship between dietary vitamin K intake and handgrip strength, highlighting an optimal intake range.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_580

IMPLEMENTATION OF A STUDENT CITIZENS' ASSEMBLY TO CO-CREATE NUTRITION INTERVENTIONS IN HIGHER EDUCATION SETTINGS

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BACKGROUND AND OBJECTIVES
Higher education offers unique opportunities to promote healthy and sustainable diets among young adults. Engaging students in developing nutrition interventions is crucial to design relevant interventions addressing diverse dietary habits and their complex determinants. Citizens' assemblies increasingly serve as deliberative processes to co-create solutions to complex challenges. This study aimed 1) to design and implement a student citizens' assembly using participatory research methods, 2) to analyze the proposals in light of the main known determinants of the population's diet.
METHODS
This student citizens' assembly took place in November 2024 at a French university located in a disadvantaged area, with the aim to co-create concrete proposals likely to enhance students' access to healthy, sustainable diets. The student citizens' assembly gathered students who were randomly selected out of a pool of volunteers. The students put forward proposals after deliberations among themselves and with a co-creation team of academic and non-academic local partners involved in student life, nutrition, campus food distribution, or public policies. Students voted anonymously on each proposal (0 to 10-point Likert scale). Proposals were categorized into individual, interpersonal, environmental and policy interventions, according to the DONE framework.
RESULTS
Out of 140 students who volunteered to participate in the assembly, 95 students were randomly selected and invited to participate, 35 agreed to participate, and 27 actually took part in the assembly (48% women). The participation rate was 96%, 96% and 93% during the three assembly days. Among the 42 proposals made by the student citizens' assembly, 31 were related to diet, of which six were individual-level interventions (e.g. designing a digital guide with recipes and grocery shopping lists), two were interpersonal-level interventions (e.g. creating spaces and opportunities for conviviality within campuses) and 23 were environmental-level and policy interventions (e.g. extending the opening hours of the university restaurant so that students can have dinner there). Among the 10 most supported proposals, 9 were environmental and policy interventions.
CONCLUSIONS
Student citizens' assemblies are feasible and likely to result in diverse proposals that can be implemented at the individual, interpersonal, environmental and policy levels. Next steps will be to evaluate whether participating in this assembly changed students' dietary habits, knowledge and citizen practices.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_581

FACTORS INFLUENCING FRUIT INTAKE AMONG YOUNG ADULTS IN URBAN AND SUBURBAN AREAS, JAPAN

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BACKGROUND AND OBJECTIVES
According to the 2023 National Health and Nutritional Survey, the average amount of fruit consumed per day per person in Japan was 88.4g, and the data indicated that the average fruit intake across most age groups fell below the recommended daily intake of 200 grams per day, as stipulated by the Ministry of Health, Labour and Welfare. Notably, the intake of those in their 20s and 30s was reported to be the lowest compared to other age groups. The aim of this study was to clarify the factors influencing fruit intake among young people.
METHODS
A cross-sectional study was conducted between October and November 2024, targeting men and women in their 20s and 30s living in F City and its suburbs.Snowball sampling was employed to collect data using an electronic questionnaire. The questionnaire comprised 7 items on 'health orientation', 5 items on 'economic orientation', 7 items on 'convenience orientation', and 6 items on 'food environment', as well as self-reported daily vegetable intake. The responses were made on a 5-point scale.After univariate analysis, multiple regression analysis was employed to examine the influencing variables on fruit intake. The study was approved by the IRB of Nakamura Gakuen University (ETI-24-010).
RESULTS
A total of 199 valid responses were obtained. The median (Q1, Q3) of the self-reported intake of fruit was 100 (30.0, 150.0) g. Of the subject attributes, only 'gender' demonstrated a significant relationship with fruit intake ($p < 0.001$). Significant associations were identified in the 'health-consciousness' ($p < 0.001$), 'convenience-consciousness' ($p = 0.010$), and 'food environment' ($p < 0.001$) groups with fruit intake in univariate analysis, but not in the 'economic-consciousness' ($p = 0.467$) group. The findings of the multiple regression analysis indicated that the 'food environment group' (β [standardised coefficient] = 0.180, $p = 0.010$) and 'gender' (β = 0 .180, $p = 0.012$) were indicated to exert a substantial influence on fruit intake, followed by the influence of 'convenience orientation' (β = -0.152, $p = 0.027$). Conversely, no significant effect was observed for 'health orientation' (β = 0.134, $p = 0.057$) or 'economic orientation' (β = 0.028, $p = 0.696$) on fruit intake. There was no evidence of multiple collinearity between variables.
CONCLUSIONS
The present study suggested food environment and gender are the major factors influencing fruit intake among young people in Japan, while the influence of personal economic orientation on fruit intake was not significant.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_582

TRANSFORMING SOUTH AFRICA'S FOOD ENVIRONMENT: PRESENT PRACTICES AND FUTURE PROSPECTS IN FOOD LABELLING REGULATION

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BACKGROUND AND OBJECTIVES
South Africa's nutrition landscape has undergone significant changes, resulting in a significant nutrition transition characterized by the coexistence of undernutrition, obesity, and nutrition-related non-communicable diseases. In April 2023, the Department of Health introduced the draft food labelling and marketing Regulation (R3337) to foster a healthier food environment. However, its potential impact remains uncertain. This study aimed to evaluate the possible effects of the draft regulation on pre-packaged foods and non-alcoholic beverages sold in South African supermarkets between 2020 and 2024.
METHODS
Pre-packaged food and non-alcoholic beverages from four South African supermarkets were selected using predefined criteria. Nutrient profiling models described in the draft Regulation (R3337) were applied to classify the healthiness of pre-packaged foods and non-alcoholic beverages. Descriptive statistics were used to describe nutrient content and the proportion of foods identified as less healthy, thus requiring mandatory front-of-package warning labels and being restricted from marketing to children. Cohen's κ (coefficient) was employed to assess the agreement between the draft regulation and the South African Food-Based Dietary Guidelines (SAFBDGs).
RESULTS
A total of 1,355 pre-packaged foods were analysed, with 79% classified as less healthy. Notably, 74% of non-alcoholic beverages and 54% of dairy products marketed to children contained artificial sweeteners. Substantial agreement ($\kappa > 0.61$) was observed between the draft regulation and the SAFBDGs for most food groups, except dairy, which showed only fair agreement ($\kappa = 0.35$).
CONCLUSIONS
Mandatory government-led food labelling and marketing regulations have the potential to guide healthier consumer choices and incentivize reformulation and improved packaging of pre-packaged foods. These findings provide valuable insights into establishing validity and support for proposed nutrition policies such as the draft Regulation (R3337).
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_583

PROBIOTIC-ASSISTED BISMUTH QUADRUPLE THERAPY FOR GASTROINTESTINAL SYMPTOMS OF HELICOBACTER PYLORI INFECTION:A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
To assess the effect of multiplex probiotic-assisted bismuth quadruple therapy on gastrointestinal symptoms during the treatment of people with Helicobacter pylori infection.
METHODS
This randomized, double-blind, placebo-controlled study recruited 174 adult H. pylori-infected patients aged 17 to 60 years who met the nadir criteria between July 2022 and December 2023, and randomized them into an intervention group (n = 89) and a placebo group (n = 85) to receive a 2-week bismuth quadruple therapy adjuncted by a 4-week multiplex probiotic preparation or a placebo. General demographic information of the study participants was collected through an electronic questionnaire;gastrointestinal symptoms were assessed by the Gastrointestinal Symptom Rating Scale (GSRS) and the Bristol Stool Classification Scale (BSFS). The observational indicators in this study included the occurrence and improvement of gastrointestinal symptoms in the study population at 2, 4, and 8 weeks of intervention, the type of feces in the study population, and the eradication rate of H. pylori in the study population. Intention-to-treat and Per-protocol analyses were performed.
RESULTS
(1) After intervention, GSRS scores for all dimensions and total scores decreased compared to pre-intervention. At 2 weeks of intervention, the reflux syndrome score ($P = 0.025$) was reduced to a much greater extent than in the placebo group. At 4 weeks of intervention, the GSRS total score ($P = 0.018$) and diarrhea syndrome score ($P = 0.014$) were reduced to a much greater extent than in the placebo group. At 8 weeks of intervention, the GSRS total score ($P = 0.023$) and dyspepsia score ($P = 0.017$) were reduced to a much higher degree than that of the placebo group, while the reduction in the scores of the remaining dimensions was not statistically significant between the two groups. (2) At 4 and 8 weeks of intervention, probiotics had a favorable protective effect on the occurrence of gastrointestinal symptoms. (3) After the intervention, both diarrhea-type and constipation-type feces decreased in both groups from the baseline level. (4) The difference in H. pylori eradication rates between the two study groups was not statistically significant.
CONCLUSIONS
Probiotic-assisted bismuth quadruple therapy clearly improved gastrointestinal symptoms in patients during H. pylori eradication therapy, but the effect of probiotics on H. pylori eradication rate was not observed.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_584

INFANT GROWTH AND BODY COMPOSITION AT 12 MONTHS OF AGE IN RELATION TO AGE OF INTRODUCTION OF COMPLEMENTARY FEEDING: A PROSPECTIVE LONGITUDINAL COHORT STUDY

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BACKGROUND AND OBJECTIVES
The optimal age of the introduction of complementary feeding (CF) is the subject of ongoing research, e.g., whether introduction around 3-4 months of age may increase the risk of childhood overweight. Current evidence suggests no clear association of the timing of introduction of CF with growth and adiposity. Our aim was to investigate infant growth and body composition at 12 months of age in relation to introduction of complementary feeding at 3-4 months vs. 6 months.
METHODS
This study included infants exclusively breastfed (EBF) until 6 months (EBF cohort, n=50) and infants exclusively breastfed until 3-4 months, and receiving complementary foods in addition to breastmilk at 6 months (CF cohort, n=50). Dietary intake was assessed for 72 consecutive hours at 6, 9 and 12 months with weighed food records and test-weighing of infants. Anthropometry data from birth to 12 months from health records were converted to WHO z-scores. At 12 months, body composition was assessed by deuterium dilution. The study was registered at: https://clinicaltrials.gov/ct2/show/NCT02586571.
RESULTS
At 6 months, CF infants received 62% of total energy from breast milk, 26% from baby porridge and other commercial baby products and 13% from other foods. At 9 and 12 months, breast milk intake was higher in the EBF cohort (medians: 363 and 93 g/d, respectively) than the CF cohort (88 and 0 g/d), while the CF cohort received more energy from other foods and drinks. Total energy, protein and carbohydrate intake did not differ between the cohorts. Both infant cohorts showed normal growth in the first year of life relative to the WHO Child Growth Standards as all measured values were within 2 SD of the mean. From birth until 3 months of age, weight-for-age z-score decreased in both cohorts, with a significantly greater decrease in the CF than EBF cohort (mean difference (95% CI): 0.41 (0.09, 0.73)). During the same period, length-for-age z-score increased in the EBF cohort (0.28 (0.03, 0.53)) but not in the CF cohort (-0.22 (-0.50, 0.06)). Changes in anthropometric scores between 3-6 and 6-12 months did not differ between the cohorts. At 12 months, no differences between cohorts were observed for anthropometric scores nor for fat mass or fat free mass.
CONCLUSIONS
In this longitudinal observational study, introduction of CF at 3-4 or 6 months of age had no effects on anthropometric measures in the second half of the first year of life or body composition at 12 months.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_588

EFFECTS OF DAILY AND WEEKLY IRON SUPPLEMENTATION ON IRON STATUS AND ANEMIA IN THAI INFANTS AGED 6 TO 9 MONTHS

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BACKGROUND AND OBJECTIVES
Iron deficiency anemia remains a significant public health issue among young children in Thailand. Before implementing the World Health Organization's recommendation of daily iron supplementation for infants, a study is needed to assess its impact on Thai children. This study aimed to compare the effects of daily and weekly iron supplementation on hemoglobin levels, serum ferritin levels, and anemia prevalence in infants aged 6 to 9 months.
METHODS
A double-blind randomized controlled trial was conducted to compare the effects of daily (12.5 mg/day) and weekly (12.5 mg/week) iron supplementation on 287 healthy, full-term infants aged 6–12 months with hemoglobin >105 g/L. Hemoglobin levels were determined using Fluorescent Flow Cytometry, while serum ferritin, soluble transferrin receptor, C-reactive protein, and α-1-acid glycoprotein levels were assessed using enzyme-linked immunosorbent assay (ELISA). Nutritional status was assessed using the WHO 2006 child growth standards, and dietary intake was analyzed from two 24-hour recalls using INMUCAL-Nutrients. The Mann-Whitney U test was employed to compare hemoglobin levels and iron biomarkers between the two groups, while the Chi-square test was used to evaluate differences in the prevalence of anemia and iron deficiency.
RESULTS
At 6 and 9 months, there were no differences in nutritional status or nutrient intakes between infants receiving daily and weekly iron supplementation. However, at 9 months, those receiving daily supplementation had significantly higher serum ferritin levels (45.5 [P25, P75: 28.5, 67.0] vs. 36.7 [P25, P75: 20.5, 54.9] µg/L). No significant differences were observed in hemoglobin, soluble transferrin receptor, anemia, or iron deficiency between the two groups.
CONCLUSIONS
The findings of this study indicate that initiating daily iron supplementation at 6 months of age for a 3-month duration may improve iron status in infants. However, no differences in anemia or iron deficiency were observed between the two groups at 9 months. Therefore, decisions regarding iron supplementation policies for infants should be deferred until the analysis of 12-month follow-up data is completed.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_589

RELATIONSHIPS BETWEEN UV RADIATION AND SUNSHINE HOURS AS PROXIES FOR VITAMIN D EXPOSURE AT CONCEPTION AND THE PREVALENCE OF OFFSPRING CONGENITAL HEART DISEASE. A TIME-SERIES STUDY IN DENMARK

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BACKGROUND AND OBJECTIVES
Background and objective: Maternal nutrition, including micronutrient status such as vitamin D levels, has been proposed as a potential risk factor for congenital heart disease (CHD). From laboratory and animal studies, vitamin D has been shown to be involved in heart development. However, human data on the role of vitamin D in CHD development are sparse, with mixed findings from small case-control studies. Vitamin D synthesis primarily depends on exposure to radiation from the sun, which fluctuates with seasons in temperate climates. The critical period for heart development occurs early in gestation, yet direct assessment of maternal vitamin D status during this vulnerable stage is logistically challenging. The aim of the study was to investigate the association between ambient UV radiation and sunshine hours around time of conception as proxies for 25(OH)D exposure and the prevalence of CHD.
METHODS
Methods: To address this, we gathered time-series data of the daily count of conceptions, including conceptions with CHD utilizing nationwide register data. Further, we gathered data from the Danish meteorological institute on two meteorological factors, UV radiation (MJ/m2) and sunshine hours as proxies for vitamin D exposure during periods ranging from 2001-2011. We conducted a time-series analysis using distributed lag models (DLM). DLMs allow for the examination of associations and lagged effects of environmental exposures. We analyzed daily conception data, including conceptions resulting in CHD diagnoses, along with meteorological data (UV radiation [MJ/m²] and sunshine hours) in DLMs over 0-14 lags.
RESULTS
RESULTS: We found no evidence of an association between the meteorological data on UV radiation or sunshine hours at the time of conception and offspring CHD diagnoses.
CONCLUSIONS
Conclusion: UV radiation and sunshine hours, as proxies for vitamin D, was not associated with CHD incidence. The study was, however, challenged by low day-to-day variation in the time-series data for CHD.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_592

BODY COMPOSITION OF CHILDREN AGED 6-59 MONTHS ACCORDING TO THEIR NUTRITIONAL STATUS IN NORTHERN SENEGAL

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BACKGROUND AND OBJECTIVES
Malnutrition in children under 5 years of age remains a problem in Senegal despite sustain government partnerships to achieve better outcomes. Body composition Body composition patterns in childhood can have lifelong consequences in terms of overall health. Assessing the distribution of body composition (fat mass and fat-free mass) in relation to the nutritional status of children can play an important role in optimizing the health benefits of nutrition intervention during early life. This study aimed to assess the distribution of body composition according to the health and nutritional status of children under 5 years.
METHODS
A cross-sectional study was carried out in 71 children aged 6-59 months living in northern of Senegal. Weight, height, and upper arm circumference (MUAC) were measured, and anthropometric indicators were used to classify nutritional status of children according to WHO standards. Body composition (fat free mass, fat mass) was estimated using the deuterium dilution technique. Descriptive, correlation, bivariate, ANOVA, and ANCOVA analyses were conducted to compare means according to nutritional status.
RESULTS
Acute malnutrition had no, impact on fat-free mass (P=0.088), but did affect fat mass (P=0.007) in children living in the north of Senegal at this stage. We found that body fat loss was more significant in children under 24 months of age (1.62 kg; P=0.0053). Multiple comparisons of nutritional groups showed that the difference in fat mass from children with good nutritional status and those suffering moderate acute malnutrition (MAM) is 1.27 kg (P=0.011). it is 1.36 kg (P=0.042) in children suffering severe acute malnutrition (SAM). However, no difference was found when comparing children at risk of malnutrition with healthy children, or MAM with SAM.
CONCLUSIONS
Malnutrition affects adiposity but not lean body mass in children children living in the north of Senegal who are at risk of malnutrition. However, the fat mass loss is greater in children with moderate acute malnutrition and in children aged 6 -24 months.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_593

NUTRITIONAL CARE IN GERMAN NURSING HOMES: CHALLENGES AND SUGGESTIONS FOR IMPROVEMENT FROM ONLINE DISCUSSIONS WITH MANAGERS AND EMPLOYEES

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BACKGROUND AND OBJECTIVES
Malnutrition is still a prevalent problem among nursing home residents. To improve this situation, practicable strategies are required for all persons involved in nutritional care.
METHODS
Nursing home managers and employees from all over Germany involved in nutritional care were recruited via newsletters and e-mails for two 2-hour online dialogues to discuss challenges and suggestions for improvement. Four topics were addressed: *cooperation/communication, documentation, resident participation, and sustainability*, based on presented RESULTS of an online survey in advance. Data were analyzed qualitatively with MAXQDA software. Contributions were categorized by topic, challenges and suggestions for improvement.
RESULTS
20 managers and 16 employees with different professional background from 24 institutions participated. Regarding *cooperation/communication* the most frequent challenge addressed was lack of priority for nutrition-related topics. For *documentation*, language barriers as well as lack of time accompanied by high work load, and insufficient interdisciplinary exchange were mentioned. With respect to *resident participation*, the high heterogeneity of residents was highlighted. Increased costs of food products and transport, together with dependency on budget negotiations limit promotion of *sustainability*. To improve the current situation, regarding *cooperation/communication* and *documentation* participants emphasized the need for more (interdisciplinary) training opportunities for staff, for increased staff capacity and budgets, and for standardized operating procedures. To improve *resident participation*, a more flexible and individualized food selection was proposed. For *sustainability* it was suggested to utilize leftovers and to improve waste management. Managers highlighted the need to harmonize and increase budgets for food products and nutritional care.
CONCLUSIONS
The online exchange of directly affected and responsible persons on site revealed a variety of challenges in the area of nutritional care in nursing homes. At an institutional level, the need to pay more attention to nutritional issues, to address them regularly and to create supportive and encouraging structures was highlighted. Beyond that, the importance of political changes in terms of harmonizing and increasing budgets was emphasized.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_594

INTEGRATING NUTRITION INTO RMNCAH QUALITY OF CARE STANDARDS: TANZANIA'S EXPERIENCE WITH THE QOC LALA APPROACH

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BACKGROUND AND OBJECTIVES

Nutrition is a critical determinant of health, particularly within Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCAH) services. However, inadequate integration of nutrition into health systems has limited its impact. To address this gap, Lishe Endelevu and Momentum, in collaboration with Tanzania's Ministry of Health (MoH), implemented the Quality of Care (QoC) LALA framework to integrate nutrition into RMNCAH standards, enhancing service quality and sustainability.

METHODS

The QoC LALA framework, emphasizing Leadership, Action, Learning, and Accountability, was used to drive sustainable health system improvements. Phase one involved reviewing and enhancing the star rating system for health facilities to include nutrition standards within RMNCAH services. This effort, conducted with the Health Quality Assurance Unit, aligned nutrition integration with the broader QoC framework. Nutrition was embedded in the national QI framework and incorporated into QI training and mentoring materials, developed jointly with the MoH. These updates equipped health workers with tools for nutrition-sensitive care while promoting sustainable leadership and accountability mechanisms.

RESULTS

Between November 2021 and March 2022, a star rating assessment of 2,583 primary health facilities identified gaps in RMNCAH and nutrition standards. Only 10.8% met RMNCAH quality standards, 79.6% adhered to maternal audit guidelines, and 37.6% achieved nutrition-related quality standards. Updated QI training improved health workers' capacity for nutrition-sensitive care, enhancing maternal and newborn health outcomes. Supportive supervision data highlighted progress, with nutrition indicators rising from 30.45% in 2023 to 59.97% by December 2024. These findings underscore the impact of integrating nutrition into QI frameworks and strengthening national systems.

CONCLUSIONS

The collaboration between Lishe Endelevu, Momentum, and the MoH showcases the QoC LALA approach's effectiveness in integrating nutrition into RMNCAH standards, fostering sustainable, high-quality healthcare through leadership, action, learning, and accountability.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_597

LEVERAGING CERTIFICATION FRAMEWORKS TO IMPROVE MIYCN SERVICES ACROSS THE LIFECYCLE: THE MIYCN CERTIFICATION MODEL IN JORDAN

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BACKGROUND AND OBJECTIVES
Access to maternal, newborn, and child health services in Jordan is high. Attendance at any ANC (97%) and facility delivery (99%) is almost universal. However, improving quality of health care services including maternal, infant and young child nutrition (MIYCN) services, is still a strategic priority for the Jordanian Ministry of Health. The USAID funded Community Health and Nutrition (CHN) Activity leveraged quality standards based on nationally recognized certification frameworks to design and implement an Optimal MIYCN Model to strengthen MIYCN services across the health system.
METHODS
The Optimal MIYCN Model introduces a standardized quality improvement (QI) certification approach that aligns with global nutrition standards and is contextualized and responsive to the needs of Jordan's healthcare landscape. CHN's design of the Optimal MIYCN Model, including minimum standards, scoring guidelines, and certification criteria, was informed by formative research and market analysis and conducted in collaboration with the Health Care Accreditation Council, a national body authorized to bestow accreditation to qualified health institutions. The Model supports creation of cohorts of public and private health institutions across antenatal, delivery, postnatal and well childcare points of service. The Model also includes a capacity strengthening component, comprising an online infant and young child feeding course and a counselling classroom training for health care personnel. CHN established a distinctive brand associated with attaining the MIYCN standards and seeded a social movement for demand of these quality standards.
RESULTS
To date, 21 health institutions achieved certification as Optimal MIYCN Model institutions and were awarded the distinctive brand. An additional 10 facilities have newly enrolled. The capacity of 759 health professionals was strengthened to provide quality MIYCN services; women clients of health centers (80%) and hospitals (93%) have received improved breastfeeding counseling. Additionally, 21 QI teams are working towards ensuring compliance and sustainability of the standards.
CONCLUSIONS
A systemic holistic process that comprises QI and capacity strengthening with focused community engagement efforts is an effective approach to increasing access to quality MIYCN services. A core component of the process was the development and marketing of a trusted brand that encourages women to prioritize utilizing branded optimal MIYCN services, responsive to their needs.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_598

UTILIZING PROBLEM AND SOLUTION TREES TO IDENTIFY BARRIERS AND REMEDIES TO LOW DIETARY APPROACHES TO STOP HYPERTENSION (DASH) DIET ADHERENCE

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BACKGROUND AND OBJECTIVES
Hypertension is the leading global cause of premature cardiovascular death (1). In the United States (U.S.), low-income African American (LIAA) women present the poorest rates of hypertension control compared to other racial/ethnic groups (2). Dietary Approaches to Stop Hypertension (DASH) is an evidence-based eating plan proven to treat or prevent hypertension. Although DASH has shown a positive effect on reducing cardiovascular disease risk for women and African Americans (3), LIAA women living in subsidized housing encounter numerous structural barriers to acquiring DASH-friendly foods (4). Problem and solution tree (PAST) analysis has been used to examine reasons for suboptimal adoption of nutrition and ecological interventions (5-7). Thus, we utilized PASTs to identify barriers to DASH adherence among LIAA women and strategies to increase DASH adherence.
METHODS
We developed a project advisory board (PAB) of community stakeholders to inform the development of PASTs (8). Over quarterly PAB meetings, we systematically identified immediate, secondary, and tertiary causes of barriers to DASH adherence and constructed solution trees for each distinct cause. We adopted an iterative approach whereby subsequent meetings began with a review of PASTs previously constructed (5,7).
RESULTS
We developed five (5) PASTs that represented immediate barriers to DASH adherence among LIAA women. From a literature review we initially identified three primary causes to low adherence: cost, supply, and preference (4, 9-10). Input from the PAB revealed time and education as added barriers to adherence. The PAB identified second- and third-level causes for each root cause. For example, secondary cost-related barriers included federal reductions in COVID-19 emergency food assistance and the low cost of high-sodium foods in the U.S. Shelf stability of high sodium foods, a tertiary cost-related barrier, in turn serves as an attractive food purchase option for LIAA women. Solutions ranged from local-level adjustments like nutrition education for children and families to policy-level remedies like produce subsidies. PASTs also showed that certain singular solutions, like an increase of the minimum wage, could potentially remedy multiple barriers.
CONCLUSIONS
LIAA women have the highest hypertension prevalence among women of all other racial/ethnic groups in the U.S. (2). PASTs expanded the known barriers to adherence of DASH and revealed opportunities to customize DASH interventions that address these barriers for the health disparity group.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_599

LONGITUDINAL STUDY OF NUTRITION AND ENERGY HEALTH STATUS IN PREGNANT WOMEN: PROTOCOL FOR A PROSPECTIVE COHORT STUDY (PANCAKE STUDY)

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BACKGROUND AND OBJECTIVES
Maternal diet during pregnancy significantly affects both maternal and offspring health outcomes. However, few studies have prospectively assessed weight gain, energy requirements, and additional nutrient needs using both the doubly labeled water (DLW) method and dietary records. The PANCAKE (Pregnancy And Nutrition Cohort At KEnto) Study is a prospective investigation designed to measure dietary intake, weight gain, and total energy expenditure, and to integrate pregnancy and infant health data from local health check-ups, thereby validating additional energy and nutrient requirements during pregnancy.
METHODS
In this prospective cohort study, we will recruit 1400 pregnant women who submit a pregnancy notification in Settsu City, Japan. Participants will provide information on pregnancy and infant health check-ups collected in Settsu City. Of these pregnant women, 600 women will be followed up using questionnaires (validated questionnaires on sleep and depression, physical activity questionnaires, and food frequency questionnaires) throughout all three trimesters of pregnancy and the postpartum period. In addition, 400 of these pregnant women will be asked to implement a three-day dietary record and an activity meter to measure their physical activity during the middle and late stages of pregnancy. In addition, body composition and skin carotenoid measurements will be taken for 200 of these women. And for 30 of these women, the DLW method, which can most accurately measure total energy expenditure, will be implemented.
RESULTS
The analysis, which is designed to gain a multifaceted understanding of the factors that affect maternal and child health, will analyze how dietary intake is related to maternal health indicators, such as weight gain during pregnancy and metabolic and physiological adaptations during pregnancy. In addition, this study will analyze how maternal energy intake and expenditure, according to maternal body size, affect fetal growth and the health of the newborn, and will evaluate the additional energy and nutrient intake required during three trimesters of pregnancy for the proper development of the fetus.
CONCLUSIONS
The PANCAKE Study's RESULTS may provide a basis for establishing reference values for pregnant women's dietary intakes, guide healthy weight gain recommendations, and inform revisions to dietary guidelines. Ultimately, this evidence-based approach can support women before and during pregnancy and contribute to improved nutritional policies.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_600

Effect of fish consumption on the interactions between the gut microbiota and inflammatory markers: RESULTS from the iFISH study

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BACKGROUND AND OBJECTIVES
Dietary intake can influence immune function indirectly by affecting the gut microbiota composition and metabolism (1). Fish consumption has been shown to positively regulate the gut microbiota in humans (2, 3); albeit in those studies fish was consumed in high amounts (500-750g/week) and immune function was not investigated. This study investigated the effect of consuming the UK dietary recommendation for fish (4) (2 portions [140-280g/week], one of which is oily) on the gut microbiota alpha diversity. Further, we examined if changes (pre- to post-intervention) in the gut microbiota composition were associated with changes in immune cytokine concentrations.
METHODS
An 8-week randomised controlled trial in low fish consuming women of childbearing age (n=41; median age 23y) investigated the effect of consuming 1 or 2 portions of fish (tuna or sardines)/week compared to not consuming fish. A blood sample was collected to measure inflammatory cytokines (tumour necrosis factor-a, interleukin [IL]-1b, IL-5, IL-6, IL-17A and IL-22) pre- and post-intervention. Faecal samples were collected at both timepoints and extracted DNA was used to determine gut microbiota compositional profiles using 16S metagenomic sequencing (Illumina, USA). Statistical analysis investigated significant differences in changes in gut microbiota alpha diversity and compositional relative abundances between fish intervention (N=26) and control (N=15), then stratified by portion size (1 vs 2 portions) and type of fish (tuna vs sardines).
RESULTS
Fish consumption did not significantly affect gut microbiota alpha diversity indices (Chao1, Simpson, Shannon, phylogenetic diversity, observed species). Consumption of sardines significantly reduced Bacteroidetes (-4.77 ± 4.88%) when compared to control (+4.15 ± 7.58%). No significant differences were observed in genus-level relative abundances nor inflammatory cytokine changes. In the fish intervention group, increases in IL-17A, IL-22 and IL-6 concentrations were positively correlated with changes in *Alistipes*, *Rhodococcus*, *Haemophilus*, *Barnesiella* and *Akkermansia* relative abundances.
CONCLUSIONS
In this cohort, the UK recommendations for fish consumption has no significant impact on the gut microbiota diversity. Sardines, rich in n-3 polyunsaturated fatty acids, may have health benefits in disease states where Bacteroidetes is elevated; nevertheless, further research is required in a larger cohort over a longer period.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_602

CAN ANIMAL-SOURCED OR NUTRITIOUS PLANT-BASED FOODS REDUCE CHILD MALNUTRITION IN INDIA?

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BACKGROUND AND OBJECTIVES
Child undernutrition remains a critical public health concern across the Global South, especially in India, due to the substantial proportion of the world's stunted and wasted children. Malnutrition reflects linear growth retardation caused by persistent nutrient deficiencies, infections, and inadequate dietary diversity. In accordance with the significance of food intake on nutrition, this study aims to (1) evaluate the overall impact of Animal-Sourced Foods (ASF) and Nutritious Plant-Based Foods (NPBF) consumption on the child malnutrition index (2) identify the contributions of specific food items to child nutritional outcomes, and (3) explore the variations in these associations across different age cohorts of children.
METHODS
The study used the National Family Health Survey (NFHS) 5 (2019–21); for children aged 0–59 months. A malnutrition index was constructed using Principal Component Analysis (PCA), with three key indicators: stunting, wasting, and underweight. Food consumption variables were categorized into two groups: Animal-Sourced Foods (ASF), which include meat, fish, eggs, and dairy; and Nutritious Plant-Based Foods (NPBF), comprising legumes, vegetables, and fruits. The Ordinary Least Squares (OLS) method was employed to analyze the association between food consumption patterns and the malnutrition index.
RESULTS
The findings reveal that both ASF and NPBF consumption are significantly associated ($p<0.01$) with lowering the child malnutrition index by 2.7 per cent and 2.9 per cent, respectively, with NPBF having slightly more impact. Among ASFs, dairy consumption (2.4 per cent) showed the strongest association with reducing malnutrition, while eggs also had a negative but smaller effect. NPBFs such as legumes and fruits also demonstrated significant benefits. The RESULTS further underscore age-specific impacts, with dairy consumption showing adverse effects for infants under six months, likely due to improper breast milk substitution. In older children, legumes, fruits, and vegetables played a critical role in reducing malnutrition, while the effects of ASF varied across age groups. Furthermore, the study explains that maternal education and household wealth emerged as consistent factors in reducing the likelihood of malnutrition.
CONCLUSIONS
The findings highlight the need for comprehensive, age-specific nutrition interventions that address dietary diversity, cultural preferences, and socioeconomic disparities in India.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_603

FACTORS ASSOCIATED WITH DIETARY DIVERSITY AMONG GHANAIAN INFANTS AND YOUNG CHILDREN (6-24 MONTHS): A CAREGIVER-REPORTED ANALYSIS

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BACKGROUND AND OBJECTIVES

Inadequate feeding practices in infants and young children can result in stunted growth, impaired cognitive development, heightened susceptibility to infections, and increased mortality rates [1]. The WHO recommends introducing complementary foods to infants at 6 months to meet their nutritional needs [2]. We examined the impact of caregivers' socio-economic status, dietary knowledge, attitudes, and practices on dietary diversity (DD) among infants and young children aged 6-24 months in four districts of Ghana.

METHODS

A total of 969 caregivers were selected using a multistage sampling method. Through face-to-face interviews, their knowledge and attitudes regarding DD, household income, child age, and feeding practices were evaluated. Ethical clearance was obtained, and informed consent was obtained from all participants before data collection. Statistical analysis was conducted using Stata version 17.0 with a significance level set at p-value of 0.05 or 5%. Descriptive analysis was performed for socio-demographic variables, while the relationship between independent variables and dietary diversity was assessed using the Chi-square test. Logistic regression analysis was utilized to identify predictors of DD.

RESULTS

Caregivers' dietary knowledge (AOR=14.90, 95% CI: 6.95-31.91), positive attitude towards DD (AOR=7.46, 95% CI: 4.31-12.92), child age (AOR=2.35, 95% CI: 1.51-3.66; p=<0.001), AOR=2.28, 95% CI: 1.49-3.51; p=<0.001), and monthly income (AOR=0.51, 95% CI: 0.31-0.86) were significantly associated with infants' and young children's DD. Additionally, married caregivers were 1.89 times more likely to provide diversified feeding for their children (AOR=1.89, 95% CI: 1.24-2.89; p=<0.003).

CONCLUSIONS

The findings emphasizes the importance of enhancing caregiver education and addressing financial constraints to improve childhood nutrition outcomes significantly. Targeted interventions focusing on these factors can play a pivotal role in promoting optimal growth, health, and development in young children. Further research and tailored interventions are essential to address existing disparities and enhance the overall well-being of children in this age group effectively

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_604

MATERNAL DEPRESSION AND DIETARY PRACTICES DURING THE FIRST 1000 DAYS IN SOUTHERN ANGOLA

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BACKGROUND AND OBJECTIVES
There is evidence suggesting that maternal depression may impair breastfeeding practices and childcare, which can negatively impact the child's nutritional status. However, findings are contradictory, with some studies failing to establish a significant association. This study aims to evaluate the impact of maternal depression on feeding practices of infants under 6 months of age in Southern Angola.
METHODS
The data analyzed comes from the MuCCUA trial, a community-based cluster-randomized controlled trial evaluating the cost-effectiveness of interventions to prevent chronic malnutrition during the first 1000 days. Pregnant women were recruited and are being followed every 3 months until their children reach 2 years of age. At the 3-month postpartum interview, child feeding practices were collected according to WHO and UNICEF guidelines, while maternal diet was assessed using the Minimum Dietary Diversity for Women (MDD-W) indicator. Maternal depression was measured with the Patient Health Questionnaire-8 (PHQ-8). Descriptive analysis and Chi-square tests were used to assess variable associations.
RESULTS
Among 1048 women interviewed, around 15% presented symptoms of depression according to the PHQ-8 indicator. Nearly all women (99%) reported breastfeeding their child at least once, 90% initiated breastfeeding early within the first hour after birth and 98% breastfed their children during the first day of life. Additionally, 68% of the children were exclusively breastfed. Only 8.4% of the women met the MDD-W. Overall, 0.7% of children had never been breastfed. This percentage increased to 1.7% among children of mothers with depression and decreased to 0.5% among those whose mothers did not have depression. Although no association was found between depression and breastfeeding initiation after the first hour postpartum (delayed initiation of breastfeeding), an association was observed with breastfeeding initiation after 24 hours of delivery (late initiation of breastfeeding), which was more frequent among mothers with symptoms of depression. No significant associations were found between maternal depression and MDD-W, nor with exclusive breastfeeding.
CONCLUSIONS
Depression appears to negatively impact breastfeeding practices, as mothers who experience depression are more likely to delay the initiation of breastfeeding after delivery. Furthermore, although not reaching statistical significance, a negative trend in breastfeeding practices was observed among mothers with depression.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_605

SWEET TALK: APPLYING AND EXTENDING THE THEORY OF PLANNED BEHAVIOR IN EXPLORING THE PERCEPTIONS OF THE PROPOSED SUGAR TAX AMONG INDONESIAN CONSUMERS

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BACKGROUND AND OBJECTIVES
Being the country with the third highest consumption of sugar-sweetened beverages (SSBs) in Southeast Asia, Indonesia's growing obsession with such beverages is easily seen in numbers, amounting to 20.23 liter/person. Commonly consumed by young children and adults, sugar consumption has emerged as a scourge of non-communicable diseases (NCDs), accounting for 73% of deaths and the highest insurance spending for diabetes in 2018. The government is proposing an SSB tax to be implemented in 2025 to reduce sugar consumption. This study aims to gain insight into the factors that shape key consumers' perceptions of the proposed sugar tax by investigating the awareness, belief, and attitudes.
METHODS
Research was based on the Theory of Planned Behavior modified to include the framework on acceptance of intervention strategies in the food domain and the motivation-opportunity-ability model. 14 participants were recruited with purposive sampling and divided into two groups: adults and parents (mothers) of children ages 3-11 years old, who purchase at least one SSB per week. Semi-structured interviews were conducted online and answers were coded inductively and deductively using Atlas.ti to create a thematic map.
RESULTS
(1) *Awareness*: Only 14% of the respondents were aware of the sugar tax, however, all were aware of health-related problems. More than half correlated it with the ongoing cigarette tax, that smokers are willing to pay higher prices, which could be the case with SSB consumers. (2) *Belief*: Adults show a more divided perception of fairness and effectiveness. 50% of parents perceived the tax to be fair and effective, considering it a good tool to teach children to drink more water and discourage SSB consumption, mostly packaged flavored milk. The discrepancy between low and high-income populations was linked to fairness, emphasizing the difference in purchasing power and level of education. The cultural and habitual context play a role and tax alone would not drive behavioral change. Restriction on sugar amount, reduced packaging size, and reformulation were stated to be more effective. (3) *Attitude*: 64% of respondents showed support depending on the tax rate and utilization of tax revenue (improving health insurance, welfare, and for the subsidy of staple foods.)
CONCLUSIONS
There was a low awareness of the SSB tax and divided beliefs and attitudes largely influenced by the perception of fairness and effectiveness. The perceived opportunity and ability to make choices when confronted with tax was highly related to financial status.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_607

MATERNAL APPROACH TO FEEDING 6-23 MONTH OLD CHILDREN LIVING IN PERI-URBAN AREAS. A QUALITATIVE STUDY

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BACKGROUND AND OBJECTIVES
Infant and young child feeding is critical to improve child survival, promote healthy growth and development. It is during the period between 6 and 23 months of age that children's nutritional status is most vulnerable and affected by access to food. For this reason, the mother's participation is extremely valuable, as her feeding practices are influenced by her social environment: beliefs; gender stereotypes and body image; parenting style; family structure; stress; eating habits, nutritional knowledge and food preparation skills. The aim of this study was to understand maternal approaches to feeding in children aged 6–23 months living in peri-urban areas of a LMIC.
METHODS
Qualitative, phenomenological study. Twenty mother-child dyads participated. Twenty semi-structured interviews and 12 observations were conducted, Braun's thematic analysis was used to construct 6 themes related to child feeding from the mothers' perspective. The information was processed using NVIVO 12 software
RESULTS
Mothers with an average age of 28 years and their children were 13,8 months old. The way they made decisions about infant feeding was understood in terms of their feeding practices and maternal sensitivity. For the former, maternal perceptions of as to what and how much to offer were influential; for the latter, responsiveness as to when and how to offer for limited responsive feeding in those older than 12 months.
CONCLUSIONS
Mothers' approach to infant feeding was influenced by personal and family environmental factors that conditioned their feeding practices and quality of care.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_608

PUBLIC POLICIES IN FOOD SYSTEMS TO SUPPORT NUTRITION

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BACKGROUND AND OBJECTIVES
From the State of Food Security and Nutrition in the World (SOFI) 2023, it is reported that undernourishment and hunger have not been eradicated and on the other hand, malnutrition in excess manifestations continue to increase, highlighting new challenges to achieve the SDG 2030, resulting from the fragility of global food systems.
Objective: Identify policies and measures in nutrition-sensitive food systems that can improve the nutrition status of Central American populations.
METHODS
The study was conducted during the year 2021-2022 looking for policies and measures in nutrition-sensitive food systems recommended by FAO in its report *"New Food Patterns, More Challenges for Food Systems. 2030 - Food, agriculture and rural development in Latin America and the Caribbean".*
Based on an exploratory search, official websites of legislative congresses, ministries or government agencies were reviewed to identify ordinances, laws, policies, programs and interventions that countries had planned and/or implemented in their countries. In addition, focus groups and interviews were conducted with key national stakeholders to understand and/or complete the information found in each of the countries.
RESULTS
States have made progress in achieving nutrition-sensitive policies and measures that favor the maintenance of the food system, especially to improve the problems of weight and micronutrient deficits, however, there are still challenges to implement interventions to reduce excess weight.
Implemented: Family farming incentives, Free fairs and short circuits, Food fortification, School Feeding Programs, Financial support for small and medium-sized enterprises, Food supply and price monitoring, Social protection systems.
To be implemented: Taxes on foods high in critical nutrients, Healthy food subsidy, Regulation of advertising, Front food labeling, Regulatory initiatives to reduce salt, sugar and fat in the food industry.

CONCLUSIONS
Public policies in food systems have a fundamental role in nutrition. The integration and application of each one of them has a fundamental impact on the nutritional and health status, so it is necessary to monitor and apply them according to the nutritional transition of the population.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_609

HAND GRIP STRENGTH AND ITS RELATIONSHIP WITH ULTRA-PROCESSED FOOD CONSUMPTION FROM THE MALAYSIAN HEALTH AND ADOLESCENTS LONGITUDINAL RESEARCH TEAM STUDY (THE MYHEART)

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BACKGROUND AND OBJECTIVES
Adolescents obtain and maintain the appropriate lean body weight for better musculoskeletal health and other long-term health benefits is crucial. Studies on the association between hand grip strength (HGS) and ultra-processed food (UPF) consumption among adults were well documented, however, adolescents is not well understood. The objective of this study is to examine the association between HGS and UPF consumption.
METHODS
A cross-sectional analysis included 974 secondary school children from MyHeART cohort in 2016. A calibrated JAMAR handgrip dynamometer used to measure HGS. A seven-day diet history assessed UPF calorie intake, analyzed using the Nutrient Composition of Malaysian Food (4th edition) database. Generalized linear model was performed separately by gender, to examine the association between HGS and UPF consumption.
RESULTS
HGS was not associated with UPF energy intake in either gender. It appears male adolescents from rural schools demonstrated significantly higher HGS compared to their urban counterparts ($p<0.001$). Among females, Indian participants had significantly lower HGS than Malays ($p=0.007$). Additionally, each unit increase in waist circumference was associated with a 0.194 unit reduction in HGS ($p<0.05$), and rural school adolescents showed higher MS than those in urban schools ($p<0.001$).
CONCLUSIONS
While no association was found between UPF energy intake and HGS, prioritizing nutrition strategies to support adolescent musculoskeletal health remains essential.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_610

DETERMINANTS OF DIET QUALITY IN PRECONCEPTION

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BACKGROUND AND OBJECTIVES

The preconception stage is of great importance for optimizing health and nutritional status. Despite its impact and priority, diet quality during preconception often remains underexplored, specifically in relation to education, income, living environment, and access to nutritional counseling.

METHODS

We conducted a study to analyze the association between various socio-economic and demographic factors with the Diet Quality Index (DQI) in a sample of 251 women. Data were collected using an anonymous web-based questionnaire that included sections on socio-demographic characteristics, nutritional knowledge, determinants of food choices and the International Federation of Gynecology and Obstetrics (FIGO) diet quality score (FIGO-DQS).

RESULTS

The frequencies showed that 74.9% of the participants obtained a high DQI score, with significant differences observed between different variables. The primary predictors considered were: level of education, income, living environment, nutritional counseling and parity status. Statistical tests revealed key findings: level of education significantly influenced diet quality (χ^2=10.6, p=0.001, OR=0.372, CI=0.203–0.683), as did living environment (χ^2=10.9, p<0.001, OR=2.63, CI =1.47–4.72). Multiparity was also a significant factor (χ^2=6.43, p=0.011, OR=3.34, CI=1.26–8.85). In contrast, nutritional counseling was not statistically significant in the impact of diet quality (χ^2=1.24, p=0.265). Logistic regression analysis confirmed these trends, highlighting the critical role of education (OR=2.04, CI=1.035–4.02) and living environment (OR=1.98, CI=1.056–3.71) in predicting superior diet quality. Multiparity had an odds ratio of 2.42, with no significance (p=0.084).

CONCLUSIONS

Our RESULTS highlighted certain determinants of diet quality, emphasizing the need for tailored interventions, particularly addressing educational and demographic differences.

CONFLICTS OF INTERESTS

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EPO5_611

DIFFERENCES IN RISK OF ORTHOREXIA NERVOSA AND DIET QUALITY BY DIFFERENT TYPES OF PHYSICAL ACTIVITY - A COMPARATIVE STUDY IN A GROUP OF POLISH AMATEUR TRAINING INDIVIDUALS

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BACKGROUND AND OBJECTIVES
Orthorexia Nervosa (ON) is described as an obsession with healthy eating, characterised by a restrictive diet and avoidance of foods considered unhealthy, leading to nutritional deficiencies or medical complications. Although there are links between physical activity (PA) and the occurrence of orthorexia, research findings are still inconclusive and data on the association of orthorexia with different activities are still scarce. The aim of the study was to assess the risk of ON according to the different types of physical activity practiced, the time spent on physical activity and the connection with diet quality.
METHODS
The study, using the CAWI method, was conducted in September-October 2024. Participants were recruited using social media channels on the topic of healthy eating and/or physical activity. A total of 3981 exercising individuals and control, non-training group of 2763 participated in the study. The study group consisted mainly of women (92.4%). Participants were asked metric questions, questions about physical activity, frequency and duration of training, and the nature of exercise. Risk of ON was used with the Düsseldorf Orthorexia Scale (DOS). The KomPAN questionnaire was used to measure dietary quality (DQI).
RESULTS
The mean age of the study participants was 32±6 years, mean body mass 70.8±16.3 kg, mean body height 167.7±7.1 cm. Based on the declared nature of exercise, participants were divided into strength (ST; n=1011), endurance (ET; n=960) and endurance-strength (EST; n= 1985) training groups. The number of points on the DQI scale was correlated with the number of points on the DOS scale. Training participants scored significantly more points on the DOS ($p<0.001$, U-Mann-Whitney's test) and DQI ($p<0.001$, U-Mann-Whitney's test) compared to non-trainers. There were no differences between the ST and EST groups on the DOS and DQI scales ($p>0.05$), but both groups scored higher than the ET group ($p<0.002$). However, all 3 groups scored significantly higher than the non-training group ($p<0.001$). There was an association between weekly training time and the scores obtained on the DOS ($p<0.001$) and DQI scales ($p<0.001$).
CONCLUSIONS
The higher risk to have orthorexia were associated not only with the better quality of the diet, but also with the time spent on physical activity and its nature. Further research on the association between physical activity and orthorexia nervosa is needed to verify the effect of physical activity on the occurrence of individual symptoms of ON.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_612

PHYSICAL ACTIVITY, SLEEP QUALITY, STRESS LEVELS, AND EATING HABITS OF NURSING STUDENTS IN PANAMA

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BACKGROUND AND OBJECTIVES
University students often face lifestyle changes that impact their health, including alterations in eating habits, sleep quality, and stress levels. In Panama, obesity and sedentary behavior are significant public health concerns, increasing the risk of non-communicable diseases. Students in the health field are expected to serve as role models for the population. Therefore, the objective of this study was to evaluate the levels of physical activity, sleep quality, stress, and eating habits among nursing students in Panama.
METHODS
This is a cross-sectional and analytical study including a sample of 171 nursing students from universities in Panama. Data collection was conducted from June to October 2024 through questionnaires assessing sociodemographic variables, body image perception, frequency of food consumption, physical activity using the Global Physical Activity Questionnaire (GPAQ), perceived stress using the Perceived Stress Scale (PSS), and sleep quality using the Pittsburgh Sleep Quality Index. Self-reported weight and height were used to evaluate nutritional status.
RESULTS
The sample consisted of 73.1% women, with an average age of 21.3 years. Among the participants, 66.7% were in their second year of study, and the majority (56.7%) resided in Panama's interior regions. Regarding body image perception, 46.2% perceived themselves as having normal weight, 37.4% as overweight, and 16.4% as underweight. A low level of physical activity was reported by 67.8% of participants, while only 3.51% reported high levels of activity. In terms of stress, 57.9% reported low stress levels, and 38.6% reported moderate stress. Low consumption of fruits (52%), vegetables (44%), and snacks (54%) was identified. Sleep quality was poor, with 67.3% requiring medical treatment, 22.8% requiring medical attention. According to anthropometric evaluations, 51.5% had a normal nutritional status, while 33.9% were overweight, and 9.4% were classified as obese.
CONCLUSIONS
The findings reveal a high prevalence of overweight and obesity, low physical activity levels, moderate stress, poor sleep quality, and suboptimal dietary habits. These RESULTS highlight the need for interventions targeting lifestyle changes and health promotion in this population to align their behaviors with their role as future health professionals.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_613

NUTRITION, PHYSICAL ACTIVITY, AND DIETARY HABITS AMONG CHILDREN AGED 6–12 IN SPORTS AND NON-SPORTS CENTERS IN PANAMA

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BACKGROUND AND OBJECTIVES
The prevalence of overweight and obesity in Panama has increased in recent years, associated with inadequate dietary habits and a lack of physical activity. These issues compromise children's proper development and elevate the risk of non-communicable diseases. This study aimed to determine the nutritional status, physical activity levels, and dietary habits of children aged 6 to 12 years attending sports and non-sports centers.
METHODS
This is a descriptive and cross-sectional study conducted with a sample of 113 school-aged children (6–12 years) from the Panama Oeste province. A sociodemographic survey was completed by parents, while children answered a food frequency questionnaire. Physical activity levels were assessed using the Physical Activity Questionnaire for Older Children (PAQ-C).
RESULTS
Of the total participants, 46% were classified as overweight or obese, with higher prevalence in non-sports centers (46.9%) vs sport center (44.9%). Children attending sports centers exhibited higher physical activity levels, with 38.8% classified as active or very active, compared to 51.6% of children in non-sports centers who were classified as sedentary. Additionally, 89.4% of children exceeded the recommended intake of free sugars, 36.3% exceeded fat intake, and 5.4% exceeded sodium intake.
CONCLUSIONS
The study highlights a significant prevalence of overweight and obesity among children, with higher rates in non-sports centers. Children attending sports centers demonstrated better weight distribution and abdominal circumference, yet neither group achieved the WHO recommendation of 60 minutes of daily physical activity. Additionally, excessive intake of free sugars, fats, and sodium was observed, indicating a need for interventions promoting structured physical activity and improved dietary habits to address overweight and reduce sedentary behavior.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_614

RELATIONSHIP BETWEEN PRENATAL CARE, INADEQUACY OF GLYCEMIC CONTROL AND GESTATIONAL WEIGHT GAIN IN WOMEN WITH HYPERGLYCAEMIA IN PREGNANCY

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BACKGROUND AND OBJECTIVES
Hyperglycaemia in pregnancy [HIP] is the most common metabolic dysfunction during this period [1]. Prenatal care [PC] is essential in protecting the health of pregnant women and their newborns [2]. In addition, studies point to the importance of specialized prenatal nutritional therapy in the prevention and control of complications commonly associated with HIP [3,4,5], such as inadequate glycemic control (the main factor impacting obstetric and perinatal outcomes), inadequate gestational weight gain [GWG], hypertensive disorders of pregnancy [6,7], and the delivery of macrosomic or large-for-gestational-age newborns [8]. Therefore, the aim of the study was to analyze the relationship between PC and inadequacy of glycemic control and GWG in women with gestational diabetes mellitus [GDM] and pre-gestational diabetes mellitus [PDM]
METHODS
A longitudinal study in which glycemic control was considered inadequate when fasting glycemia ≥95mg/dL or 1-hour postprandial glycemia ≥140mg/dL. Adequacy of GWG was classified according to the Institute of Medicine. The confounding factors were identified using the direct acyclic graph [9]: pre-pregnancy body mass index, education, occupation, maternal age and number of PC consultations. Multiple logistic regression was applied and adjusted odds ratios [ORa] were estimated with 95% confidence intervals [CI].
RESULTS
A total of 773 women were analyzed (GDM = 606; PDM = 164). The variables related to inadequacy glycemic control were: GDM maternal age ≥31 years in the second trimester (ORa = 1.68; CI:1.15–2.44); <8 PC consultations (ORa = 1.71; CI:1.04–2.81) and <4 consultations with a nutritionist in the third trimester (ORa = 2.20; CI:1.49–3.22); PDM: pre-pregnancy overweight/obesity (ORa = 2.10; CI:1.02–10.33) and <8 PC consultations in the second trimester (ORa = 9.29; CI: 1.02–84.29). Inadequacy GWG was related to pre-pregnancy overweight/obesity in patients with GDM (ORa = 2.59; CI = 1.70–3.94) and PDM (ORa = 2.54; CI: 1.16–5.59).
CONCLUSIONS
The factors indicated as predictors of the outcomes analyzed are potentially modifiable and point to the importance of intervention **s**pecialized PC, including nutritional therapy wich, when started early, can favor the adequacy of glycemic control and GWG in women with HIP.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_615

EVALUATING THE HEALTHINESS OF INDUSTRIALLY-PROCESSED BEVERAGES FOR CHILDREN IN CAPE COAST: INSIGHTS USING THE WHO NUTRIENT PROFILING CRITERIA

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BACKGROUND AND OBJECTIVES
Beverages are commonly consumed by children. Industrially processed beverages marketed to children are often high in sugars, fats, etc contributing to childhood obesity and non-communicable diseases (NCDs). The World Health Organization's Nutrient Profiling Model (WHO-NPM) for the African Region provides a framework to assess the nutritional quality of foods and beverages for children. This study evaluated industrially processed beverages sold in major supermarkets in Cape Coast, Ghana, using the WHO-NPM to determine their healthiness for children.
METHODS
A cross-sectional study analyzed 60 labeled beverages across five subcategories. Following a two-stage sampling procedure, the study estimated and sampled 3 major supermarkets in Cape Coast which the population frequents for food. Data collected included: the name of food product, food category by WHONPM, composition of total fat, sugar, sodium, and saturated fats per 100g of each product identified. Descriptive analyses were undertaken to describe the number of products from each food group and the proportion of products categorized as 'unhealthy' and 'healthy' by the WHONPM.
RESULTS
Out of 60 beverages,66.67% were classified as unhealthy, 10% as healthy, and 23.33% as inconclusive due to missing or unclear information. The highest proportions of unhealthy beverages were water-based drinks (83.3%) with average total sugars of 34.4g per 100g and Standard Deviation (SD) of 31.50, which is above the recommended threshold for total sugars of 0.0g. Milk-based drinks were 64.3% unhealthy with an average total fat of 11.2g per 100g (SD of 9.95), which is above the recommended threshold of 4.0g per 100g for total fat in this category. Juices were 66.7% unhealthy with average total sugars of 9.2g per 100g (SD of 3.96), which is above the recommended threshold for total sugars of 6.0g. All coffee substitutes and teas were classified as unhealthy, while 43% of cereal-based beverages were inconclusive, with average total sugars of 5.2g per 100g (SD of 4.78), which is below the recommended threshold for total sugars of 6.0g.

CONCLUSIONS
A significant proportion of industrially processed beverages in Cape Coast are unhealthy for children. Stricter regulations on beverage labeling and marketing, as well as public education, are recommended to promote healthier beverage choices for children.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_616

VITAMIN E STATUS IN ADULTS AND ELDERLY IN THE CONTEXT OF THE POST-COVID-19 PANDEMIC: A CASE STUDY

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BACKGROUND AND OBJECTIVES
he COVID-19 pandemic exacerbated the food and nutritional situation of various populations, including an increase in the consumption of high-calorie, low-nutrient-dense foods, which may have contributed to the rise in malnutrition and potential micronutrient deficiencies. In this context, evidence shows a variation in the global prevalence of Vitamin E deficiency (VED) ranging from 0.6% to 55.5% in populations at risk for non-communicable chronic diseases (NCDs), resulting in the worsening of mechanisms promoting cardiovascular diseases (CVD). Therefore, this study aimed to assess Vitamin E (alpha-tocopherol) status in adults and elderly individuals with risk factors for NCDs in the post-COVID-19 context.
METHODS
This was a cross-sectional study of a sub-sample from a cohort of adults and elderly individuals monitored before and after the COVID-19 pandemic. Vitamin E status was determined by serum alpha-tocopherol levels, measured using Ultra High Performance Liquid Chromatography with a Photodiode Array. Alpha-tocopherol values ≤ 12 µmol/L indicated VED, and < 30 µmol/L reflected inadequate serum levels.
RESULTS
Overall, 63.2% of participants were of Black/Brown ethnicity, 45.6% had low educational levels, 17.6% were smokers, and 80.9% were overweight. The average alpha-tocopherol concentration was 12.1 (9.2) µmol/L, with no significant difference according to life stage. The majority of participants had VED (58.8%), and 97.1% did not have alpha-tocopherol levels indicative of cardiovascular protection.
CONCLUSIONS
The evaluated population is vulnerable to NCDs due to the high prevalence of VED and inadequate Vitamin E levels, suggesting low cardiovascular protection in these cases.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_617

NUTRITIONAL STATUS OF CHILDREN LIVING IN URBAN AREAS OF CHIANG MAI, THAILAND: AN APPLICATION OF GLOBAL DIETARY RECOMMENDATIONS (GDR) SCORES

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BACKGROUND AND OBJECTIVES
Nutrition in childhood is a critical determinant of health, with both short-term development and long-term well-being affected. In urban areas of Thailand, such as Chiang Mai, children suffer from a double burden of malnutrition, where overnutrition and undernutrition coexist. Those lives in urban areas are likely to be at risk of malnutrition due to the easy availability of processed, energy-dense foods, limited access to diverse, nutritious meals, and socioeconomic factors that influence food security and dietary habits. While dietary habits are an increasing concern, comprehensive data on the nutritional status of children specifically in urban settings are lacking.
METHODS
This study fills the gap by assessing the dietary patterns of 279 children aged 9–12 years in Chiang Mai using GDR Scores for the first time, providing a new perspective on adherence to global dietary guidelines and its consequences on health. The Dietary Dieversity Score (DDS) was used to explore the variety of food groups consumed. Anthropometric status was also measured.
RESULTS
Overall GDR scores for children stood at 7.8 out of a total of 18 points and indicate moderate adherence to the global dietary guidelines. The NCD-Risk score was 4.6 out of 9, suggesting a high consumption of risk-enhancing foods, such as sugary snacks, fast food, and processed meats. In contrast, the NCD-Protect score of 3.4 out of 9 reflected a moderate intake of protective foods, including fruits, vegetables, and whole grains. Besides GDR scores, the DDS, which provides a glimpse of an ability to access food and is closely related to food and nutrition security, was found to be 6.35 out of 10. This score indicates a situation of moderate food security with a reasonably varied diet. However, the analysis also brought some important nutrition-related challenges: 95% of the children had normal height-for-age Z-scores, while 5% were stunted or severely stunted. Moreover, 18.3% of the children were overweight or obese, which reflects the increasing concern of overnutrition in urban areas.
CONCLUSIONS
The study points out that targeted interventions should be made to enhance healthier eating behaviors, improve access to more nutritious foods, and decrease the consumption of foods laden with risks. Public health policies can contribute to the reduction of the growing prevalence of NCDs and improve the health outcomes of future generations by aligning local dietary practices with global recommendations.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_619

SOCIAL NETWORK AND INFLUENCE MAPPING OF STAKEHOLDERS INVOLVED IN ANAEMIA CONTROL PROGRAMMING AMONG WOMEN OF REPRODUCTIVE AGE IN GHANA

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BACKGROUND AND OBJECTIVES
In Ghana, anaemia among women of reproductive age (WRA) is high (41%), a decline from 59%. Sub-nationally, significant reductions were observed in the Upper West (UWR) and Eastern region (ER). This study mapped key stakeholders involved in anaemia programming, their roles, actions, connections and influence on anaemia decline among WRA in the two regions between 2009 and 2020.
METHODS
Seventeen stakeholders from the ER and 14 from the UWR participated in Network Mapping interviews in 2021, using IFPRI's Net-Map approach. Study participants were selected based on current or previous roles in anaemia programming in the two regions. Interview audio recordings were transcribed verbatim to verify the interview data. Analysis was conducted using VisuaLyzer, a visualised social networking mapping tool and Excel.
RESULTS
Thirty-nine stakeholders involved in WRA anaemia programming were identified in the ER. Stakeholders were connected by 275 links related to formal authority, funding, and information supply (advocacy, technical assistance, dissemination and informal) across actors. Ten stakeholders from government (National-levelled Ghana Health Service, Department of Agriculture), civil society organizations, and community-level beneficiaries were central within the network. The remaining were periphery stakeholders linked to the ten actors in the network. Thirty-five stakeholders were identified in the UWR and connected by 182 links. Eight actors, Ghana Health Service, community-based health Centres, Department of Agriculture, Ghana Education Service, the Environmental Health Department and Beneficiaries were central in the network with the remaining actors, periphery.
CONCLUSIONS
Both regions had actors from different multisectoral backgrounds closely linked in the networks working together to reduce anaemia among WRA. Government, donor and development partners were most influential in anaemia control programming in the regions. The findings could enable potential actors working on anaemia control to identify niche(s) to support anaemia programming in the regions. Evidence from the information networks may contribute to improved communication on anaemia among WRA control in the design of initiatives that encompass relevant stakeholders.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_620

USING FORMATIVE RESEARCH TO IDENTIFY BARRIERS AND OPPORTUNITIES TO PROMOTE EXCLUSIVE BREASTFEEDING TO IMPROVE CARDIOMETABOLIC HEALTH AMONG WOMEN AND CHILDREN IN GALAPAGOS, ECUADOR

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BACKGROUND AND OBJECTIVES
Exclusive breastfeeding [EBF] may be an important strategy for improving cardiometabolic health of women and children in the Galapagos. While the World Health Organization recommends EBF for the first six months, nearly two-thirds of women in the Galapagos use commercial milk formula by 3 months postpartum. To inform a co-designed intervention to improve EBF, we used formative research methods to understand EBF experiences and preferences for intervention among women living on the island of San Cristobal.
METHODS
We conducted 20 semi-structured interviews among mothers of infants ages 6-23 months recruited purposively through clinic referrals and WhatsApp channels of trusted community stakeholders. Audio recorded interviews were conducted in Spanish, transcribed and translated to English, and thematic analysis was used to identify themes in the data.
RESULTS
Mothers were motivated to EBF to provide their baby the best nutrition, but described insufficient milk, lack of confidence, not knowing how to address nipple pain, and the convenience of commercial milk formula as key barriers. Mothers also expressed feeling uncomfortable asking providers for advice due to lack of trust. To improve EBF, mothers recommended home visits during pregnancy and postpartum that contain topics directed at the nutrition and wellness of both infants *and* mothers, have a special focus on maternal mental health, and include family members who will directly care for the baby, namely the baby's father and grandmother. They expressed a need for improved government and healthcare provider support for EBF, creation of a human milk bank, and access to electrical breast pumps. Whatsapp and Tiktok were additional preferred channels for an EBF program.
CONCLUSIONS
Women on the island of San Cristobal agreed EBF is a critical component of infant health and development, regardless of whether they themselves EBF for the first 6 months. They described multiple, modifiable barriers and provided their own solutions for how to improve EBF practices in their community. Their recommendations centered around their own wellness and use of family-based approaches supported by the local government and healthcare system. Conducting key informant interviews with health professionals, local ministry of health leaders, and family members is therefore a critical next step in co-designing an intervention to promote EBF. Findings may be relevant to other Latin American and island communities, and may have implications for rural and Latino populations globally.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_624

RELATIONSHIP BETWEEN TYPE OF DELIVERY AND GROWTH TRAJECTORY IN THE FIRST YEAR OF LIFE: THE ARARAQUARA COHORT STUDY

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BACKGROUND AND OBJECTIVES
The relationship between cesarean delivery and infant obesity is controversial. Therefore, the aim of this study was to evaluate the association between type of delivery and growth trajectory of Brazilian infants in the first year of life.
METHODS
This was a prospective cohort study conducted between 2016 and 2021 as part of the Araraquara Cohort Study that assessed quarterly anthropometry of 719 and 667 infants to evaluate respectively the effects of type of delivery on weight gain velocity (WGV) and length gain velocity (LGV) using generalised estimating equations.
RESULTS
Higher mean WGV was observed among infants born to mothers with higher education ($p \leq 0.018$), male infants ($p \leq 0.001$), and formula-fed infants ($p=0.004$), while infants with lower birth weight ($p \leq 0.001$) and diarrhoea ($p = 0.041$) had lower mean WGV. Higher mean LGV was found among non-breastfed infants and infants born to taller mothers ($p \leq 0.001$), while shorter infants had lower LGV ($p \leq 0.001$).
CONCLUSIONS
The type of delivery was not associated with infant WGV or LGV in the first year of life. Nevertheless, significant associations with maternal education, maternal height, breastfeeding practices, infant sex, and morbidity were identified.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_625

THE ASSOCIATION OF NUTRITION ON LONG COVID: A SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES

Long COVID is a consequence of acute COVID-19 that is often underdiagnosed and poorly recognized. Ten percent of people diagnosed with COVID-19 will develop Long COVID. As of April 2024, 6.9% of US adults were actively living with Long COVID. The US National Academy of Sciences, Engineering and Medicine defines Long COVID "as an infection-associated chronic condition (IACC), lasting a minimum of 3 months, that incorporates common symptoms and diagnosable conditions characteristic of Long COVID." Nutritional interventions have been identified as an important treatment for many of the Long COVID conditions. However, there has not been a comprehensive review of the impact of nutritional interventions on Long COVID. This systematic review aimed to identify the impact and gaps on nutritional studies on Long COVID.

METHODS

This systematic review was registered with PROSPERO (# CRD42023472403). Five databases were used to identify potential papers for the review (MEDLINE, Embase, Cochrane Library, Web of Science, and PsycINFO). Papers were limited to English, and abstracts, commentaries, editorials, letters, and personal narratives were excluded. The initial review searched for papers from inception of COVID-19 to October 2023. A second review identified additional papers in October 2024. Studies were assessed for potential bias. COVIDENCE was used to manage the review process.

RESULTS

5750 papers were identified with 12 duplicates. 5730 titles and abstracts were screened. 268 full texts were assessed for eligibility, and 50 studies were included in the final analysis. Most studies were observational. The most common Long COVID outcomes reported were fatigue, brain fog, and olfactory disfunction. A variety of nutrition components were studied including diet patterns, supplements, micronutrients, and fatty and amino acids. Additionally, many studies had multi-factorial interventions that incorporated nutrition. Vitamin D deficiency and malnutrition were the most studied nutrition components and were associated with long COVID.

CONCLUSIONS

This systematic review of nutrition and Long COVID found large heterogeneity between study protocols. Because many interventions were multi-factorial, it is difficult to identify nutrition's exclusive effect on Long COVID. Future randomized controlled trials with larger sample sizes that look at individual nutrition topics are needed to improve the quality of data related to nutrition and Long COVID.

CONFLICTS OF INTERESTS

Christi Piper - Nothing to declareDouglas Taren - Editor of Chief of Nutrition ReviewsJulie Long - Nothing to declareKyle Leggott - Nothing to declareLauren Grossman - Nothing to declareLouise King - Nothing to declareMyra Muramoto - Nothing to declareShari Sibenge - Nothing to declare

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EPO5_626

IS FOOD PROMOTION AND MARKETING IN THE SCHOOL FOOD ENVIRONMENT CONDUCIVE TO HEALTHY CHOICES FOR ADOLESCENTS? EVIDENCE FROM WEST AFRICA COUNTRIES

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BACKGROUND AND OBJECTIVES
Food advertising is a key component of food environment (FE) which helps driving consumer demand for sustainable and healthy food options while reducing demand for unhealthy. This study analysed how far marketing aspects of the FE of public elementary schools (PES) in Benin and Ivory Coast is conducive to healthy choices for adolescents.
METHODS
Data were collected to allow comparison North-South and Urban-Rural in Benin as well as Benin-Ivory Coast. In each locality, one PES was randomly selected, and the FE was assessed considering 1km radius around the school. All food marketing elements available in the FE were geocoded. Foods promoted were categorized considering NOVA classification and the Global Diet Quality Questionnaire. Claims and strategies used for promotion were also analysed using predefined classifications.
RESULTS
Food marketing elements density in the FE increased with the level of urbanization. Ultra-processed foods were predominant, accounting for 62.5% of promoted foods in Benin rural area in the North, 53.5% in Benin urban area in the North, and 56.6% in Benin urban area in the South, and 67.9% in urban area in Ivory Coast. Alcoholic beverages, sweetened beverages, dairy products and oils were the most promoted food groups; nutritious foods like pulses, fruits and vegetables were almost absent. Marketing strategies are dominated by brand, differentiation and segmentation strategies. Nutritional and health claims were common, particularly for ultra-processed foods.
CONCLUSIONS
School FE is dominated by ultra-processed foods marketing. This highlights the need of measures to regulate food advertising and facilitate adolescents' exposure to adequate food and nutrition messages.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_627

DIETARY BEHAVIORS AND PERCEPTIONS OF THE LOCAL FOOD ENVIRONMENT AMONG ADOLESCENTS IN A LOW-INCOME NEIGHBORHOOD

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BACKGROUND AND OBJECTIVES
The adolescent population consumes energy-dense, nutrient-poor foods. More information is needed on the local environmental factors that contribute to this consumption. The objective was to assess the relationship between dietary behaviour and perceived factors of the local food environment among adolescents.
METHODS
In a study involving 245 adolescents. The qualitative 24-hour recall method was used to measure dietary behavior. The perceptions of the food environment were measured in three dimensions of factors: the social, the physical and macro environment, with a validated questionnaire. Spearman's coefficient was used to analyse correlations between dietary behaviour and environmental factors.
RESULTS
RESULTS showed: that 58% of the adolescents were female. About 50% of the adolescents were regular consumers of fruit and vegetables, and 80% reported consumption of fried foods and sugar-sweetened beverages on the survey day. Only 10% consumed fish. In all cases, the correlations found were weak. A significant correlation ($p<0.05$) was observed between perception of food availability and fruit and vegetable consumption, while the social factor was positively correlated ($p<0.01$) with consumption of ultra-processed foods.
CONCLUSIONS
Adolescents' dietary behaviour is significantly influenced by social and physical factors in their environment. Access to healthy food and social influences are important determinants of eating habits.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_628

MALNUTRITION AND OBESITY IN PUBLIC SAFETY PERSONNEL: A CALL FOR COMPREHENSIVE HEALTH POLICY INTERVENTIONS IN PANAMA

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BACKGROUND AND OBJECTIVES
Malnutrition, including obesity, poses significant challenges to public health, affecting individuals across all demographics. Within public safety institutions, such as police, firefighters, and emergency response units, the issue is particularly concerning due to the physical and mental demands of their roles. This work aims to analyze the nutritional status, dietary habits, sleep quality, stress levels, and physical activity of public safety personnel in Panama between 2017 and 2024.
METHODS
This analysis is based on multiple cross-sectional studies conducted between 2017 and 2024, involving 538 public safety personnel, including police officers, firefighters, emergency responders, and private security agents in Panama. The studies assessed nutritional status, dietary habits, physical activity, sleep quality, and stress levels using standardized questionnaires and anthropometric measurements such as BMI, waist circumference, and waist-height ratio. Data were grouped by year of study (2017, 2019, 2022, 2023, and 2024) for comparative analysis.
RESULTS
The findings revealed high rates of overweight and obesity, affecting over 80% of participants, with obesity ranging from 37% to 58%. Abdominal obesity and cardiovascular risk exceeded 50% in several groups. Dietary patterns showed frequent consumption of fried foods (97%) and sugary beverages (94%), with low intake of fruits (16%-20%) and vegetables (20%-44%). Poor sleep quality affected 56%-94% of participants, while 19%-43% reported insomnia. Physical activity levels were insufficient (67%-85%), and stress affected 57.9%-89.6%.
CONCLUSIONS
The findings underscore the urgent need for comprehensive health interventions in public safety institutions. Addressing poor dietary habits, promoting structured physical activity, and improving sleep and stress management are critical to mitigating the high prevalence of obesity and related health risks. Tailored programs focused on nutrition education, occupational wellness, and policy reforms are essential to improving the health and operational readiness of public safety personnel.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_629

SITUATION OF THE POPULATION IN FRANCE WITH RESPECT TO NUTRITIONAL RECOMMENDATIONS: APPROACHES BY REGIONS AND OVERSEAS TERRITORIES

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BACKGROUND AND OBJECTIVES
Diet is a modifiable risk factors for many non-communicable diseases. In France, the Programme National Nutrition Santé (PNNS) aims to improve the health of the entire population by acting on this determinant since 2001. Monitoring diet recommendation's in the population is necessary to assess their health impact and adapt prevention to the needs of the population. This work presents the frequency levels of consumption of some food groups: fruits, vegetables, whole starches, pulses and sugary drinks in the adult population in France in 2021.
METHODS
The main data source was the 2021 Health Barometer survey of Santé publique France, the national public health agency. This survey was conducted on a random sample of the French population aged 18 to 75 years living in mainland France and the French overseas departments and regions. The survey methodology is based on a random generation of fixed and mobile phone numbers. Participants are selected via a two-stage random survey on a fixed line (random selection of an eligible individual per household) and a survey of the person who answers on a mobile line. The analyses consisted of comparing regional prevalences of food consumption. Logistic regressions were used to study the link between food consumption and region of residence as well as social inequalities.
RESULTS
In 2021, 19% of men and 25% of women were meeting the health recommendations for fruits and vegetables. Nearly 23% of adults consumed pulses twice a week or more, while 29% of men and 26% of women reported daily consumption of whole starches. Moreover, 18% of men and 1% of women consumed more than one glass of sugary beverages a day. Non-compliance with the recommendations, whether in terms of insufficient consumption of fruits and vegetables or consumption of sugary drinks, concerned men more than women. The prevalence of meeting recommendations improved with age and level of education except for the consumption of whole foods. Associations were also shown with the occupational status, income level, family structure and size of urban area. The regions of Hauts de France, Normandy and Grand Est had a prevalence meeting recommendation significantly lower than the hexagonal France level. The over sea territories also presented situations that differed from hexagonal France.
CONCLUSIONS
This study shows that public health nutrition policies must be adapted to the most socio-demographic characteristics and territories.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_630

FOOD AND NUTRITION EDUCATION FOR DIABETIC MELLITUS TYPE 2 PATIENTS: A NARRATIVE REVIEW

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BACKGROUND AND OBJECTIVES
Type 2 Diabetes Mellitus (T2DM) is a chronic condition with rising global prevalence, posing significant public health challenges. Effective management relies on patient education, particularly in food and nutrition. This narrative review aims to evaluate the impact of food and nutrition education programs on the metabolic control of T2DM patients, highlighting effective strategies and identifying gaps in implementation.
METHODS
This review synthesizes findings from various international studies published between 2014 and 2024. The selection criteria included randomized controlled trials, quasi-experimental studies, and observational studies focusing on education programs for T2DM management. Key outcomes analyzed were changes in HbA1c, fasting glucose levels, and adherence to dietary recommendations.
RESULTS
Personalized education programs, culturally adapted interventions, and the integration of technological tools such as continuous glucose monitoring and SMS reminders significantly improved metabolic control. Common improvements included reductions in HbA1c levels, increased adherence to low-glycemic diets, and better self-management practices. However, heterogeneity in methodologies and resource availability limited the replicability of RESULTS in low-resource settings.
CONCLUSIONS
Food and nutrition education programs are pivotal in enhancing T2DM management. Effective interventions are characterized by personalization, cultural adaptation, and ongoing patient engagement. Standardization of methodologies and the development of cost-effective strategies are necessary to expand the reach of these programs, particularly in underserved areas. Long-term follow-up is essential to assess the sustainability of improvements and the impact on quality of life.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_631

ASSOCIATIONS BETWEEN EATING BEHAVIOR AND BODY COMPOSITION IN CHILEAN COLLEGE STUDENTS: ESTUDIO CESAC

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BACKGROUND AND OBJECTIVES
Eating behavior plays an important role in the development of obesity, even in young adulthood. Nevertheless, the relationship between eating behavior and body composition at this stage has not yet been sufficiently clarified. The aim was to investigate the relationship between eating behavior and body composition in Chilean college students.
METHODS
Fifty-nine college students (19 – 26 years; 59.3% female) were included in this cross-sectional study. Data collected included body composition (InBody 120): Percent body fat and skeletal muscle mass; and eating behavior (AEBQ), which considered 8 dimensions: Enjoyment of food, food responsiveness, emotional over-eating, hunger, satiety responsiveness, slowness in eating, emotional under-eating and food fussiness. Pearson correlations were tested to assess the association between eating behavior and body composition.
RESULTS
RESULTS showed that of the 8 dimensions, participants (n=59; 22 ±1.5 years) with higher scores on emotional over-eating were associated with higher percent body fat (r= 0.326; p= 0.012). On the other hand, participants with lower scores for hunger (r= -0.370; p= 0.004) and lower scores for satiety responsiveness (r= -0.310; p= 0.017) were associated with higher skeletal muscle mass.
CONCLUSIONS
Identifying dimensions of eating behavior in college students that are related to body composition could provide effective obesity prevention strategies and weight management programs that focus on emotional and physiological aspects such as hunger and satiety and could contribute to a healthy distribution of body composition.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_632

NUTRITIONAL ASSESSMENT OF CHILEAN AND IMMIGRANT CHILDREN AND ADOLESCENTS EVALUATED BY THE NATIONAL BOARD OF SCHOOL AID AND SCHOLARSHIPS (JUNAEB) FROM 2013 TO 2023

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BACKGROUND AND OBJECTIVES
Over the past decade, the immigrant population in Chile has significantly increased, now representing 8.6% of the country's total population. Within this demographic, children and adolescents constitute approximately 13%. Our objective was to evaluate the nutritional status among Chilean and immigrant children and adolescents attending JUNAEB schools between 2013 and 2023.
METHODS
Descriptive study, analyzed individual, anonymous and de-identified data on the nutritional assessment of Chilean and immigrant children and adolescents assessed by JUNAEB. Anthropometric data, nutritional status, height diagnosis, sex, and nationality were collected from students in Pre-Kindergarten, Kindergarten, 1st grade, 5th grade, and 1st year of high school, using the JUNAEB Nutritional Map. Nutritional status categories were defined according to the WHO 2006 and 2007 criteria using the Body Mass Index-for-age z-scores (zBMI/A), grouping them into Malnourished (MN) -thinness(zBMI/A ≤ -2) and risk of thinness (zBMI/A ≤ -1)-, normal weight (zBMI/A > -1 and < 1) and Overnutrition (ON) -overweight (zBMI/A ≥ 1), obesity (zBMI/A ≥ 2) and severe obesity (zBMI/A ≥ 3)-. The diagnosis of stunting was defined with a Height-for-age z-scores (zH/A) ≤ -2.
RESULTS
The sample consisted of 8,128,014 children and adolescents, 4,002,190 (49.2%) were girls and 4,125,824 (50.8%) were boys. In 2013, immigrants represented 0.4% (n=2,463) of the total number of children evaluated, and by 2023 this percentage increased to 7.9% (n=41,230). When grouping the data, it was observed that Chilean children and adolescents had a lower proportion of MN, stunting and normal weight, but a higher proportion of ON compared to immigrants.
CONCLUSIONS
The considerable increase in immigrant children and adolescents in the Chilean school system, together with the nutritional differences between both groups, highlights the need to consider these particularities when designing public policies at the educational and health sectors focused on physical activity and healthy eating to combat malnutrition in all its forms.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_633

BRIDGING DATA AND NUTRITION: VISUAL ANALYTICS OF SCHOOL MEAL MENUS

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BACKGROUND AND OBJECTIVES

Established in 1955, the National School Feeding Program (PNAE) promotes food and nutritional security to support students' physical, cognitive, and social development in Brazilian public schools [1]. However, few tools exist to assess menu quality within the program, with the Revised Quality Index for School Meal Menus (IQCAE-R) being one of the few initiatives [2]. Therefore, this research aims to develop visual analytical tools to support the scientific study of school menu quality within the IQCAE-R framework.

METHODS

This quantitative study integrates data visualization concepts to develop an interactive Power BI dashboard. The tool allows users to cross-reference information on menu quality, analyzing variations based on region, biome, population size, education level, and the Municipal Human Development Index (IDHM). The dataset comprises 557 weekly menus (2,785 total) from Brazilian municipalities between 2022 and 2024, collected via municipal portals and school nutritionists. The sample represents 10% of municipalities in each Brazilian State, focusing on those that publicly disclose menus and on elementary education. Limited menu availability introduces potential bias.

RESULTS

Analysis revealed key regional trends. The Southeast region of Brazil, characterized by larger population sizes, outperformed others in average IQCAE-R scores, with a more consistent distribution among municipalities, as opposed to the Northeast. Southeast menus showed high average frequencies of "Cereals and Tubers", "Fruits", "Legumes", and "Vegetables", alongside low frequencies of "Sweets and Sweet Dishes", "Processed Foods", "Ultra-Processed Foods", and "Regional Sweet Dishes." However, red meat consumption remained high, while dairy product consumption was low. Other regions had lower frequencies of "Vegetables" and "Legumes" and higher frequencies of processed and ultra-processed foods. Variability was particularly evident in the frequency of the following components: (a) "Legumes" in the South and Midwest, (b) "Vegetables" in the North and Northeast, (c) "Eggs, Poultry, and Fish" in the Southeast and Northeast, (d) "Regional Foods" in the South and Southeast, and (e) "Ultra-Processed Foods" and "Red Meat" in the South.

CONCLUSIONS

Higher IQCAE-R scores were associated with regions demonstrating a more balanced food distribution, while regions with greater disparities in food access exhibited lower scores and higher consumption of processed and ultra-processed foods. These findings underscore the value of data-driven insights for public policy and broader menu disclosure.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_634

EFFECTIVENESS OF POWDERED MICRONUTRIENTS IN COMPLEMENTARY FEEDING FOR ANEMIA PREVENTION IN PRIMARY HEALTH CARE: A PRAGMATIC CLINICAL TRIAL

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BACKGROUND AND OBJECTIVES
Anemia continues to be a significant public health issue among children, particularly in vulnerable populations, requiring the evaluation of strategies for its prevention and control. Aim: To assess the effectiveness of micronutrient powders (MNP) for preventing anemia during the first year of life, distributed by health professionals at primary health care
METHODS
This pragmatic clinical trial was conducted across two health centers, involving 275 infants who were randomly assigned to either the intervention group (IG, n=135) or the control group (CG, n=135). The IG received 90 sachets of MNP to be consumed once daily for up to 180 days. Data were collected through a sociodemographic questionnaire, hemoglobin (Hb) measurements (HemoCue®), and rapid malaria tests (First Response® Malaria Antigen P. falciparum Card Test). Intention-to-treat statistical analyses were performed using Stata 18, with t-tests, Pearson's chi-square tests, and adjusted linear regression for Hb mean differences (before and after the intervention), with significance set at $p < 0.05$.
RESULTS
At baseline, infants aged 6 to 8 months had a mean Hb of 102.0 g/L (SD 11.0) in the IG and 104.0 g/L (SD 11.0) in the CG. Anemia rates (Hb <110 g/L) were 74% (95% CI 66–80) in the IG and 66% (95% CI 58–74) in the CG. After the intervention, at 12 to 14 months, the IG had a mean Hb of 106.2 g/L (SD 10.6) and an anemia prevalence of 56% (95% CI 48–66), while the CG had a mean Hb of 99.5 g/L (SD 11.7) and an anemia rate of 79% (95% CI 70–85). After adjusting for variables such as child's age, wealth index, maternal age and education, prenatal visits, and stunting at baseline, the IG showed an increase in the adjusted mean Hb difference of 0.28 g/L (95% CI 0.02–0.55), while the CG showed a decrease of -0.43 g/L (95% CI -0.72 to -0.15).
CONCLUSIONS
The findings suggest that MNP supplementation, when distributed by health professionals, has a positive impact on hemoglobin levels, underscoring the importance of nutritional interventions in regions with high anemia prevalence during infancy.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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NUTRITIONAL STATUS AND MENARCHEAL AGE OF ADOLESCENT GIRLS

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BACKGROUND AND OBJECTIVES
The Nutritional status of adolescent plays an important role in determining the maturation status. The mean age of menarche has declined over the last century, but the magnitude of the decline and the factors responsible remains subjects of contention. This study assessed the nutritional status of adolescent girls within the age range of 10 to 18 years and their mean menarche age determined.
METHODS
In this descriptive cross sectional study, the total sample size of three hundred (300) girls were selected using a convenience sampling technique and subjected to anthropometric assessment by taking measurements of their weight to the nearest 0.1kg using a calibrated mechanical weighing scale, height using a stadiometer, waist circumference and hip circumference using a non-stretchable measuring tape. Each measurement was repeated twice and the average calculated also the Body Mass Index (BMI) and the Waist to Hip Ratio (WHR) were calculated. A semi structured questionnaire was used to collect data on menarche status which included demographic information and socioeconomic data. A 24-hour multi-pass diet recall method was used to assess the dietary intake. The estimation of nutrient intake was analyzed using the Total Dietary Assessment (TDA) software and the World Health Organisation (WHO) anthroplus. Data gathered were coded and analyzed using the IBM-Statistical Package for Social Sciences (SPSS) version 20 and Microsoft Excel 2007.
RESULTS
The mean age of menarche was 13.4± 1.4 years and a median of 14years. The mean waist circumference and Hip circumference were significantly higher among girls that have started menstruating as compared to the non-menstruating. Only 11.1% of the females were menstruating and those who attained menarche showed a higher significant mean percent of body weight 72% as compared to the non-menstruating ones 28%. Dietary intake showed that the respondents met more than 100% for carbohydrates, fat, vitamin A and iron while Protein, calories, fibres, vitamin C, and calcium are below RDA. The respondents consumed more of roots and tubers, Cereals, less of protein rich foods and less of fruits and vegetables.
CONCLUSIONS
The nutritional status of adolescent girls had a significant relationship with the onset of menstruation and the menarche age. Therefore, there is a link between the nutritional status of the girls and attainment of menarche hence, a database on the health and nutritional status of adolescents should be established.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_636

CHARACTERISTICS OF JAPANESE JUNIOR RUGBY TEAMS PROVIDING NUTRITION SUPPORT: AN INTERNET SURVEY

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BACKGROUND AND OBJECTIVES

In 2021, we conducted an internet-survey of coaches and families of Japanese junior rugby players regarding conditioning support. This study aimed to investigate the characteristics of teams providing nutrition support to Japanese junior rugby players.

METHODS

This web-based cross-sectional study recruited participants using snowball sampling, informed them of the URL to access the survey screen, and asked them to respond. The evaluation items included the coach's age, team's competitive goal level, region, player's grade, number of players, and implementation of non-nutritional conditioning support. Non-nutritional conditioning support comprised of 13 categories: first aid; condition management and infectious disease control; anti-doping; medical check-up; strength training; injury prevention; rehabilitation for injury recovery; biomechanics; performance assessment; psychological; sleep; countermeasures for heat, cold, and high altitude; and female-specific health problem.

RESULTS

The survey included 778 participants (531 men) comprising 338 coaches, 324 families, and 116 participants in both roles. In total, 212 (27.2%) participants answered that they provided nutrition support, whereas 566 (72.8%) answered that they did not. The higher the competitive goal level, the higher the percentage of nutrition support provided ($p<0.001$). In Tokyo, team provided more nutrition support than those from other regions ($p<0.01$). Teams that included high school students were more likely to provide nutrition support ($p<0.001$), whereas teams that included junior high school or younger students were less likely to provide nutrition support ($p<0.001$). Those who responded providing nutrition support provided other conditioning support, with significant differences ($p<0.001$) across the 12 items except for female-specific health problem.

CONCLUSIONS

Our findings showed that nutrition support status differs depending on team characteristics. Team characteristics may be necessary to increase nutrition support for junior rugby players.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO5_637

REGIONAL AND ULTRA-PROCESSED FOOD CONSUMPTION: IMPACTS ON LIPID PROFILES OF AMAZONIAN CHILDREN

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BACKGROUND AND OBJECTIVES
The Brazilian Amazon has experienced a significant nutritional transition characterized by increased consumption of ultra-processed foods (UPFs) and reduced intake of regional foods. Given the robust evidence linking UPF consumption to adverse health outcomes, this study aimed to investigate the associations between the consumption of regional foods, UPFs, and the lipid profiles of school-aged children in Western Amazonia.
METHODS
We conducted a cross-sectional study of 245 children aged 7–8 years. Dietary data, collected via a tailored food frequency questionnaire, categorized foods into UPFs, regional foods, and fruits, vegetables, and legumes (FVL). Regional foods included açaí, buriti, tapioca, and manioc flour; UPFs included soft drinks, packaged snacks, and instant noodles. Composite scores for each food group were generated. Lipid profiles—total cholesterol, LDL cholesterol, and HDL cholesterol—were assessed using fasting venous blood samples (8–10 hours). Associations between dietary patterns and lipid profiles were analyzed using multiple linear regression, adjusting for confounders.
RESULTS
Dyslipidemia was prevalent among participants, with 47% of children had elevated total cholesterol (≥170 mg/dL), 35% had elevated LDL (≥110 mg/dL), and 23% showed HDL insufficiency (<40 mg/dL). Dietary patterns reflected a broader nutritional transition: 46% consumed fewer than one regional food item daily, while 98.5% consumed at least one UPF daily, and 62% had no daily intake of vegetables or legumes. Higher FVL consumption was linked to reduced LDL (−3.39 mg/dL; $p<0.05$) and total cholesterol (−3.91 mg/dL; $p<0.05$). Greater regional food intake was associated with reduced LDL (−2.38 mg/dL; $p<0.05$) and total cholesterol (−2.46 mg/dL; $p<0.05$). Higher UPF consumption (≥75th percentile) correlated with lower HDL levels (−2.40 mg/dL; $p<0.01$).
CONCLUSIONS
Dietary patterns emphasizing regional foods and FVL and reducing UPFs were associated with improved lipid profiles in school-aged children from Western Amazonia.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_642

KHAT USE, DIETARY PRACTICES, AND NUTRITION AMONG PREGNANT WOMEN IN ETHIOPIA

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BACKGROUND AND OBJECTIVES
Khat has long been consumed in East Africa for its psychoactive effects and social practices. Although use is more prevalent among men, consumption among women is rising. In certain regions, khat use during pregnancy has become socially accepted. Studies in Ethiopia reported between 19% to 66.9% of pregnant women surveyed used khat. Khat use is known to suppress appetite in animals and humans. Consumption during pregnancy is associated with adverse outcomes including anemia, low birth weight, and perinatal mortality. Adequate nutrition during pregnancy is critical for maternal and child health. In Ethiopia, where maternal and infant mortality rates are high, khat use may further contribute to these issues. This study explores relationships between khat use, dietary practices, and nutrition among pregnant women in the Oromia region of Ethiopia, where khat consumption is prevalent and nutritional challenges are significant.
METHODS
This cross-sectional mixed methods study was conducted in Haramaya District of Ethiopia using questionnaires and focus group discussions in July 2023. Questionnaires assessed socio-demographic information and diet, including khat use. Diet was assessed using the Minimum Dietary Diversity for Women (MDD-W). Data were analyzed using SPSS v28 and NVivo 14. Thematic analysis was conducted to capture salient themes within the FGDs.
RESULTS
In this study of 444 pregnant women, 66.9% reported consuming khat while pregnant. MDD-W scores ranged from 1 to 6 (median 3). No significant difference in MDD-W scores was found between women who use khat and those who do not. Five themes manifested from data around nutrition: Substitution of Khat for Meals, Maternal Nutrition, Child Malnutrition, Skipping Meals for Economic Survival, and Health Risks from Khat Use.
CONCLUSIONS
Khat use among pregnant mothers in these communities contributes to significant nutritional challenges, as it often substitutes for meals and exacerbates deficiencies such as anemia. Dietary diversity is low in this region, and measures like the MDD-W are limited, as they do not assess quantity or frequency of food consumed. If khat suppresses appetite, the quantity and frequency of food intake may be even lower among women who use khat, further increasing their risk of micronutrient deficiencies. Economic reliance on khat for income limits access to adequate food, negatively impacting maternal and child nutrition.Despite its role as a stimulant, khat dependency perpetuates a cycle of poor health, inadequate dietary intake, and compromised maternal and child well-being.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_644

ASSOCIATION BETWEEN CHRONONUTRITION AND PARAMETERS FOR ASSESSING GLYCEMIC CONTROL IN PREGNANT WOMEN WITH PREGESTATIONAL DIABETES MELLITUS

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BACKGROUND AND OBJECTIVES
Diabetes Mellitus (DM) confers a higher risk of adverse maternal and fetal outcomes, mainly related to the degree of hyperglycemia. In order to achieve glycemic targets, strategies are used that take into account, in addition to nutritional composition, the interaction between the circadian cycle and nutrition, an interaction defined as chrononutrition [1,2,3,4]. Therefore, the aim of this study was to investigate the association between chrononutrition and glycemic outcomes throughout the pregnancy of women diagnosed with pre-gestational DM.
METHODS
This was a cross-sectional study nested in a randomized clinical trial with 117 pregnant women with pre-gestational DM, assisted by a public maternity hospital between 2016 and 2024. Dietary intake was assessed using 24-hour recalls in the second and third trimesters of pregnancy. Chrononutrition parameters were: number of eating episodes, eating pattern, meal times and total daily, daytime, nighttime and per-meal calorie intake. The glycemic outcomes were: fasting plasma glucose and glycated hemoglobin in the second and third trimestres [5]. After the normality test, the Mann-Whitney U-test and the Kruskal-Wallis test were used to test the difference between the medians of the independent variables. Multivariate linear regression models evaluated the associations between chrononutrition and glycemic indicators in each trimester.
RESULTS
As a result, a higher evening calorie intake was associated with an increase in fasting glycemia in the 2nd trimester (adjusted ß=0.05;p=0.006) and in the 3rd trimester (p=0.027). Pregnant women with a higher calorie intake at dinner in the 2nd (p=0.006) and 3rd trimesters (p=0.049) had fasting hyperglycemia. In the 3rd trimester, the nocturnal eating pattern was positively correlated with an increase in glycemia (adjusted ß= 23.77; p= 0.008). A greater number of evening meals had a protective effect on glycemia in the 2nd trimester (p=0.033). A higher calorie intake, day or night, total or by meals, was related to an increase in fasting glycemia in both trimesters. The proximity between a snack and a meal with more calories seemed to help control glucose and glycated hemoglobin in the 2nd and 3rd trimesters. These RESULTS suggest the importance of an adequate distribution of calories throughout the day associated with a lower caloric intake at night.
CONCLUSIONS
The findings suggest that chrononutrition has an influence on the glycemic control of pregnant women with pre-gestational DM.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_645

ADVANCING PUBLIC HEALTH AND NUTRITION THROUGHOUT THE LIFECYCLE THROUGH PUBLIC-PRIVATE PARTNERSHIPS

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BACKGROUND AND OBJECTIVES
The role of nutrition in achieving Sustainable Development Goals (SDGs) requires urgent acceleration. While progress has been made through human rights and development agendas, persistent public health nutrition challenges in the Global South call for innovative solutions. Public-private partnerships (PPPs) are crucial for aligning public sector goals with private sector resources and expertise to address service delivery gaps and promote sustainability. These partnerships aim to enhance Public health and nutrition (PHN) outcomes across the lifecycle in line with global priorities.The role of nutrition in achieving Sustainable Development Goals (SDGs) requires urgent acceleration. While progress has been made through human rights and development agendas, persistent public health nutrition challenges in the Global South call for innovative solutions. Public-private partnerships (PPPs) are crucial for aligning public sector goals with private sector resources and expertise to address service delivery gaps and promote sustainability.
METHODS
This study evaluates key public-private partnership case studies in health initiatives, with a focus on India, to assess their impact on public health and nutrition outcomes.
RESULTS
PPPs in India have successfully delivered lifecycle-based health and nutrition services through:

- **Poshan 2.0 (Saksham Anganwadi Services Scheme):** Enhanced supplementary feeding, referral services for children and pregnant women using private sector support and digital monitoring.
- **Fortified Rice Initiative:** Improved fortified rice supply chains via the Public Distribution System, addressing micronutrient deficiencies among vulnerable population.
- **National Health Mission:** Expanded access to healthcare in remote areas through telemedicine and mobile health vans, improving maternal and child health.
- **Eat Right India:** Promoted healthy, sustainable diets through food fortification, labeling, and public awareness campaigns.

CONCLUSIONS
Strengthening PPPs in the Global South is vital for scalable, sustainable solutions that enhance Public health nutrition outcomes across the lifecycle while addressing poverty, health inequities, and climate resilience.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_647

IMMIGRATION AND NUTRITIONAL DISPARITIES: A MULTILEVEL ANALYSIS OF CHILD BMI-FOR-AGE IN CHILE

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BACKGROUND AND OBJECTIVES
Over the past decade, Chile has witnessed a significant increase in international immigration. Immigrant children and adolescents face unique health challenges, particularly when exposed to insecure or adverse social conditions. This study aimed to assess the influence of immigration status on Body Mass Index-for-age z-scores (zBMI/A) among Chilean and immigrant boys, girls, and adolescents (BGA) attending schools evaluated by the National Board of School Aid and Scholarships (JUNAEB) in 2023.
METHODS
This cross-sectional study included 523,899 BGA. A multilevel hierarchical linear model was employed to account for the nested data structure, with individual observations (level 1) grouped by school grade (Pre-Kindergarten, Kindergarten, 1st grade, 5th grade, and 1st year of high school) across public and subsidized private schools in Chile (level 2). Statistical significance was set at $p < 0.05$ for all two-sided tests.
RESULTS
The median age of participants was 7.2 years (IQR: 5.9–11.4), with 49.1% females and 7.9% identified as immigrants. The overall mean zBMI/A was 1.03 (95% CI: 1.02–1.03). Chilean BGA presented a mean zBMI/A of 1.07 (95% CI: 1.06–1.07), whereas immigrant BGA had a mean of 0.53 (95% CI: 0.52–0.55). Immigration status was significantly associated with lower zBMI/A ($\beta = -0.56$; 95% CI: -0.57 to -0.54; $p < 0.01$).
CONCLUSIONS
Immigrant BGA in Chile exhibit significantly lower zBMI/A compared to their Chilean peers. These findings underscore the need for inclusive public health policies tailored to the nutritional and physical activity needs of both Chilean and immigrant schoolchildren. Strengthening school-based programs promoting healthy eating and physical activity is essential to address malnutrition in all its forms.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_648

SLEEP DURATION AND DIETARY INTAKE IN MEXICAN ADULTS

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BACKGROUND AND OBJECTIVES
Sleep is considered one of the three main components of the lifestyle, which, together with diet and physical activity, is essential for the maintaining of health, and it is recognized as a modifiable risk factor involved in the aetiology of obesity and cardiometabolic diseases. Short sleep has been associated with a higher intake of less healthy foods and beverages and a lower intake of healthier foods. Sugar-sweetened beverage (SSB) intake in Mexico is among the highest worldwide (163 L/per capita), while corn is the primary staple food (346 kg/per capita). Because of the carbohydrate content in SSB and refined corn products, there is concern about their relationship with sleep duration in Mexican adults.**Objective:** To analyse the relationship between dietary intake and sleep duration in Mexican adults.
METHODS
This one-month study includes 72 healthy, diet and weight-stable adults (37 women and 35 men, BMI ≥ 18.5 kg/m2, aged 18 - 50 y). At enrolment, information on lifestyle variables was collected through a questionnaire. Anthropometric measurements were performed weekly, and dietary intake was reported by four non-consecutive 24 four dietary recalls, three on different weekdays and one on weekends. Participants completed a 7-day actigraphy record, and sleep duration was objectively assessed using MotionWare software. The parameters evaluated were time in bed, sleep period, sleep duration and latency in minutes, percentage of sleep duration and efficiency, and sleep fragmentation index.
RESULTS
Sleep duration was 6:07 ± 0:51 h: mm. Median (IQR) intake were: total energy 2037 kcal/d (1559, 2341 kcal/d), fat 80 g/d (62, 97 g/d), total sugar 82 g/d (62, 105 g/d), added sugar 55 g/d (30, 75 g/d), corn 111 g/d (77, 166 g/d), sugar-sweetened beverages 333 ml/d (113, 665 ml/d), and red meat 78 g/d (34, 112 g/d). Multivariate regression analysis showed a predictive model including energy intake, fat, total sugar, added sugar, plant protein, corn, poultry, dairy, fish, and red meat significantly impacting sleep duration (adjusted R2= 0.310).
CONCLUSIONS
Sleep duration is shorter than recommended (7 – 9 hr). Predictive variables for sleep duration include healthier and less healthy food. These findings will provide valuable data to comprehend the relationship between sleep duration and dietary intake in Mexican adults.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_649

USING THE DIFFUSION OF INNOVATION THEORY TO UNDERSTAND HOW LACTATING MOTHERS WITHIN SIX-MONTH AFTER DELIVERY WERE EXPOSED TO INFANT FORMULA INFORMATION WHICH INFLUENCED INFANT FORMULA ADOPTION IN PALAWAN, THE PHILIPPINES

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BACKGROUND AND OBJECTIVES
Exclusive breastfeeding (EBF) is essential for both maternal and infant health. However, the EBF rate in the Philippines is only 29%. Infant formula (IF) marketing and communication channels have been reported to influence EBF.
METHODS
To understand how IF information is disseminated through different communication channels and how social systems influence exposure to IF information and adoption through the Diffusion of Innovation Theory (DoI), this study used maximum variation sampling to select 16 communities in both urban and remote areas in Palawan. Interviews were conducted with 104 lactating mothers and key informants such as IF sellers, community leaders, and health workers. The interviews were coded inductively first and then categorized deductively by DoI.
RESULTS
The RESULTS show that while TV remained the most popular communication channel for IF information, urban areas have better infrastructure, such as the internet and transportation, allowing more access to online and face-to-face IF information than remote areas. Social systems drove more women to work outside of the home due to poverty and inflation, making urban working mothers the most vulnerable group to be exposed to and adopt IF.
CONCLUSIONS
This study is only partially consistent with existing literature, which is mostly conducted in urban settings. The rapid development of communication channels has reduced the role of print media in IF information dissemination. Samples from remote areas and those in poverty have reduced access to infrastructure for receiving IF information. Policymakers should consider the significant gaps between remote and urban areas when promoting EBF. Scholars should consider infrastructure gaps when applying DoI.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_650

ADAPTATION AND DESCRIPTION OF A DIET QUALITY INDICATOR FOR APPLICATION IN NURSING HOMES AND DAY CARE CENTERS IN GUATEMALA: QUALITY INDEX FOR NUTRITION IN NURSING HOMES AND DAY CARE CENTRES, QUINNDC-GUATEMALA

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BACKGROUND AND OBJECTIVES
A balanced diet is crucial for maintaining the health of the elderly, as it prevents nutritional deficiencies, mitigates the risk of chronic diseases, and enhances their overall quality of life. In Latin America, particularly in Guatemala, no indicator is specifically designed to evaluate nutritional quality in care institutions. This study aimed to adapt the Dietary Quality Indicator (DQIn) to assess the nutritional standards of institutions serving the elderly in Guatemala.
METHODS
Based on the original QUINN (developed and applied in a Nursing Home, NH in Spain), an adaptation, Quality Index for Nutrition in Nursing Homes and Day Care Center, QUINNDC-Guatemala, was proposed. A Rapid Review of dietary guidelines for the elderly in Latin America was conducted. The main findings were reported according to PRISMA (2020) guidelines. The MEDLINE database (PubMed) retrieved the main references and Google Scholar for the gray literature.
RESULTS
After screening the main references (N=44 MEDLINE, and N=165 Google Scholar), dietary reports and guidelines from different Latin American countries were selected (N=24, articles, dietary guidelines, and scientific-technical reports). Four dietary guidelines from Mexico, Bolivia, Colombia, and Argentina were selected to adjust the frequency of consumption and portion size. The QUINNDC-Guatemala included 15 components: 11 were basic (vegetables, fruits, legumes, cereals, dairy products, white fish, white meat, and eggs; positive; and oils and other fats, sweets and red meat and meat products, negative) and 4 special and positive components (variety of vegetables and fruits, blue fish, whole grains and olive oil; it was included in this category due to its low frequency in the usual diet of this country). For the scoring system, the consumption frequencies of the components were adapted (number of servings), with changes towards a higher consumption of legumes and cereals and a decrease in the frequencies of white fish, seafood, and oily fish, to the original QUINN. Each component was classified into 4 categories (0, 1, 2, or 3 points, with a total score 0-45 points). The categories proposed, based on the original QUINN are: "very low" (0 to 8 points), "low" (9 to 17 points), "moderate" (18 to 26 points), "good" (27 to 35 points) and "very good" (≥36 points).
CONCLUSIONS
The adaptation of the new DQIn, QUINNDC-Guatemala might offer a more effective means of assessing dietary quality and implement nutrititon interventions for elderly in Guatemala.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_651

EVALUATION OF NUTRITIONAL PROFILE IN A GROUP OF WOMEN WITH DIABETES AT TWO MONTHS POSTPARTUM

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BACKGROUND AND OBJECTIVES
Breast milk remains the ideal food for infants. The mother's diet may have an impact on milk production. Hence the importance of nutritional education for all breastfeeding women with diabetes. The aim of our study was to evaluate the nutritional profile of a group of diabetic women at two months postpartum (T2).
METHODS
We conducted a descriptive observational cross-sectional study in women with type 1 or type 2 diabetes, followed at the Department of Nutritional Diseases "D" of the National Institute of Nutrition of Tunis, attending a follow-up consultation T2 and accepted to join the study. We collected data through anamnesis, clinical examination, and each patient completed a food questionnaire.
RESULTS
Fifty-two patients were included in the study. The mean age of patients was 35.4±0.4 years, with extremes ranging from 23 to 44 years. The majority (80%) had type 2 diabetes, while 20% had type 1 diabetes, diagnosed before pregnancy. At T2, we noted exclusive and partial breastfeeding rates of 44% and 33%, respectively. The average caloric intake was 2086 kcal/day, with extremes ranging from 1240 to 3820 kcal/day. Women who exclusively breastfed their babies had a lower caloric intake compared to women who did not breastfeed or partially breastfed their babies ($p<0.001$). Nearly half of the women had a hypercarbohydrate and hyperprotein diet, regardless of breastfeeding modality. Half of the non-breastfeeding women had a hyperlipidic diet, whereas only 25% of the breastfeeding women had an excessive lipid intake. Women who did not breastfeed their babies had an insufficient daily intake of phosphorus ($p=0.03$). Regarding the other micronutrients, we did not find any statistically significant differences. We did not identify a statistically significant association between average dietary fiber intake and breastfeeding practices.
CONCLUSIONS
These findings highlight the importance of nutritional education for all breastfeeding diabetic women to ensure sufficient intake of both micro- and macronutrients and to prevent weight gain.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_652

STRENGTHENING DOCTORAL TRAINING IN AFRICA: INSIGHTS FROM A NUTRITION-FOCUSED PROGRAM

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BACKGROUND AND OBJECTIVES
Doctoral training in Africa is expanding, but challenges such as insufficient funding and a lack of researchers in many fields persist. Navigating the PhD journey is demanding, with mentorship, supervision, and guidance playing pivotal roles in student success. A Support Program for PhD Students was established in 2019, offering complementary training to first-year PhD students in human nutrition across Africa. The program equips participants with essential research skills and prepares them to navigate the complexities of their academic journey effectively.
The program focused on critical research components, including protocol development, research methodology, population and sampling, data capturing and analysis, presentation skills, and scientific writing. These competencies were delivered through a 10-week online program, accompanied by weekly virtual face-to-face sessions, followed by a six-day intensive in-person workshop held in October in Potchefstroom, South Africa.
METHODS
The evaluation of the program spanned its four iterations (2019, 2022, 2023, and 2024). Data were collected on participant demographics and progress. Descriptive feedback from the participant's evaluation of the program was analysed quantitatively and qualitatively.
RESULTS
Since its inception, 79 participants from 15 African countries have completed the program, with Ghana, South Africa, Kenya, and Nigeria contributing the highest numbers. The mean age of participants was 36.8 years, and 57% were female. Notably, nine participants have successfully completed their PhDs since attending the program.
Descriptive feedback from participants highlighted the program's value, with words such as informative, insightful, challenging, practical, interactive, and fun recurring frequently. These reflections underscore the program's ability to foster personal and professional growth while maintaining an engaging and supportive environment. The need for continued mentoring and support after the program was a common request from participants.
CONCLUSIONS
The Support Program for PhD Students in Africa has proven to be an effective initiative, addressing critical gaps in doctoral training. By providing robust methodological training and fostering a collaborative network of early-career researchers, the program enhances the capacity for high-quality, impactful research. Future iterations will continue to build on participant feedback and explore expanded access to further amplify its reach and impact.
CONFLICTS OF INTERESTS
No conflict of intererst for any of the authors. Declaring that funding for this program has come from various funders, including North-West University, The Nutricia Research Foundation, Gioventu Foundation, Van Dam Foundation and partial self-funding by the participants and their institutions.

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EPO5_654

MOTHERS' DIETARY BELIEFS ABOUT COMPLEMENTARY FEEDING IN HIGH ANDEAN AREAS IN AN UPPER MIDDLE-INCOME COUNTRY

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BACKGROUND AND OBJECTIVES
Currently, social and cultural beliefs (symbolisms), related to food, are studied, as they influence the choice and exclusion of food. The beginning of children's nutrition should be understood in its context (cultural and ethnic), mainly in the value attributed to food. It is important to study beliefs, since they generate resistance to the recommendations given on infant feeding. The aim of the study was to identify the dietary beliefs of mothers of children aged 6 to 23 months attending health facilities in high Andean areas of an upper middle-income country
METHODS
Qualitative, descriptive study with mother-child dyads, developed between October 2023 to January 2024. Twenty semi-structured interviews were applied to mothers of children aged 06 to 23 months in health facilities in high Andean areas of a LIMC
RESULTS
Dietary beliefs regarding complementary feeding were positive and negative. The former were related to the well-being of the organism, offering granadilla and chairo (based on dehydrated tuber) as stomach protector at the beginning of feeding, and other foods considered to have healing properties.
In the negative beliefs, they avoided citric fruits and eggs, because of possible damage to teeth and colic respectively; also Andean grains treated with lime because of damage to bones; foods such as sangrecita, cheese and banana because they affected the development of speech. Before 6 months they introduced liquid foods early due to possible cravings or hunger.
CONCLUSIONS
In the positive beliefs, foods were considered for their attributes (nutritional value, physical aspects and healing effects). In the negative beliefs, foods were avoided because they could affect the organism or its development
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_660

MEDITERRANEAN DIETARY PATTERN IS ASSOCIATED TO MENTAL HEALTH SYMPTOMS IN A BRAZILIAN SAMPLE OF ADULTS: CROSS-SECTIONAL ANALYSIS FROM CLINICAL CARE SETTING

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BACKGROUND AND OBJECTIVES
The Mediterranean dietary pattern has been associated with positive mental health symptoms outcomes, however, studies from countries that are not from the Mediterranean region showed mixed RESULTS. Thus, evaluating the Mediterranean dietary patterns with mental health in a country other than the Mediterranean region, i.e., Brazil, can provide direction to target strategies.
METHODS
A cross-sectional study with 199 (71.36% females; Mage= 31.34±9.12yo) individuals from a clinical care setting in São Paulo, Brazil, was carried out. Anxiety and depression were evaluated using the Becky inventories and sleepiness with the Epworth Sleepiness Scale. A 78-item food frequency questionnaire was used to calculate the Mediterranean dietary score (MDS). Descriptive statistics and linear regression models were used to verify possible associations. The significant tests were set at $p<0.05$ and performed in R Studio (version 2023).
RESULTS
Participants' mean score for MDS was 4.89/9 showing that younger adults presented better adherence than older adults. Individuals in the highest vs. lowest tercile for total MDS provided an increased prevalence for meeting fruits (51.52 vs. 22.22%), vegetables (52 vs. 26%), beans (49 vs. 23%), cereals (46 vs. 34%), mono-unsaturated/saturated ratio (54.46 vs. 20.79%) and dairy products (45 vs. 30%). After adjustment for potential confounding factors, individuals in the highest tercile of adherence to MDS were less likely to have depressive symptoms (ß = -2.99; 95%CI -5.61; -0.39). For anxiety and sleepiness symptoms, respectively, non-significant negative (ß = -2.52; 95%CI -5.35; -0.30) and positive (ß = -0.59; 95%CI -0.62; 1.78) associations were found with total MDS.
CONCLUSIONS
The Mediterranean dietary pattern, when assessed among Brazilian adults, showed associations consistent with findings from studies conducted in the Mediterranean regions, particularly in the protective potential role against depressive symptoms. This could be explained by similarities in dietary habits, such as the widespread availability and consumption of fruits and vegetables in Brazil, which contribute to a higher-quality diet and favourable mental health outcomes. However, to strengthen these findings and explore potential cultural and regional differences further, future research with larger, more diverse samples and longitudinal designs is essential.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_661

INNOVATIVE LASER HEIGHT AND LENGTH MEASURING DEVICE FOR CHILDREN TESTED IN VIETNAM

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BACKGROUND AND OBJECTIVES
Accurate anthropometric measurements are essential for proper nutrition assessments, and timely referral of malnourished children to health services. Height/length measurement is important for indicating if a child is wasted and/or stunted. Height/length has always been the most difficult anthropometric measurement to take accurately because children sometimes refuse to be placed on the gold standard wooden height boards, young children cannot stand still, tape measurements are difficult to read, and measurers lack capacity to ensure all steps are followed in measuring height or length accurately. The wooden height boards are also large and heavy to carry in the field. To date, different technologies were used to improve accuracy of height/length measurement, but none have been successful in ensuring ≥99% accuracy and precision. A patented innovative triple laser technology was used to develop a prototype laser device (LD) and was tested in Vietnam in this validation study.
METHODS
With proper training, one group of master measurers and one group of CHVs (3 people each) took length/height measurements two separate times with a wooden height board (WHB) and LD at a growth monitoring and promotion site and a third time when the difference between the first and second measurement was greater than 0.7 cm (1). A total of 85 children 6-59 months was measured in Dakrong and Huong Hoa community. Inter-Technical Error of Measurement (TEM) and Intra-TEM was measured using the Bland-Altman Bias and Lin's Concordance Correlation Coefficient to measure accuracy and precision, respectively.
RESULTS
The correlation between the WHB and LD was very high (OCCC≥0.997) showing greater than 99% precision when using both the WHB and laser device to measure length and height. For accuracy, the inter-TEM and intra-TEM were all within the acceptable threshold of 0.7cm difference for length and height measurements for both the expert and CHW measurements. The laser device further saved about 30% time in height and length measurements per child.
CONCLUSIONS
The triple laser technology shows promising accuracy and precision in measuring lengths and heights of children in low- and middle- income countries even when CHVs are measuring. The new LD design is much lighter in weight, easy to transport, and lower in cost than the WHB. Thus, the LD seems to be a viable alternative to the WHB. Further research with a larger sample size would help the validation of the device further.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_662

MOBILE PHONES REDUCE VOLUNTEER WORKLOAD AND CHILD MALNUTRITION IN PERI-URBAN CAMBODIA'S POSITIVE DEVIANCE HEARTH PROGRAM

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BACKGROUND AND OBJECTIVES
Child undernutrition in Cambodia is a persistent public health problem requiring low-cost and scalable solutions. Rising cellphone use in low-resource settings represents an opportunity to replace in-person counseling visits with phone calls; however, questions remain on relative effectiveness. Our objective was to evaluate the impact of two options for delivering a World Vision infant and young child feeding (IYCF) counseling program: 1) traditional Positive Deviance/Hearth (PDH) program with in-person visits or 2) PDH with Interactive Voice Calling (PDH-IVC) which integrates phone calls to replace 62.5% of face-to-face interaction between caregivers and volunteers, compared to the standard-of-care (SOC).
METHODS
A longitudinal cluster-randomized controlled trial was conducted with 361 children aged 6-23 months. An adjusted difference-in-difference approach was used comparing baseline with midline (3 months) and endline (12 months) surveys to evaluate impact on child growth among the three groups.
RESULTS
At baseline, nearly a third of children were underweight and over half were food insecure. At midline the PDH group and the PDH-IVC groups had improved weight-for-age z-scores (0.13 DID, p=0.011; 0.13, p=0.02, respectively) and weight-for-height z-score (0.16 DID, p=0.038; 0.24, p=0.002), relative to SOC. There were no differences in child height-for-age z-scores. At endline, impact was sustained only in the PDH-IVC group for weight-for-age z-score (0.14, p=0.049) and the prevalence of underweight declined by 12.8 percentage points (p=0.036), relative to SOC.
CONCLUSIONS
Integration of phone-based IYCF counseling or follow-up for nutrition programs may potentially be a promising solution to reduce the burden of in-person visits by community health workers. Furthermore, with the program impact pathway analysis conducted for this study, caregiver mental health may have resulted in the modest improvements in child nutrition suggesting the need to combine PDH with other mental health interventions in Cambodia's setting to improve child nutrition.
CONFLICTS OF INTERESTS
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EPO5_663

ASSOCIATIONS BETWEEN LIVE DIETARY MICROBE INTAKES AND HEALTH OUTCOMES, ANALYSES OF THE KHANES 2016-2020 DATA

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BACKGROUND AND OBJECTIVES
The consumption of live microbes, beyond probiotics, is associated with health benefits (1,2). This study aimed to quantify live microbe intake in 2016-2020 Korea National Health and Nutrition Examination Survey (KNHANES), and to investigate the associations between live microbe intake and health outcomes.
METHODS
We developed a KNHANES live microbe classification system based on the Sanders system (3) and divided KNHANES food codes that overlapped with NHANES into four categories: no live microbe or low (<10^4 CFU/g), medium (10^4–10^7 CFU/g), and high (>10^7 CFU/g) levels. Microbe data on various types of kimchi were obtained from World Kimchi Institute and data on other non-overlapping food codes were determined based on literature and authoritative reviews. We performed descriptive analyses on live microbe intakes among adults aged 19 years and older. We then conducted survey-weighted adjusted regression analyses to evaluate the relationship between live microbe intake and cardiometabolic health outcomes (cholesterols, tryglycerides, blood pressure, fasting blood sugar, C-reactive protein, and waist circumference), controlling for age, sex, body mass index, household income, physical activity level, current smoking status, and alcohol intake.
RESULTS
The mean daily intake of medium live microbe foods was 179.48 g in Korean population, while high live microbe foods averaged 122.49 g. Kimchi contributed a significant portion, with a mean intake of 102.44 g. An additional 100-g intake of medium or high live microbe–containing foods was associated with a lower C-reactive protein (coefficient: -0.006; 95% CI: -0.01, -0.002 mg/dL). The association was larger for kimchi foods (coefficient: -0.044; 95% CI: -0.05, -0.039 mg/dL). No significant associations were found with other outcomes.
CONCLUSIONS
This study provides new data on dietary intakes of live microbes and their potential health benefits in a nationally representative data set of Korean adults.

Table 1. Adult intake of foods with live microbes (g/d), KNHANES 2016-2020

Food category	No. of subjects	Mean	Median	75th %tile	90th %tile
Medium	24,505	179.48	38.30	223.85	594.66
High	24,291	122.49	86.00	173.20	281.00
Kimchi	23,336	102.44	73.28	145.50	243.00
Non-kimchi High	5,741	20.05	0.00	0.00	72.61

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_664

PREVALENCE OF VITAMIN A DEFICIENCY AND ASSOCIATED RISK FACTORS IN MONGOLIAN CHILDREN AGED 6-59 MONTHS: FINDINGS FROM MONGOLIA'S VI NATIONAL NUTRITION SURVEY, 2023

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BACKGROUND AND OBJECTIVES
Vitamin A deficiency (VAD) is a significant public health concern, particularly in low- and middle-income countries. It is the leading preventable cause of childhood blindness and a major factor influencing the overall health, growth, and survival of children. Insufficient levels of Vitamin A adversely affect growth and development, leading to stunting and other long-term health and developmental challenges (1). This study aimed to determine the prevalence of Vitamin A deficiency among Mongolian children aged 6-59 months, as well as the risk factors associated with that prevalence.
METHODS
The Sixth National Nutrition Survey, conducted in 2023, was a cross-sectional study encompassing all 21 provinces and 8 districts of Ulaanbaatar, Mongolia. A two-stage cluster sampling approach was employed, with households containing at least one child under the age of five serving as the random sampling unit. A total of 1,271 children aged 6–59 months participated in the blood test analysis. Serum retinol levels below 0.7 µmol/L were used to define Vitamin A deficiency. Data were analyzed using descriptive statistics and logistic regression models.
RESULTS
The prevalence of Vitamin A deficiency was 7.1%, and insufficiency was 57.9%. Children aged 6–23 months had a significantly higher risk of Vitamin A deficiency compared to those aged 24–59 months (AOR 1.704). Male children (AOR 1.813) and children from minor ethnic groups (AOR 1.752) were also more susceptible. Furthermore, Vitamin A deficiency was associated with an elevated risk of cough (AOR 1.657). Children who had not received high-dose Vitamin A supplementation were at an increased risk of deficiency (OR 1.704). Compared to global prevalence (19.53%) of under-five Vitamin A deficiency in 2019, Mongolian children had lower prevalence (7.1%).2 Specifically, the prevalence was notably lower than low socio-demographic index (SDI) regions (29.67%) and comparable to high-middle SDI regions (5.17%).
CONCLUSIONS
According to Mongolia's Fifth National Nutrition Survey (2017), the prevalence of Vitamin A deficiency was 9.3%, and insufficiency was 61.9%. These figures have decreased in subsequent surveys, likely due to the implementation of the nationwide high-dose Vitamin A supplementation program since 2013.3 Evaluating the accessibility and coverage of national Vitamin A supplementation distribution, as well as assessing the actual intake by children, is necessary to ensure the effectiveness of the intervention.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_667

USE OF LINEAR PROGRAMMING FOR OPTIMIZING THE FOOD BASKET TO IMPROVE THE MICRONUTRIENT INTAKE OF CHILDREN AGED 6 TO 59 MONTHS IN THE NIAYES AGRO-ECOLOGICAL ZONE IN SENEGAL

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BACKGROUND AND OBJECTIVES
Micronutrient deficiencies are a public health problem worldwide. In Senegal, children are especially affected particularly in rural setting. Household diets are often insufficient to cover children's daily nutrient requirements. The aim of this study was to assess the adequacy of micronutrient intakes among children 6-59 months and use linear programming to develop a food basket low cost and nutritionally adequate for these children in the Niayes agro-ecological area.
METHODS
A cross-sectional study targeting 15 children aged 6-59 months randomly selected from the Niayes household was conducted. All foods consumed (morning to bedtime) by the child were weighed using a precision food scale. The composition of mixed dishes was recorded and the ingredients weighed before and after cooking. The quantities of food consumed were obtained by multiplying the weight of a standard handful/spoon (with all the ingredients usually consumed by the child) by the total number of handfuls/spoons ingested. Food intakes were estimated on a raw weight basis and nutrient intakes were determined using the West African food composition table FAO/INFOODS. Micronutrient intake adequacy (MIA) was assessed based on FAO/WHO and Institute Of Medicine reference standards. Foods available were listed from different food retailers. Between 1 to 3 different prices (per kilogram or liter) were collected for each food (99 items), and the average price was used to create the food basket. Linear programming method was used to optimize food basket.
RESULTS
The household diet covers more than 50% energy and protein, 50% iron and 100% vitamin A requirements of the children 6-59 months. While daily median intakes of calcium, zinc and vitamin B9 were lower than the Recommended Dietary Allowances and cover only around 30% of these micronutrients requirements. The optimized food basket was composed of 11 items and costs 359 XOF (~0.59 USD). It covers 100% of energy (1491 kcal) and 100% of calcium (500 mg) requirements and more than 150% of protein (281 g), iron (8 mg) and zinc (6 mg) daily requirements.
CONCLUSIONS
Inadequacy of several nutrients intakes were apparent among Niayes households. Linear programming can provide guidelines for promoting affordable, healthy, and sustainable diets. In addition, the integration of community-based nutrition interventions targeting dietary diversification and nutrition-related knowledge and attitudes is essential for improving complementary feeding practices among 6-59 months.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO5_668

IMPACT OF MULTIMODE SYSTEMIC PRE-CONCEPTION NUTRITION EDUCATION ON IMPROVING DIETARY INTAKE AND NUTRIENT STATUS IN WOMEN UNDERGOING FERTILITY TREATMENT AT A TERTIARY CARE CENTRE

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BACKGROUND AND OBJECTIVES
Developmental biology research and epidemiological evidence indicate that improving women's nutritional status before pregnancy benefits both maternal and infant health I Women undergoing fertility treatment often experience nutritional inadequacies, despite the fact that they are always in prenatal state,increasing the risk of adverse pregnancy outcomes. Present study aims to evaluate the impact of multimode systemic pre-conception nutrition education interventions on food group and nutrient intake.
METHODS
A quasi-experimental study was conducted with 100 women undergoing fertility treatment at a Fertility Centre, randomly divided into control (n=50) and experimental (n=50) groups. Dietary intake was assessed using 24-hour recall and a 3-day food record. Over five months, the experimental group received multi mode systemic pre-conception nutrition education, through booklets, nutrition sessions, diet displays, personal counseling, tailored diet palns and reviews, while the control group followed routine hospital care.
RESULTS
: Significant improvements were observed in the experimental group following nutritional intervention when compared to control group. Using 24 hrs recall method, the intake of all 9 food groups was increased in experimental group while in control group the intake of only 6 food groups was increased and intake of 3 food groups was decreased, intake of 23 nutrients was increased in experimental group and only 1 nutrient intake was decreased while in the control group increase in intake of only 10 nutrients was observed, decrease in intake of 12 nutrients was seen and similar intake was observed in 2 nutrients. Using 3 day food record, the experimental group saw an increase in intake 8 food groups except fats and oils whose intake was reduced while in control group only 5 food groups were increased and 4 food groups were decreased, in experimental group increase in intake of all 23 nutrients and only a nutrient was decreased as compared to control group where only 7 nutrients were increased and 11 nutrients were decreased while no change was observed in intake of 6 nutrients.
CONCLUSIONS
The findings indicate that pre-conception nutritional intervention executed using nutrition booklets, nutrition sessions, diet display, diet counselling and diet reviews significantly improved both food group and nutrient intake Such systemic interventions during the preconception and prenatal phases can help address nutritional deficiencies and support better health outcomes having trans generational impact.
CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6 - Non communicable diseases

EPO6_004

RELATIONSHIP BETWEEN ALTERATIONS IN BODY IRON STATUS AND NUTRIENT INTAKE IN FEMALE FOOTBALLERS WITH IRON DEFICIENCY

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BACKGROUND AND OBJECTIVES
Iron deficiency (ID) is a long-standing health issue in athletes, affecting performance and health. Studies on dietary measures for ID in female athletes recommended adequate energy, protein, and iron intake. Most of these studies focused on aesthetic and endurance athletes, with few involving other athletes. Dietary approaches to ID may differ based on athletic characteristics. This study assessed the relationship between alterations in body iron status and nutrient intake in female football players with ID.

METHODS
The study involved 36 Japanese amateur football players (mean±standard error; age: 23.4±2.8 years; years of athletics: 16.3±2.7; and body mass index: 21.3±2.0 kg/m^2), who volunteered from 2022 to 2024. Each year, body composition, dietary surveys, and haematological parameters were measured in March before the league started and in July during the league. The dietary survey used was a brief, self-administered diet history questionnaire. In March, the subjects were divided into two groups: ID group (n = 12) and normal (N) group (n = 24). Their nutrient intakes were compared. Alterations over a 4-month period were calculated, and the relationship between ferritin levels and nutrient intake was examined in the ID and N groups. The presence of ID was defined as either a haemoglobin level < 12 g/dL or a ferritin level < 35 ng/mL.

RESULTS
Twelve participants (33 %) had ID before the start of the league. Of these, six (17 %) had returned to the normal range of body iron status after 4 months. There were no significant differences in energy, protein, or iron intake between the two groups before the league began. No significant correlation was observed between ferritin levels and nutrient intake in terms of alterations over the 4-month period. However, in the ID group, a trend was observed between alterations in ferritin levels and protein intake (r = 0.556, p = 0.055). A comparison of nutrient intake in the ID group that was subdivided into six participants whose body iron status recovered after four months (ID-N group) and six participants who remained ID (ID-ID group), revealed that the alterations in protein intake were significantly higher in the ID-N group than that in the ID-ID group (0.31 g/kg BW vs. -0.145 g/kg BW, p = 0.015). No significant differences in alterations in iron intake were observed between the two groups.

CONCLUSIONS
The increased protein intake is likely associated with the restoration of body iron status in female footballers with ID.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_005

OBSERVATION OF DIURNAL VARIATION IN SALT EXCRETION USING A SALT EXCRETION SELF-MEASURING DEVICE

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BACKGROUND AND OBJECTIVES
We have developed a salt excretion self-measuring device (hereafter referred to as “salt monitor”) and have reported that it can assess salt excretion over 24 hours, similar to the conventional urine storage method. This device can measure the urine volume and salt excretion during urination in a short time. In this study, we attempted to use this method to determine diurnal variations in urinary salt excretion.

METHODS
Data from a salt monitoring validation study involving 20 healthy Japanese female volunteers were analyzed in detail. Participants measured and recorded urinary salt excretion, urine volume, and urinary time over 24 hours from the second urination after waking up on the measurement day to the first urination the next morning on eight non-consecutive days. Salt concentration (mmol/L) was calculated based on the amount of salt excreted and urine volume. In addition, to account for the urinary interval, salt excretion per hour (g/h) was calculated by dividing the amount of salt excreted during urination by the time elapsed since the previous urination. Observations of these indices focused on 1) all urination points hourly and 2) four points of urination for each participant: the second urine after arising, third urine after arising, final urination before bedtime, and first urine the next morning (nighttime urine). The study protocol was approved by the Ethics Committee of the Jissen Women’s University (approval no. H2021-05).

RESULTS
A total of 875 urinary data points for 157 days were analyzed. The 20 participants had a mean frequency of urination of 5.6 ± 1.6 times, a mean daily urine output of 1,201 ± 365 mL, and a mean salt excretion of 7.0 ± 1.8 g. The mean urine output per urination was 247 ± 54 mL, salt excretion was 1.38 ± 0.42 g, and salt concentration was 101 ± 28 mmol/L. The mean urine volume and salt excretion for all urine samples peaked early in the morning, whereas salt excretion per hour of urine storage (g/h) was higher in the early afternoon. The same trend was observed at the four main measurement points, with higher salt excretion (g/h) in the third urine samples after arising.

CONCLUSIONS
Diurnal variation in salt excretion could be observed by combining the urinary data obtained using the new salt monitor with the recording of the time of urination. In the study participants, urinary salt excretion in a single urination session was highest in the early morning and, when urinary storage elapsed time was considered, in the early afternoon. The salt monitor is expected to be useful for observing an individual's salt excretion rhythm.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_009

DESIGN AND VALIDATION OF DRUG DELIVERY SYSTEM INCORPORATING GYMNEMA SYLVESTRE FOR DIABETES MELLITES

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BACKGROUND AND OBJECTIVES

Diabetes mellitus is a global health challenge requiring innovative therapeutic strategies to improve glycemic control and enhance patient compliance. This study aims to develop and evaluate a novel drug delivery system that integrates the antidiabetic properties of *Gymnema sylvestre* with the functional benefits of resistant starch extracted from barnyard millet.

METHODS

Gymnema sylvestre leaves were processed into aqueous extracts, and their antidiabetic and functional properties were analyzed. Resistant starch type 3 (RS3) was enzymatically extracted from barnyard millet, and its amylose content and functional properties were evaluated. Films and capsules containing RS3 and *Gymnema sylvestre* extract were fabricated using casting and dipping methods, followed by controlled drying. In silico studies examined interactions between gymnemic acid and sweet taste receptors (T1R2, T1R3) and diabetes-related proteins (INSR, IRS, PI3K, GLUT-4, AMPK). The release profile of gymnemic acid was assessed using simulated gastrointestinal fluids (SGF and SIF) to mimic physiological conditions.

RESULTS

Aqueous extracts of *Gymnema sylvestre* leaves showed potent antidiabetic activity, inhibiting alpha-glucosidase (IC50=55.35±1.22) and alpha-amylase (IC50=53.9±3.15), helping reduce postprandial glucose spikes. Proximate analysis revealed nutritional content, including 9.94% protein, 10.7% fiber, 752 mg calcium, antioxidant activity (57.1±2.17%) and phenols (18.9±1.93mg/g). FTIR and XRD confirmed key functional groups in resistant starch from barnyard millet, while FESEM showed structural modifications. In silico studies highlighted strong interactions between gymnemic acid and sweet taste receptors and key proteins. Gymnemic acid released in SGF(pH 1.2) was minimal (10%) at 1 hour, but in SIF(pH 6.8) the cumulative release reached 80% after 4 hours. Sensory analysis indicated a significant reduction in sweetness perception from 8.2 ± 0.5 to 2.1 ± 0.3 after exposure to the Gymnema-based film.

CONCLUSIONS

This study lays the foundation for using *Gymnema sylvestre* and resistant starch in novel drug delivery systems. The dual-action approach, combining targeted intestinal release via capsules and taste receptor modulation through films, offers a promising strategy to improve glycemic control and patient compliance.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_011

DIETARY POLYPHENOL INTAKE AND RISK OF OVERALL AND SITE-SPECIFIC CANCERS: THE JAPAN PUBLIC HEALTH CENTER-BASED PROSPECTIVE STUDY

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BACKGROUND AND OBJECTIVES
Polyphenols may play a protective role in carcinogenesis through a wide range of properties, including antioxidant and anti-inflammatory. Although several studies have investigated the association between polyphenol intake and cancer risk in Western populations, there is limited evidence in Asian populations, where different food sources of polyphenols, such as soy and green tea, are consumed. This population-based prospective study aimed to investigate the association between polyphenol intake and risk of overall and site-specific cancers among Japanese.

METHODS
Participants were 42,012 men and 48,337 women aged 45-74 years with no history of cancer diagnosis in the Japan Public Health Center-based (JPHC) Prospective Study. Dietary polyphenol intake was estimated by a 147-item food frequency questionnaire administered in 1995-1998. Participants were divided into quintiles (Q) according to intakes of total polyphenol and polyphenol from foods without high-polyphenolic beverages (tea, coffee, and alcoholic beverages). Hazard ratios (HRs) and 95% confidence intervals (CIs) for cancer risk were estimated using Cox proportional hazard regression models adjusted for potential confounders.

RESULTS
During a median of 15.8 years of follow-up, 16,319 incident cancer cases (9,960 men and 6,359 women) were identified. We did not observe associations of lower risk of overall cancer with polyphenol intake. For site-specific cancers, as compared with the lowest quintile (Q1), higher total polyphenol intake was associated with a lower risk of liver cancer in men (HR for Q5=0.62, 95% CI=0.46-0.84, p-trend<0.001) and women (HR for Q5=0.59, 95% CI=0.37-0.95, p-trend=0.002), while higher polyphenol intake from foods without tea, coffee and alcoholic beverages was associated with a lower risk of colon cancer in men (HR for Q5=0.71, 95% CI=0.54-0.94, p-trend=0.04).

CONCLUSIONS
The RESULTS of the present study do not support a substantial role for dietary polyphenols in overall cancer prevention. Total polyphenol may reduce the risk of liver cancer, and polyphenol intake from foods without tea, coffee, and alcoholic beverages may reduce the risk of colon cancer.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_014

ASSOCIATIONS BETWEEN DIETARY PATTERNS AND PSORIASIS RISK: A PROSPECTIVE COHORT STUDY FROM THE UK BIOBANK

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BACKGROUND AND OBJECTIVES
Psoriasis is an inflammatory skin disease, presenting as elevated and red cutaneous lesions, adversely impacting people's quality of life. Given the link between diet and inflammation and the unclear role of diet quality in the onset of psoriasis (1), this study used the large-scale UK Biobank to explore the association between dietary patterns and psoriasis incidence (2).

METHODS
The study included UK Biobank participants who were initially free of psoriasis and followed for an average of 14 years. Participants in this analysis were free from chronic inflammatory infectious disease (HIV and chronic viral hepatitis) and had completed at least two 24-hour dietary recalls. Nine diet quality indices were computed, including the Low Carbohydrate Diet Score (LCDS), Alternative Mediterranean Diet (aMed) Score, Eatwell Score, Alternative Binary Eatwell Score, Alternative Graded Eatwell Score, Healthy Diet Index (HDI), Alternative Healthy Eating Index (aHEI), Dietary Approaches to Stop Hypertension Score (DASH), Dietary Inflammatory Index (DII), and Plant-Based Diet Index (PDI) to account for the known link between alcohol and psoriasis risk (3). The primary outcome of this study was the incidence of psoriasis, determined through self-reported diagnosis, primary care records, and hospital admission data.

RESULTS
Among the 121,584 participants, 1,073 developed psoriasis, yielding an incidence rate of 0.88%. The mean age (SD) was 56.2 (7.8) years, with 54.8% (n = 60,341) being female, and the majority of participants (96.8%) identifying as White. In the multivariable model adjusted for age, sex, Townsend deprivation index, SES, physical activity, smoking, alcohol use, supplement intake, comorbidities, and BMI (Model 2), higher PDI scores (range: 18–90), specifically within the highest quartile (Q4: 58–80), were associated with an 18% reduced risk of incident psoriasis (HR: 0.82, 95% CI: 0.67–1.00, P = 0.045) compared to the lowest quartile (Q1: 29–51). Each 1-point increase in PDI was linked to a 2% lower psoriasis risk (HR: 0.98, 95% CI: 0.97–1.00, *P* = 0.008). Other diet quality indices were not associated with psoriasis incidence.

CONCLUSIONS
In this large cohort, greater adherence to the PDI was associated with lower risk of psoriasis, suggesting the potential benefits of plant-based diets in reducing psoriasis risk. Future research should prioritize randomized controlled trials to confirm this relationship.

CONFLICTS OF INTERESTS
TM has received honoraria from Abbvie, Almirall, Amgen, Galderma, Pfizer, Novartis, UCB Pharma, L'Oreal and Proctor & Gamble.WLH has received research funding from the Alliance for Potato Research & Education and the Almond Board of California, as well as consultancy fees from ZOE Ltd, and funding to attend a conference from Yakult UK Ltd.

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EPO6_020

UNHEALTHY EATING BEHAVIOR AFFECTING DYSLIPIDEMIA OF FAMILY CHEFS: AN EMPIRICAL STUDY IN BEIJING, CHINA

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BACKGROUND AND OBJECTIVES
This research aims to investigate the relationship between unhealthy eating behavior and dyslipidemia in family chefs and to provide the scientific basis for formulating and implementing relevant behavioral interventions.

METHODS
A cross-sectional study was conducted in Beijing from May to November 2023.Demographic characteristics,the prevalence of dyslipidemia and bad eating behaviors were collected through a self-reported questionnaire.Multivariate unconditional logistic regression wasused to analyze the impact of poor dietary behavior by family chefs on blood lipid abnormalities.

RESULTS
A total of 1037 family chefs were included,of which 237 reported dyslipidemia,the prevalence rate was 22.9%.Moreover,after adjusting for gender, region, education level, age, overweight and obesity, hypertension, diabetes, and concern about nutrition and health, the participants wish to understand the dietary Guidelines for hyperlipidemia.The RESULTS of multivariate Logistic regression analysis indicated that the risk of dyslipidemia of family chefs with overeating behavior was less (*OR*=0.533,95%*CI*:0.301-0.945),eating more meat (*OR*=1.529,95%*CI*:1.031-2.267), eating less aquatic products (*OR*=1.683,95% *CI*:1.206-2.348),eating less vegetables (*OR*=1.676,95%*CI*:1.099-2.557).The risk of dyslipidemia was higher in family chefs with a high salt diet (*OR*=2.871,95% *CI*:1.924-4.284), with statistical significance (*P*<0.05).

CONCLUSIONS
Unhealthy eating behaviors of family chefs are common.Specifically, the behavior of eating more meat, less aquatic products, less vegetables, and a high salt diet can affect the incidence of dyslipidemia, hence targeted behavioral intervention should be carried out.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_021

UNDERSTANDING THE RELATIONSHIP BETWEEN DIETARY NUTRIENTS AND METABOLIC SYNDROME: A NEW PERSPECTIVE FROM NETWORK ANALYSIS

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BACKGROUND AND OBJECTIVES
Metabolic syndrome (Mets) is a major public health challenge, closely linked to dietary energy intake, eating behaviors, and nutrient composition. Traditional linear models, which assume independence of effects, are suboptimal due to the interdependent nature of nutrient consumption. The associations between Mets and individual nutrient remain underexplored.

METHODS
We employed data from the China Nutrition and Health Surveillance (CNHS), a national survey on nutrition and chronic diseases. A semiparametric Gaussian copula model was used to estimate nutrient interactions related to metabolic syndrome across three cross-sectional datasets from Beijing.

RESULTS
A total of 4062 individuals were included (1185 in 2010; 1648 in 2015; and 1229 in 2022), with 1360 diagnosed with Mets. The median age-sex-race-specific metabolic syndrome score was 0.36, and the median total energy intake was 1924 kcal. Strong associations were observed between various nutrients and metabolic syndrome indicators, with over 70% non-zero edges in each network. Non-parametric and case-drop bootstrapping tests confirmed the stability and accuracy of these networks, with a correlation stability coefficient above 0.75. 'Energy' was the most central nutrient with a node Expected Influence Index of 1.59, 1.68, and 1.77 in 2010, 2015, and 2022 waves, respectively, followed by ash, riboflavin, protein, and minerals such as potassium and phosphorus.

CONCLUSIONS
Our findings suggested that energy restricting and balanced supplementation of riboflavin and minerals are important for managing metabolic syndrome.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_022

ASSOCIATION BETWEEN BEVERAGE INTAKE AND THE INCIDENCE OF GASTROESOPHAGEAL REFLUX DISEASE: THE KOREAN NURSES' HEALTH STUDY

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BACKGROUND AND OBJECTIVES
Gastroesophageal reflux disease (GERD) is a common clinical condition characterized by heartburn or regurgitation. High intakes of acidic beverages, such as coffee, green tea, soda, or juice, have been suggested to be associated with the risk of GERD, whereas dairy intake may reduce the risk. However, prospective studies to confirm these associations are limited. This study aimed to investigate the associations of coffee, green tea, soda, juice, milk, soy milk, and yogurt drinks intakes with GERD incidence using data from the Korea Nurses' Health Study (KNHS).

METHODS
The KNHS included 8,086 women aged 21-50 years who completed a web-based food frequency questionnaire (FFQ) between 2014 and 2019. The participants were followed up through subsequent surveys, which continued until the 11th phase. Intakes of coffee, green tea, soda, juice, milk, soy milk, and yogurt drinks (g/day) were categorized into non-drinkers and quintiles. GERD was defined as a self-reported physician diagnosis. Cox proportional hazards regression model was used to estimate relative risks (RRs) and 95% confidence intervals (CIs).

RESULTS
During a mean follow-up of 5.4 person-years, we identified 1,406 women who reported a diagnosis of GERD. In the multivariable models, we found no associations of coffee, green tea, soda, juice, milk, soy milk, and yogurt drinks intakes with GERD risk. The RRs (95% CIs) for the top quintile of beverage intake compared to non-drinkers were: 0.82 (0.66-1.01) for coffee (*P* for trend = 0.22), 1.12 (0.93-1.34) for green tea (*P* for trend = 0.16), 0.93 (0.74-1.17) for soda (*P* for trend = 0.71), 1.07 (0.84-1.35) for juice (*P* for trend = 0.56), 1.06 (0.87-1.29) for milk (*P* for trend = 0.59), 0.89 (0.74-1.08) for soy milk (*P* for trend = 0.43), and 1.00 (0.84-1.20) for yogurt drinks (*P* for trend = 0.81). In a sensitivity analysis, we included 6,462 participants who completed at least one survey from phases 8 to 11. The associations remained non-significant.

CONCLUSIONS
Intakes of coffee, green tea, soda, juice, milk, soy milk, and yogurt drinks were not associated with the incidence of GERD among Korean women.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_025

EVALUATING ANIMAL MODELS FOR DIABETIC MYOPATHY: COMPARISON OF SKELETAL MUSCLE FUNCTIONS IN TWO DIFFERENT STREPTOZOTOCIN-INDUCED DIABETIC MODELS

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BACKGROUND AND OBJECTIVES
Diabetes is a major cause of mortality globally, and one of the common complications in diabetes is impaired muscle function, also known as diabetic myopathy. Despite being a common complication, the pathophysiology of diabetic myopathy remains unclear. Streptozotocin (STZ) is a commonly used agent to induce diabetes in animal models. Owing to the nonspecific cytotoxicity at high doses, alternative models employing moderate doses or combining low doses of STZ with a high-fat diet (HFD) have been established. Both models are used arbitrarily to study diabetic complications. However, the outcomes of these models on skeletal muscle function are unknown. Thus, this study aimed to investigate the effects of these models on muscle function.

METHODS
Either moderate-dose STZ (100 mg/kg, twice) or a combination of low-dose STZ and high-fat diet (50 mg/kg for 5 consecutive days + 45% high-fat diet) were used to induce diabetic state in mice, and skeletal muscle functions were examined using in vivo electrical stimulation. Biochemical and gene expression analysis were conducted on the skeletal muscles immediately after the stimulation.

RESULTS
Both models yield similar RESULTS in the contractile force compared to respective controls. However, moderate-dose STZ mode showed a more severe fatigue and blunted exercise-induced glycogen degradation. Gene expressions analysis reveals that the distinct fatigability phenotype of moderate-dose STZ is possibly attributed to downregulations of oxidative phosphorylation- and vascularization-related genes.

CONCLUSIONS
This study provides valuable considerations for the selection of suitable STZ models in diabetic myopathy research, especially for the development of treatment using nutrition and food factors to improve skeletal muscle function in diabetes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_027

STUDY OF DIETARY PRACTICES AND LIFESTYLE OF THE SUB-SAHARAN POPULATION IN MOROCCO: DESCRIPTIVE CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
Migration often leads to changes in diet, physical activity, and exposure to certain risk factors, which can contribute to the development of non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases. This study aims to examine the dietary habits, lifestyle, and risk factors for NCDs among sub-Saharan migrants in Morocco.

METHODS
We carried out an analytical cross sectional survey in the city ofCasablanca in Morocco from January 2023 to January 2024. Altogether 272 migrants from the Africa sub-Saharan meet the inclusion criteria and agree to participate. We used astandardized questionnaire with the following headings: socio-demographic characteristics,dietary knowledge and practices, lifestyle and anthropometric measurements.

RESULTS
The study involved 272 participants, with 48.97% men and 51.03% women, and an average age of 25.4 ± 6.6 years. The majority were single (82%) and had a university degree (95.6%). Regarding the length of stay, 58.39% had been in Morocco for 6 months to 4 years, while 41.61% had been there for more than 4 years. In terms of dietary habits, only 27.6% followed the WHO recommendations for vegetable intake (400g per day), and 26.5% followed the recommendations for fruit intake. 33.8% consumed one serving of cereals per day, and 32.4% consumed more than one serving, while 33.8% consumed fewer than 5 servings of cereals per week. More than half (53.7%) ate dairy products daily, but 27.9% consumed fewer than 5 servings per week. Regarding protein sources, 64% primarily consumed poultry, eggs, and fish, while 15.4% mostly ate red meat, and 20.6% obtained protein from vegetables and legumes.Regarding meal frequency, 22.1% reported never or rarely having 3 meals per day, and 55.1% did so occasionally, while 22.8% consistently had 3 meals per day. The analysis revealed an association between the frequency of consumption of dairy products, vegetables, fruits, and cereals, and the number of years spent in Morocco. Regarding lifestyle, 83.3% were non-smokers, 72.2% did not consume alcohol, 23.9% did not engage in any physical activity, 52.2% engaged in light physical activity, and 23.9% participated in vigorous physical activity.

CONCLUSIONS
The association between the frequency of fruit, vegetable, and cereal consumption and the length of stay in Morocco reflects the impact of migration on the dietary habits of this sub-Saharan population. Overall, this population has a diet low in fruits, vegetables, and cereals according to WHO recommendations, which makes them vulnerable to infectious diseases, nutrient deficiencies, and non-communicable diseases in the long term.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_030

CIRCULATING 25-HYDROXYVITAMIN D CONCENTRATION, VITAMIN D-RELATED GENE POLYMORPHISMS, AND MORTALITY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF PROSPECTIVE STUDIES

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BACKGROUND AND OBJECTIVES
Previous studies have suggested an inverse association between circulating 25-hydroxyvitamin D (25[OH]D) concentration and mortality, but RESULTS among Asians remain inconsistent. The association of individual vitamin D-related genetic polymorphisms, as well as their combined effects, with mortality is unclear. This study aimed to summarize and quantify the evidence on these associations.

METHODS
A systematic search of PubMed and Web of Science was conducted through September 2024. Prospective studies from the general population reporting relative risks (RRs) and 95% confidence intervals (CIs) were included. A random-effects model was used to calculate pooled RRs.

RESULTS
A total of 62 prospective studies comprising 1,531,216 participants and 111,294 deaths were included in the meta-analysis: 54 (9 from Asia) on all-cause mortality, 20 (5) on cancer mortality, 31 (3) on cardiovascular disease (CVD) mortality, and 6 (0) on respiratory disease (RD) mortality. In the categorical analysis, the lowest 25(OH)D concentration group had significantly higher risks of all-cause and cause-specific mortality compared to the highest group. The findings remained consistent when analyses were restricted to Asian populations; pooled RRs (95% CIs) were 1.18 (1.10–1.26) for all-cause, 1.25 (1.11–1.40) for cancer, and 1.17 (1.06–1.30) for CVD mortality. In the continuous analysis, a 25 nmol/L decrease in 25(OH)D concentration was associated with a 6% higher risk for all-cause, cancer, and CVD mortality and a 15% higher risk for RD mortality. Only one study from China examined the continuous association with all-cause mortality, reporting an inverse association. Additionally, seven studies assessed the association between vitamin D pathway genetic polymorphisms and mortality, but due to the limited number of studies, a meta-analysis could not be performed. No studies were conducted among Asian populations.

CONCLUSIONS
Circulating 25(OH)D concentrations are inversely associated with all-cause and cause-specific mortality, including among Asian populations. Evidence on vitamin D-related genetic polymorphisms and mortality remains limited, highlighting the need for further research. We also plan to update this meta-analysis with findings from our study in the Japanese population.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_031

HOW DO PLANT BASED MEAT ANALOGUES AND VEGETARIAN DIETARY PATTERNS COMPARE WITH RED-MEAT CONTAINING DIETS?

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BACKGROUND AND OBJECTIVES
A flexitarian diet primarily focuses on plant-based foods but allows for occasional consumption of meat or animal products. In contrast, a vegetarian diet excludes all meat and fish but may still include dairy and eggs, along with meat alternatives. A newer type of meat alternative on the market are plant-based meat analogues (PBMAs) which can be included in both vegetarian and flexitarian diets. Research by Braakhuis and colleagues have explored the impact of individual meat, PBMAs, flexitarian and vegetarian diets on digestion and health. We will also present data on dietary adherence.

METHODS
The methodology covers two key randomised controlled trials and details can be sourced via clinical trial registrations:1) Acute red meat and meat analogue mixed meal challenges 2) red meat versus vegetarian diet intervention in young adults: Clinicaltrials.gov registration NCT4545398 & NCT04869163

RESULTS
Both vegetarian and flexitarian dietary patterns were no different regarding health markers after 10 weeks. PBMAs have a lower protein absorption response and different lipidomic and fatty acid absorption profile to red meat. Participants did struggle to adhere to a vegetarian diet, when compared to the flexitarian diet, despite an interest in changing habits.

CONCLUSIONS
There was no superiority when comparing vegetarian and flexitarian diets on health. However, PBMAs did not mimic the nutrition profile of red meat. Changing dietary habits is best supported using behaviour change techniques.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_032

FEASIBILITY AND PRELIMINARY EFFECTS OF THE PLANETARY HEALTH DIET ON OBESITY-RELATED OUTCOMES: A PILOT RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
Observational studies reported the associations between planetary health diet (PHD) and health-related outcomes, but randomized controlled trials (RCTs) are lacking. This first pilot RCT assessed the feasibility of implementing the PHD and explored effects on health-related outcomes.Observational studies reported the associations between planetary health diet (PHD) and health-related outcomes, but randomized controlled trials (RCTs) are lacking. This first pilot RCT assessed the feasibility of implementing the PHD and explored effects on health-related outcomes.

METHODS
A total of 24 participants aged 18+ years were enrolled and randomly allocated (1:1) to either the intervention (PHD for eight weeks) or a control group (conventional diet). Data were collected at baseline and post-intervention, with anthropometric parameters assessed biweekly. The primary aim was on the feasibility of trial procedures. Secondary outcomes included anthropometric, biochemical and gut microbiome indicators. The trial was registered at ClinicalTrials.gov (ChiCTR2400083254).

RESULTS
The intention-to-treat (ITT) analysis included 24 participants while per-protocol (PP) analysis included 23 participants (1 in control group dropout). Feasibility outcomes demonstrated successful implementation, with 60% recruitment, 95% retention, high adherence and low difficulty to the PHD intervention. Preliminary exploratory analysis indicated greater reductions in body fat mass (adjusted β (95% confidence interval (CI)) in ITT: -1.25 (-2.41, -0.10) kg), waist circumference (adjusted β (95% CI): -2.58 (-4.67, -0.49) cm), waist-to-height ratio (adjusted β (95% CI): -0.02 (-0.03, -0.01)), and body roundness index (adjusted β (95% CI): -0.26 (-0.46, -0.05)). PP analysis showed similar RESULTS. No significant differences were observed for biochemical or gut microbiome indicators.

CONCLUSIONS
The PHD intervention was feasible in recruitment, retention and adherence. PHD showed potential benefits for obesity-related outcomes, but larger, fully powered RCTs are needed to assess the definitive effects of PHD on biochemical and gut microbiome indicators.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_033

EXPLORING THE GAP BETWEEN KNOWLEDGE AND PRACTICE IN ADOLESCENT BEVERAGE CHOICES

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BACKGROUND AND OBJECTIVES
Adolescence is a critical period for developing lifelong dietary habits, yet the increasing availability and consumption of sugar-sweetened beverages (SSBs) pose significant health risks. Understanding knowledge, attitude, and adolescents' actual consumption behaviors can provide valuable insights for targeted public health interventions and policies.

METHODS
Four small Focus Group Discussions (FGDs) were conducted with two groups of junior and two groups of senior high school students in November 2024, involving 20 students. The schools were purposively selected, and each FGD lasted approximately 1.5 hours.

RESULTS
Some adolescents were aware of nutrition labels in packaged beverages and recognized the 'healthier choice' logo. Although the 'nutri-level' labelling is not regulated yet, they recognized it as well from other country through TikTok. None of the adolescents could identify the maximum recommended daily intake of sugar, salt, and fat, as their judgments were based on subjective perceptions. They acknowledged food safety concerns and the impact of overconsumption of high sugar, salt, and fat, such as obesity, diabetes, and high cholesterol through real-life experiences of family members. Healthy drinks were perceived as more expensive and less accessible. The three major considerations of students in purchasing beverages are the price, taste, and its visual. Despite understanding the need to reduce sugar content in drinks, they continued to consume the over-sweetened beverages if it is already purchased. The main source of sugar-sweetened beverages was from the school canteens, due to their long hours in school.

CONCLUSIONS
This study highlights the gap between knowledge and practice among adolescents, underscoring the need for improved education and accessible healthy options. It is essential to implement nutrition education in schools and utilize targeted marketing strategies, including social media campaigns featuring influencers. Increasing the availability and affordability of healthy drinks, offering promotional discounts, and incentivizing retailers to stock nutritious options are crucial. Community engagement, parental involvement, and government policies further reinforce these efforts.

CONFLICTS OF INTERESTS
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EPO6_034

REAL-WORLD SETMELANOTIDE HUNGER AND WEIGHT OUTCOMES IN PATIENTS WITH ACQUIRED HYPOTHALAMIC OBESITY

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BACKGROUND AND OBJECTIVES
Acquired Hypothalamic obesity (HO) is caused by physical, tumor and/or treatment-related damage or developmental abnormalities to the hypothalamus which can lead to impaired melanocortin-4 receptor (MC4R) pathway signaling, and is characterized by excessive and often rapid weight gain following the injury. Here, we report real-world experiences of adult patients with acquired HO with a minimum of 3 months of setmelanotide treatment in France under pre-marketing early access authorization.

METHODS
Patients with acquired HO, aged ≥18 years, were treated with setmelanotide in 5 different hospitals in France. This analysis reports hunger scores, weight-related outcomes and adverse events.

RESULTS
Eight patients, 50% male, with a previous resection for craniopharyngioma (n=7) or rathke cleft cyst (n=1) were included. A BMI decrease of 5.6% (2.3 kg/m2), 12.8% (5.7 kg/m2) and 21.3% (9.9 kg/m2) after 1-month, 3-months and 6-months (n=5) of treatment, respectively, was observed, corresponding with a mean decrease in weight of 6.9 kg, 16.8 kg and 29.0 kg, respectively. Patients achieved a ≥5% and ≥12% reduction in weight at 3 months and 6 months, respectively. Hunger scores were reduced for all patients. During treatment, patients reported injection-site pruritus, asthenia, frequent non-prolonged erections, headache, hyperpigmentation, nausea, anorexia, bacterial angina, bloating, decreased morning erections, diarrhea, erythema, flatulence, increased depressive syndrome, unilateral testicular pain.

CONCLUSIONS
This real-world data of 8 patients with acquired hypothalamic obesity who received ≥3 months of setmelanotide under pre-marketing early access authorization showed consistent improvements in hunger scores and weight outcomes with no new safety signals.

CONFLICTS OF INTERESTS
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EPO6_035

ASSOCIATION BETWEEN MEAL DURATION AND GASTROESOPHAGEAL REFLUX DISEASE AMONG KOREAN WOMEN: THE KOREA NURSES' HEALTH STUDY

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BACKGROUND AND OBJECTIVES
Gastroesophageal reflux disease (GERD) is a common chronic condition where stomach contents flow back into the esophagus, causing heartburn and regurgitation. The evidence of the association between meal duration and GERD remains limited, especially from longitudinal cohort studies. This study aims to investigate the association between meal duration and GERD risk in the Korea Nurses' Health Study (KNHS).

METHODS
In the KNHS, a total of 9,423 women aged 21-50 years were included. The participants completed surveys from baseline up to the 12th survey. Meal duration was categorized into five groups; <5 minutes, 5 to <10 minutes, 10 to <15 minutes, 15 to <20 minutes and ≥20 minutes. GERD cases were determined based on self-reported physician diagnosis. Multivariable Cox proportional hazard models were employed to estimate Relative Risks (RRs) and 95% confidence intervals (CIs). Sensitivity analysis included 7,600 participants, including those who participated in at least one survey from the 8th to the 12th surveys.

RESULTS
During a mean follow-up of 5.9 person-years, a total of 1,751 cases of GERD were identified. In the multivariable models, meal duration was inversely associated with GERD risk. Compared to the group with a meal duration of 10 to <15 minutes, RRs (95% CIs) were 1.41 (1.09-1.83) for <5 minutes, 1.13 (1.02-1.26) for 5 to <10 minutes, 1.05 (0.91, 1.20) for 15 to <20 minutes, and 0.74 (0.57-0.96) for ≥20 minutes, (*p* for trend <0.001). In a sensitivity analysis, the association remained similar.

CONCLUSIONS
This study provides the evidence that meal duration is inversely associated with GERD risk among Korean women. These findings underscore the importance of identifying healthy eating behaviors for preventing GERD.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_037

CAN FURAN FATTY ACID SUPPLEMENTATION COUNTERACT MUSCULOSKELETAL DISORDERS AND IMPROVE HEALTHY AGEING?

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BACKGROUND AND OBJECTIVES
Sarcopenia and osteoarthritis are major factors in functional decline, risk of falls, disability and mortality in the elderly. In a global context of ageing populations, particularly in France, the prevalence of these diseases, which affect quality of life, is becoming a major public health issue. The common etiologies of these tissue degenerations are oxidative stress, inflammaging and a reduction in the regenerative capacity of these tissues. *In vitro* studies have shown that furan fatty acids (FuFAs), bioactive lipids found in fish, dairy products, fruits and vegetables, have antioxidant and anti-inflammatory properties. Initial preclinical studies in muscle cells and healthy or obese mice suggest that FuFAs improve insulin sensitivity and increase muscle mass, partly mimicking the effects of exercise.
This study explores the potential benefits of FuFAs supplementation in slowing age-related musculoskeletal disorders, and improving mobility, well-being and longevity in mice.

METHODS
40 male and 40 female C57BL/6J mice aged 16 months were fed their respective diets (standard diet or standard diet enriched with 0.05% FuFA-F2/kg diet) for 6 to 8 months. Their physical performance, behavior and physiological status (lean and fat mass, well-being, motor test, grip strength test, endurance test, behavioral test) were evaluated throughout the study. At the end of the diet, the mice were placed in respiratory metabolic cages to calculate the respiratory exchange ratio (RER). Finally, mice were euthanized and the tissues (muscles and leg joints) were collected for analysis.

RESULTS
Our preliminary RESULTS show that aged male and female mice have a different physiological state. In fact initial body weight and weight gain are lower in female mice and skin disorders (dermatosis) are observed only in females. In addition we observed favourable effect of FuFAs supplementation on the well-being of both male and female mice, with greater weight gain in males (p=0.0001) and females (0.0456) and fewer skin disorders and mortality in females. An improvement of physical performance was also observed in male mice.

CONCLUSIONS
These RESULTS show that chronic supplementation with FuFAs could help to limit age-related decline in musculoskeletal function. FuFAs could be used as a food supplement to promote healthy ageing, contributing to a solution for sarcopenia and osteoarthritis.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_038

FURAN FATTY ACIDS SUPPLEMENTATION IN OBESE MICE REVERSES HEPATIC STEATOSIS AND PROTECTS AGAINST CARTILAGE DEGRADATION

Mathys Chaslin[1]; Georges Maroun[2]; Erwann Durand[3]; Beatrice Bonafos; Said Assou[2]; Laurent Vaysse[4]; Siriluck Liengprayoon[5]; Laurence Pessemesse[1]; Christelle Bertrand-Gaday[1]; Jean-Marc Brondello[2]; Francois Casas[1]; Christine Feillet-Coudray[1]
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BACKGROUND AND OBJECTIVES
Obesity is a major global health problem associated with numerous metabolic dysfunctions, an increased risk of developing Metabolic Associated Steatotic Liver Disease (MASLD) and osteoarthritis. Recently, we demonstrated that a preventive furan fatty acids (FuFA-F2) supplementation, a natural compounds found in many foods, reduced the onset of metabolic disorders. This study aimed to determine whether a short FuFA-F2 supplementation is capable of reversing metabolic disorders and limiting cartilage degradation in already 6-month-old obese C57Bl/6J mice.

METHODS
Ten 6-month-old C57Bl6 mice were fed a control diet all along the study; twenty 6-month-old C57Bl6 mice were fed a high-fat diet (HFHS) for 20 weeks and were fed for a further 4 weeks one of 2 semi-purified diets: HFHS diet or HFHS + FuFA-F2 (0.048% FuFA-F2/kg diet). We monitored the animals longitudinally (weight, body composition, energy expenditure and metabolic test) and then analysed the phenotype of two major tissues involved in energy homeostasis, skeletal muscle and liver. Moreover the whole joint structure of bone (cartilage and synovitis) was assessed.

RESULTS
Liver triglyceride content and histologic analysis revealed that 4 weeks of FuFA-F2 supplementation fully reversed hepatic steatosis in obese mice. Liver RNA-sequencing analysis highlighted that FuFA-F2 partly reversed the gene expression signature induced by the HFHS diet and favorably changed the expression of many genes known to be involved in the development of hepatic steatosis such as *Pcsk9*, *Stard4*, *Insig1* and *Sulf2*. We also found that FuFA-F2 supplementation increased skeletal muscle mass and protected against cartilage degradation and synovitis induced by obesity.

CONCLUSIONS
Our findings showed that FuFA-F2 supplementation in obese mice reversed the development of MASLD, protected against the onset of osteoarthritis and promoted muscle mass. This study highlights that nutritional supplementation with FuFA-F2 could be an effective approach to treat obesity-related disorders.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_039

MEASURES TO PREVENT LIFESTYLE-RELATED DISEASES BY IMPROVING FOOD ENVIRONMENTS OF FRUIT INTAKE FOR UNIVERSITY STUDENTS –ENVIRONMENTAL ANALYSIS BASED ON SOCIAL MARKETING–

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BACKGROUND AND OBJECTIVES

Research using meta-analysis on fruit intake and prevention of NCDs has shown that fruit intake up to 200 g a day reduces the risk of developing hypertension, obesity, and type 2 diabetes. In Japan, the Ministry of Health, Labour and Welfare (Health Japan 21 (the third term), 2024) has established goals aimed at extending healthy life expectancy, including a target of 200g/day for fruit intake. This study surveyed university students on fruit intake opportunities with the purpose of preventing future lifestyle-related diseases. Using the findings, the first step of health education based on social marketing, "environment analysis," was conducted.

METHODS

A questionnaire survey was conducted using Google Forms, distributed by handouts with a QR code. Descriptive statistics and chi-square test were analyzed using IBM SPSS Statistics 24.Survey subjects: 300 students in the School of Nursing and 230 students in the School of Nutrition.Survey period: August 8, 2024 to October 14, 2024 Ethical considerations: Approved by the Research Ethics Review Committee, Schools of Nursing and Nutrition of Shukutoku University. (Approval number F24-02) Disclosure of conflicts of interest: None

RESULTS

1. Demographic environment: Of 247 total respondents (46.6% response rate), 26 were male, 210 were female, and 11 chose not to disclose their gender or department. The average fruit intake were male,157.6g were female 124.0g. 2. Economic environment: 47 respondents (19%) do not eat fruits even once a week. The most cited reason was a “fruits are expensive” (29 respondents, 61.7%). 3. Physical environment: For “opportunities to eat fruit,” 106 (42.9%) answered “dinner” and 11 (4.5%) responded “lunch”. On-campus facilities, including one store and a cafeteria, do not offer fruit, making fruit intake during lunch challenging. 4. Technical environment: The university subsidizes part of the cost of operating the cafeteria, which is managed by an external contractor. Changes to the cafeteria menu and pricing needs consultation. 5. Political and legal environment: No issues. 6. Sociocultural environment:169 respondents (68.4%) have intention to increase their fruit intake.

CONCLUSIONS

Increasing fruit availability in the cafeteria and subsidizing costs may encourage more fruit intake by university students.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_040

FURAN FATTY ACID SUPPLEMENTATION PROTECTS AGAINST MUSCLE WASTING IN MOUSE MODELS OF CANCER CACHEXIA

Anais Deglos[1]; Christelle Bertrand-Gaday[1]; Erwann Durand[2]; Beatrice Bonafos[1]; Laurent Vaysse[3]; Siriluck Liengprayoon[4]; Laurence Pessemesse[1]; Charles Geminard[5]; Charles Coudray[1]; Christine Feillet-Coudray[1]; Alexandre Djiane[5]; Francois Casas[1]
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BACKGROUND AND OBJECTIVES

Cancer cachexia is a global metabolic syndrome characterized by rapid, involuntary weight loss associated with muscle wasting and adipose tissue loss. It diminishes response to chemotherapy, leads to deterioration in general condition and increased mortality. However, there is currently no effective treatment. Recently, we demonstrated that a preventive furan fatty acids (FuFA-F2) supplementation, a natural compound found in many foods, increased muscle mass in healthy or obese mice. This study aimed to determine whether FuFA-F2 supplementation is capable of counteracting or slowing the onset of muscle wasting *in vitro* and *in vivo* in different models of cancer cachexia in mice.

METHODS

As an *in vitro* cachexia model, we used TNF-α/IFNγ-treated C2C12 myotubes. On these atrophied myotubes, treated or not with FuFA-F2 (10µM), we assessed myotube size by immunofluorescence and protein synthesis and degradation pathways were analyzed. To study the influence of FuFA-F2 on cancer cachexia in vivo, we used colon-26 carcinoma tumor-bearing mouse a model. We monitored the longitudinal condition of the animals (weight, body composition, tumor size, locomotor activity, etc.). After sacrifice, muscles were weighed and protein synthesis and degradation pathways were studied.

RESULTS

In TNF-α/IFNγ-treated C2C12 myotubes, we found that preventive addition of FuFA-F2 abolished muscle wasting, whereas treatment of already atrophied myotubes resulted in partial size recovery. In C-26 mouse model, we observed that preventive FuFA-F2 supplementation avoided muscle wasting and improved spontaneous locomotor activity. However, it had no effect on tumor development or fat loss. When FuFA-F2 was given after the pre-cachexic phase, it limited muscle wasting. Synthesis and degradation pathway analysis by western-blot revealed the specific role of FuFA-F2 in in vitro and in vivo models.

CONCLUSIONS

Our findings showed that FuFA-F2 supplementation effectively prevents muscle wasting *in vitro* in a model of atrophic C2C12 myotubes, and *in vivo* in colon-26 carcinoma tumor-bearing mouse a model. This study highlights that nutritional supplementation with FuFA-F2 could be an effective approach to reduce cancer cachexia and preserve muscle mass.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_041

RELATIONSHIP BETWEEN EATING SPEED AND OBESITY OR FOOD INTAKE IN THE WORKING GENERATION: A CASE STUDY OF JAPANESE MALES

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BACKGROUND AND OBJECTIVES
Obesity (Body mass index [BMI (kg/m2)]) rates have been reported to be high among people who have the habit of eating fast. This study aimed to clarify the relationship between eating speed and lifestyle diseases or usual food intake among working men.

METHODS
A food frequency questionnaire was conducted with employees in manufacturing companies, the data from regular checkups for responders were combined, and data from 299 male employees were analyzed. The relationship between eating speed (fast, normal, and slow) and age, BMI, blood pressure level, or food intake was examined using the Kruskal–Wallis test. This study was approved by the Ethics Review Committee. Statistical analysis was performed using the analysis software IBM SPSS Statistics 29. The significance level was set at 5%.

RESULTS
The fast-eating, normal-speed eating, and slow-eating groups consisted of 104 (34.8%), 169 (56.5%), and 26 (8.7%) people, respectively. Furthermore, people with the habit of slow eating were younger, less obese (BMI ≥ 25 kg/m2) ($p = 0.046$), and consumed more fish and shellfish ($p = 0.038$), and side dishes (dishes prepared with vegetables, potatoes, mushrooms, and seaweed as the main ingredients) ($p = 0.028$) than those in the other groups. In the subgroup analysis by age category, no significant differences in all parameters in people aged at least 40 years were found between the groups. However, differences in BMI ($p = 0.017$) and side dishes ($p = 0.015$) were still significant between the groups aged no more than 39 years. Moreover, those who ate more slowly had a higher consumption of vegetables ($p = 0.027$) and seaweed ($p = 0.011$).

CONCLUSIONS
Fewer working men in their mature years eat slowly, and young people (≤39 years old) with the habit of slow eating have a higher vegetable intake and are less obese, suggesting that eating speed is associated with obesity and vegetable intake.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_042

CELIAC DISEASE: EPIDEMIOLOGICAL AND CLINICAL PERSPECTIVES IN ALGERIA

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BACKGROUND AND OBJECTIVES
Celiac disease has seen significant progress in its epidemiological, clinical, and pathophysiological understanding. It is no longer considered exclusively a childhood disease, and its clinical manifestations extend beyond digestive symptoms. The lifelong gluten-free diet, especially in Algeria, presents numerous challenges that hinder adherence.
Objective: This study aimed to explore the clinical and epidemiological dimensions of celiac disease and critically assess the challenges faced by patients and the management difficulties encountered by doctors.

METHODS
Two surveys were conducted using online questionnaires: one targeted celiac disease patients, and the other targeted doctors. These surveys evaluated the prevalence, clinical features, and the challenges related to the management of celiac disease.

RESULTS
Our findings reveal a clear predominance of female patients (83%), with the most affected age group being 21–30 years (40%), though cases were also observed in individuals aged 61–80 years. Autoimmune diseases were associated with 8% of patients, and 84% of doctors reported screening for such conditions after a celiac disease diagnosis. Symptoms were highly diverse, with a predominance of digestive signs, anemia, weight loss, and anxiety.Patients reported numerous difficulties, particularly the high cost of gluten-free products, cited by 113 respondents as a significant barrier.

CONCLUSIONS
This study confirms that celiac disease affects all age groups and manifests through a variety of symptoms, which are increasingly recognized by healthcare providers. It also underscores the significant challenges posed by adherence to a gluten-free diet in Algeria.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_043

PREVALENCE OF RISK AND PROTECTIVE FACTORS FOR NON-COMMUNICABLE DISEASES AMONG UNIVERSITY STUDENTS IN BRAZIL: NATIONAL HEALTH SURVEY 2013 AND 2019

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BACKGROUND AND OBJECTIVES
The global increase in the prevalence of non-communicable diseases (NCDs) is linked to behaviors related to diet, physical activity, and alcohol consumption. The academic period emerges as a transitional phase in life that can impact these behaviors, which can either increase or decrease the risk of NCD occurrence. Therefore, this study aimed to was to assess the evolution of risk and protective factors among Brazilian university students.

METHODS
Data from Brazilian adult students (≥18 years) from the two editions of the National Health Survey (PNS), conducted in 2013 and 2019, were used. Participants reported being enrolled in a degree program at the time of the interviews. Risk factors included markers of unhealthy eating, insufficient physical activity, and excessive alcohol consumption, while protective factors involved markers of healthy eating and physical activity during leisure time. Descriptive analysis was performed on all indicators, stratified by survey year and sex. Significant differences were observed through the non-overlap of 95% confidence intervals (CI 95%).

RESULTS
A reduction was observed in the prevalence of regular consumption of soft drinks (27.9% to 12.5% ─ men; 22.8% to 10.7% ─ women), regular consumption of sweets (27.1% to 17.6% ─ men; 33.2% to 20.4% ─ women), and insufficient physical activity (37.6% to 22.7% ─ men; 57.7% to 37.3% ─ women). There was an increase in the regular consumption of fruits and vegetables (16.1% to 27.2% ─ men; 22.6% to 34% ─ women) and physical activity during leisure time among women (28.3% to 37.3%). Excessive alcohol consumption remained stable over the years.

CONCLUSIONS
The RESULTS indicate that most risk indicators for NCD occurrence decreased over the years. However, the frequency of regular consumption of fruits and vegetables and recommended physical activity remains low among most students, and the percentage of excessive alcohol consumption remains high. Therefore, it is essential to strengthen measures to reduce alcohol consumption, as well as create spaces that enable healthy food choices and physical activity in universities, to contribute to better living and health conditions for students.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_044

ASSOCIATIONS BETWEEN POLYPHENOL INTAKE AND PSORIASIS RISK: A PROSPECTIVE COHORT STUDY FROM THE UK BIOBANK

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BACKGROUND AND OBJECTIVES

Psoriasis is an inflammatory skin disease affecting quality of life. Polyphenols, bioactive compounds found in various plant-based foods, known for their anti-inflammatory and antioxidant properties, may influence risk of psoriasis onset (1). This study investigated the association between dietary polyphenol intakes and psoriasis incidence using the UK Biobank cohort (2).

METHODS

The study included participants from the UK Biobank who were initially free of psoriasis and followed for an average of 14 years. Participants with chronic inflammatory infectious diseases (HIV or chronic viral hepatitis) were excluded. Participants who completed at least two 24-hour dietary recalls were included; polyphenol intakes were estimated from foods such as tea, coffee, chocolate, wine, juice, cereal, bread, fruits, vegetables, snacks, legumes, and nuts. Polyphenol composition data were derived from a combined database integrating the USDA and Phenol-Explorer databases(3). Flavonoid subcategories included anthocyanins, flavanones, flavan-3-ols, flavonols, flavones, and polymers, while total polyphenol intake was derived from the sum of flavonoids, stilbenes, phenolic acids, and lignans. The primary outcome was the incidence of psoriasis, identified through self-reported diagnoses, primary care records, and hospital admission data.

RESULTS

Among the 121,584 participants, 1,073 developed psoriasis, yielding an incidence rate of 0.88%. The mean age (SD) was 56.2 (7.8) years, with 54.8% (n = 60,341) being female, and the majority of participants (96.8%) identifying as White. After adjusting for potential confounders, including age, sex, Townsend deprivation index, socioeconomic status, physical activity, smoking status, alcohol frequency, supplement use, red and processed meat intake, free sugar intake, BMI, and energy intake, higher flavonoid intake (Q4: 1890–8032 mg/d) was associated with a 23% reduced risk of incident psoriasis (HR: 0.77, 95% CI: 0.64–0.94, *P*trend = 0.016) compared to lower flavonoid intake (Q1: 0–921 mg/d). However, no significant association was observed for total polyphenol intake.

CONCLUSIONS

In this large cohort study, higher flavonoid intake was associated with a reduced risk of psoriasis, highlighting the potential protective benefits of flavonoid-rich foods. Future research should focus on randomized controlled trials to establish causality and explore underlying mechanisms.

CONFLICTS OF INTERESTS

TM has received honoraria from Abbvie, Almirall, Amgen, Galderma, Pfizer, Novartis, UCB Pharma, L'Oreal and Proctor & Gamble.WLH has received research funding from the Alliance for Potato Research & Education and the Almond Board of California, as well as consultancy fees from ZOE Ltd, and funding to attend a conference from Yakult UK Ltd.

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EPO6_045

ASSOCIATIONS BETWEEN FOOD INTAKE, ACNE, AND ACNE-RELATED COMORBIDITY: A CROSS-SECTIONAL SECONDARY ANALYSIS USING UK BIOBANK DATA

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BACKGROUND AND OBJECTIVES
Acne, one of the most common inflammatory skin diseases, affects around 9.4% of the global population (1). Its significant global health burden extends beyond physical symptoms to include comorbidities such as metabolic disorders and depression (2, 3). While diet is considered an approach to managing acne and its comorbidities, evidence-based dietary guidelines remain lacking, and large-scale studies exploring diet-acne associations are scarce. This study aims to investigate the dietary intake patterns of individuals aged 40–69 with acne and to evaluate their associations with the development of acne and related comorbidities, utilizing data from the UK Biobank.

METHODS
This study included 5,709 participants with a current or prior history of acne (acne group) and 493,515 without a history of acne (non-acne group) at baseline, identified through self-reported diagnoses, primary care records, and hospital admission data. Participants with underlying diseases linked to hormonal dysregulation and acne-like manifestations were excluded. Dietary intake was assessed using a baseline Food Frequency Questionnaire (FFQ), covering 16 food groups (e.g., vegetables, fruits, fish, meat, bread, cereal and cheese). Multiple logistic regression was applied to assess associations between food intake and acne development.

RESULTS
The acne group (mean age = 52 years) was, on average, five years younger than the non-acne group and had a higher proportion of females (64% vs. 54%). In the regression analysis of food intake and acne (n = 499,224), significant associations were observed between acne and the intake of specific foods, quantified by their respective units: cooked vegetables (tablespoons/day, adjusted OR = 0.96 [0.95–0.98], adjusted P = 0.002), non-oily fish (times/week, aOR = 1.04 [1.01–1.08], adjusted P = 0.035), and cheese (times/week, aOR = 0.96 [0.94–0.97], adjusted P < 0.001), after adjusting for BMI, age, sex, ethnicity, physical activity, socioeconomic status, smoking, alcohol, sleeplessness, and supplement use (Model 2). These findings remained consistent across Model 1 (without BMI adjustment), Model 3 (Model 2 with interaction terms for age and sex), and sensitivity analysis (no diet changes in the past 5 years' subgroup).

CONCLUSIONS
Cooked vegetables and cheese may have a protective effect against acne and its comorbidities; however, this association could also reflect dietary changes made by acne patients. Further cohort and RCTs are warranted to confirm these findings.

CONFLICTS OF INTERESTS
TM has received honoraria from Abbvie, Almirall, Amgen, Galderma, Pfizer, Novartis, UCB Pharma, L'Oreal and Proctor & Gamble.WLH has received research funding from the Alliance for Potato Research & Education and the Almond Board of California, as well as consultancy fees from ZOE Ltd, and funding to attend a conference from Yakult UK Ltd.

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EPO6_046

ANALYSIS OF THE EFFECTS OF DIETARY CHANGES ON THE GUT IMMUNE SYSTEM

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BACKGROUND AND OBJECTIVES

The body contains B cells that produce antibodies with diverse specificities, forming a diverse population known as the “antibody repertoire.” The antibody repertoire is influenced by various factors such as diet and gut microbiota, and it is believed to be closely related to health conditions and the onset of diseases. In this study, we aimed to investigate the potential involvement of the gut immune system and antibody repertoire in the development of lifestyle-related diseases by examining changes in a lifestyle-related disease model mouse.

METHODS

Previous studies have shown that the antibody repertoire of intestinal IgA antibodies undergoes significant changes in mice fed high-sucrose diets (HS diet, 70 kcal% sucrose) and high-fat diets (HF diet, 45 kcal% fat), which are thought to induce the onset of lifestyle-related diseases. This suggests that dietary changes may affect the IgA specificity in the gut. Based on these findings, we investigated the potential impact of changes in gut components on immune cells by using bone marrow-derived dendritic cells (BMDC).

RESULTS

When the intestinal lavage fluid (gut fluid) from mice fed three different diets was administered to BMDCs, an increase in activation markers of dendritic cells and enhanced production of inflammation-related cytokines were observed.

CONCLUSIONS

This study suggested that dietary intake influences the gut environment, leading to an increase in molecules that stimulate dendritic cells. Future research will focus on further analyzing the mechanisms by which dendritic cells are stimulated and the related factors.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_047

ALCOHOL AND CANCER: POLICY RECOMMENDATIONS TO REDUCE THE HEALTH IMPACTS OF ALCOHOL

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BACKGROUND AND OBJECTIVES
In some instances alcohol is still included as part of dietary guidelines or recommendations, despite being non-nutritive, often highly caloric, and the potential to be nutrient-displacing. Furthermore, the carcinogenic mechanisms of alcohol are well established and there is strong evidence that consuming alcohol increases the risk of seven types of cancer, including common cancers like breast and colorectal.

Without clear nutrition and health messaging, public awareness of the links between alcohol and cancer remain very low, and many countries lack national alcohol strategies or policies that support population-level reduction of alcohol consumption.

WCRF International has developed the Alcohol and Cancer Risk policy position to provide policymakers and governments with best-practice alcohol-control policies. When implemented, these evidence-based policies can help reduce the risk of cancer as well as contribute to a reduction in other health, social and economic harms caused by alcohol.

METHODS
A review of evidence, global recommendations, and existing and proposed policies was conducted to determine a set of best-practice policies. Recommendations were reviewed by public health and alcohol policy experts.

RESULTS
WCRF International's alcohol policy recommendations were developed to consider a multisectoral approach and include four policy areas: 1) implementing fiscal measures to make alcohol less affordable and accessible; 2) restricting the physical availability of alcohol; 3) implementing mandatory health warning labels; and 4) restrictions on promotions, advertisements and marketing of alcohol products.

CONCLUSIONS
WCRF International's alcohol policy recommendations provide concise guidance on four policy priority areas for governments and policy advocates to improve alcohol control and increase public awareness. It also offers guidance on important considerations around implementing these measures, such as language, conflicts of interest, and no- and low-alcohol products—all of which are very important to consider alongside advocacy for nutrition policy such as marketing restrictions, fiscal policies, labelling, and dietary guidelines.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_049

ASSOCIATION BETWEEN ALPHA-1-ACID GLYCOPROTEIN AND NON-ALCOHOLIC FATTY LIVER DISEASE AND LIVER FIBROSIS IN ADULT WOMEN: EVIDENCE FROM NHANES 2017–2023

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BACKGROUND AND OBJECTIVES
Alpha-1-Acid Glycoprotein (AGP) is one of the plasma proteins synthesized by the liver, which is mainly secreted by hepatocytes. As an acute phase glycoprotein, its serum level plays a regulatory role in the processes of inflammation and metabolic disorders. Nonalcoholic fatty liver disease (NAFLD) and liver fibrosis (LF) are closely associated with inflammation and metabolic disorders. However, the relationship between AGP and NAFLD and LF remains unclear. Due to the limitations of liver biopsies, more non-invasive serum biomarkers are needed to assess the progression of hepatic steatosis and fibrosis. The objective of this study was to examine the potential correlation between AGP and NAFLD and LF.

METHODS
The data employed in this cross-sectional survey were derived from the 2017-2023 National Health and Nutrition Examination Survey (NHANES). NAFLD was defined as controlled attenuation parameter (CAP) ≥274 dB/m, and LF was defined as liver stiffness measurement (LSM) ≥8.0 kPa. Non-linear relationships were described by fitting smoothed curves and using threshold effect analysis. Subgroup analyses were also performed, including stratification by different characteristics such as race, education, body mass index (BMI), and lipid levels, etc., in order to assess potential regulatory factors of the association between AGP and NAFLD and LF.

RESULTS
This population-based study included 2,270 females aged 20-49 years. In logistic regression analyses, AGP was found to be significantly and positively associated with NAFLD [OR = 13.86, 95% CI (8.94, 21.46), $p < 0.001$] and LF [OR = 3.08, 95% CI (1.58, 6.00), $p < 0.001$]. Subgroup analyses demonstrated that hypertension modified the correlation between AGP levels and NAFLD ($p < 0.05$ for interaction), with positive associations between AGP and NAFLD and LF observed in all subgroups. Additionally, the relationship between AGP and CAP exhibited nonlinear characteristics. Using a two-stage linear regression model, we found an inverted U-shaped relationship between AGP and NAFLD, with an inflection point at 1.20 g/L.

CONCLUSIONS
Our findings revealed a significant positive correlation between elevated AGP levels and both NAFLD and LF. This highlights the potential of AGP as a non-invasive diagnostic marker for NAFLD and LF, helping clinicians improve the diagnosis and treatment of chronic liver disease.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_051

FOOD QUALITY CONSUMPTION AND METABOLIC SYNDROME COMPONENTS ACCORDING TO TASTE PERCEPTION IN UNIVERSITY STUDENTS

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BACKGROUND AND OBJECTIVES

University students deal with challenges that affect food quality consumption (FCQ), and early presence of metabolic syndrome's components (MSC). Although FQC might be linked to MSC, taste perception could be a factor influencing both. This study aims to analyze FQC and MSC according to taste perception in university students.

METHODS

We included university students 18 years old or older, non-lactating or non-pregnant, and without taste alterations, after signing a consent form. After completing questionnaires on sociodemographics, lifestyle, and FQC (Mini ECCA v2), participants underwent assessments for anthropometrics, blood pressure,and blood samples. Participants rated taste intensity (0-5 points) for bitter (PROP), sweet (sucrose), salty (NaCl), sour (citric acid) and umami (monosodium glutamate), at five different concentrations. A Total Taste Score was determined with the sum of the perceived taste perception at the maximum concentration of each taste, and subjects were classified as having high perception (equal or greater than the median) or low perception (lower than the median). FQC and MSC frequency were compared according to taste perception (chi-square, $p<0.05$ considered as significant).

RESULTS

We involved 330 participants (63% women + 21.3 years); 54.5% did not present MSC, while 30.6% presented one component; 8.2%, two, and 6.7%, three or more components, being abdominal obesity the most frequent (36%). In FQC, 28.2% had healthy habits, 27.6% needed improvement, and 44.2% had unhealthy habits. A subsample of 49 participants underwent taste tests perception. Trends between taste perception and MSC were observed for hyperglucemia ($p=0.064$) and abdominal obesity ($p= 0.080$). Although there was a higher proportion of subjects with healthy habits in the high taste perception group vs. the low perception (30.8%), these differences were not significant ($p=0.174$).

CONCLUSIONS

Taste perception may influence MSC in university students, and although no differences were found for FQC, a larger sample is needed to identify possible associations in this population, in order to

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The authors have no conflict of interest.

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EPO6_052

PREVALENCE OF MULTIMORBIDITY AMONG GUATEMALAN WOMEN: ASSESSMENT OF SOCIAL, DIETARY AND REPRODUCTIVE FACTORS

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BACKGROUND AND OBJECTIVES
Guatemala's ongoing epidemiological and nutritional transition may be reshaping morbidity patterns, especially among women exposed to social, reproductive, and dietary risk factors. This study aimed to: 1) estimate the prevalence of multimorbidity and 2) identify its key determinants among Guatemalan women of reproductive age (20-49 y).

METHODS
We conducted a cross-sectional secondary data analysis of the 2017 Epidemiological Health and Nutrition Surveillance System (SIVESNU). Multimorbidity was defined as the presence of two or more chronic diseases (hypertension, obesity and/or diabetes) in an individual. Descriptive statistics and ordinal logistic regression models were conducted to examine associations with early-life conditions (short-stature), social (ethnicity, education, socioeconomic status, household area), dietary (a 24 hour-recall of ultra processed food consumption and minimum diet diversity) and reproductive factors (parity and age of first birth).

RESULTS
Among 1,151 women included, 18.5% (95% CI 15.8-21.6) had multimorbidity, with obesity and hypertension co-occurring most frequently (75%). Women with short stature (<149 cm) were 35% more likely to acumulate an additional chronic condition compared to taller women (OR: 1.35, 95% CI 1.08-1.97). No associations were found between multimorbidity and reproductive or dietary factors.

CONCLUSIONS
Approximately one in five Guatemalan women of reproductive age lives with multimorbidity, predominantly involving obesity and hypertension. This highlights the need for targeted intervention addressing chronic conditions from a life-course perspective.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_054

CORTISOL AND CARDIOMETABOLIC HEALTH IN WORKING-CLASS WOMEN: ASSOCIATION WITH DIETARY PATTERN AND STRESS

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BACKGROUND AND OBJECTIVES
Chronic stress and elevated cortisol levels are linked to cardiometabolic risks, but their relationship with dietary patterns in working-class women is understudied. Dietary habits and stress are critical determinants of metabolic health, particularly in populations balancing the demands of professional and personal responsibilities. The study investigated the association between cortisol levels, cardiometabolic risk factors, and dietary pattern among working class women.

METHODS
A cross-sectional study design was employed to assess working-class women aged 18-65 years in three occupational sectors: banks, private hospitals and factories. A total of 400 participants were selected using a multi-stage sampling technique. Data was collected using a structured and validated questionnaire, biochemical analysis (cortisol and blood glucose levels), blood pressure and anthropometric measurements (weight, height and body mass index (BMI). The collected data were analyzed using IBM-SPSS software, version 23. Descriptive statistics were used to summarize the data, while inferential statistics were applied to identify significant relationships between variables. A significance level of $p < 0.05$ was set for all statistical analysis.

RESULTS
Most of the participants were aged 26–35 years (40.5%), with 55.8% being single. A small proportion reported experiencing low stress (2.0%) and high stress (4.7%) levels. Overweight was prevalent among the study population (41.5%) and majority (74.5%) reported skipping meals, with 64.3% having a medium dietary diversity score. A significant association was found between cortisol and blood glucose levels ($p < 0.05$). However, no significant relationships ($p > 0.05$) were observed with body mass index (BMI), blood pressure, or meal frequency.

CONCLUSIONS
The study revealed a high prevalence of poor dietary pattern and overweight among participants, with a significant association between cortisol and fasting blood glucose levels. There is a need for targeted interventions addressing dietary habits and stress management to improve the metabolic health of this population.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_056

Android to Gynoid Fat Ratio (AOI), Gut Microbiota, and Hyperuricemia: RESULTS from two large human cohort studies

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BACKGROUND AND OBJECTIVES

The prevalence of hyperuricemia (HUA) in China has reached 17.7%. Understanding the impact of fat distribution and its interaction with gut microbiota on the risk of incident HUA is critical for HUA prevention.

METHODS

This study included 2,026 Chinese adults from the Lanxi Cohort. We used Android to gynoid fat ratio (AOI) as indicator of abdominal fat distribution, which was measured by a dual-energy X-ray absorptiometry (DXA) scan. 16S rRNA sequencing was performed on stool samples from 1,561 participants. Multivariable linear regression and logistic regression models were used in all analyses. And replications were performed in another independent cohort, the WELL-China Cohort, with 6,990 participants.

RESULTS

During the follow-up period of 4 years, 199 participants developed HUA. Compared to participants in the lowest tertile of AOI at baseline, the OR(95%CI) for incidence of new-onset HUA in the middle and highest tertiles were 2.02(1.22-3.36) and 1.94(1.22-3.09), respectively. For each additional 1 standard deviation of changes in AOI during follow-up, the HUA risk increased by 18% (p=0.03). Gut microbial analyses showed that participants with higher AOI exhibited decreased α-diversity and altered β-diversity. Fifteen genera were found to be linked to AOI, and the AOI-microbial index (AMI) constructed by them was positively associated with HUA risk (p=0.003). Similar RESULTS were obtained in the validation cohort.

CONCLUSIONS

Abdominal fat accumulation is an independent risk factor for new-onset of HUA, and monitoring dynamic changes in AOI may help predict HUA. Additionally, the interaction between AOI and gut microbiota further contributes to the incidence of HUA.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_058

APPLE CIDER VINEGAR ATTENUATES HEART DAMAGE AND OXIDATIVE STRESS IN RATS INDUCED METABOLIC SYNDROME

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BACKGROUND AND OBJECTIVES
Heart failure (HF) is a critical health issue with no effective current treatment. Metabolic syndrome (MetS) is a major risk factor for HF. Oxidative stress (OS), a key factor in the progression of MetS, contributes to endothelial dysfunction, inflammation and apoptosis of cardiac cells. Antioxidant dietary supplements may counteract the harmful effects of MetS. Although apple cider vinegar (ACV) is known for its antioxidant properties, its impact on cardiovascular lesions in MetS has not been thoroughly studied and requires further research. Thus, this work aimed to evaluate the antioxidant activity of ACV on heart tissue in Wistar rat used as an experimental model of MetS.

METHODS
Eighty male Wistar rats weighing about 185 ± 10 g were divided into 3 equal groups and fed for 5 months of experimentation either the standard laboratory diet (RS) or the cafeteria-fructose diet (RCF), supplemented or not with ACV (RCFV) at a rate of 3,5 ml/kg/day by intragastric gavage for 30 days from the 4th month of experimentation. Body weight was monitored throughout the experiment. Subsequently, oxidative stress biomarkers were identified in the cardiac tissue, and a histological examination was carried out.

RESULTS
ACV treatment effectively reversed heart changes observed in the RCF group. It had a significant protective effect against lipid peroxidation and increased the levels of glutathione (GSH), and the activities of superoxide dismutase (SOD), glutathione peroxidase (GPx), and catalase (CAT) in heart tissue. Moreover, ACV improved cardiac structure which showed a regular organisation of muscle fibres and a reduction in fatty infiltration.

CONCLUSIONS
In conclusion, ACV prevented cafeteria-fructose diet induced heart damage throught its antioxidant activity. The RESULTS obtained could therefore open up promising prospects for the use of ACV in the management of MetS and its cardiovascular complications.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_059

THE PRIME DIET QUALITY SCORE (PDQS), MORTALITY AND CHRONIC MORBIDITY IN UK BIOBANK: A PROSPECTIVE STUDY

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BACKGROUND AND OBJECTIVES

The Prime Diet Quality Score (PDQS) is a global food-based metric for assessing diet quality. We conducted a comprehensive evaluation of the PDQS-measured diet quality with mortality and major chronic morbidity outcomes among UK adults.

METHODS

This was a population-based cohort study of UK Biobank participants (aged 40-69) recruited in 2006-2010 and followed up until 2021. The PDQS was calculated from two or more 24-hour diet recall assessments. We used multivariable Cox regression to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) for associations with total and cause-specific mortality, cardio-metabolic disease outcomes including type 2 diabetes (T2D), cardiovascular disease (CVD), myocardial infarction (MI), ischemic and haemorrhagic stroke, respiratory diseases (total chronic, chronic obstructive pulmonary disease/COPD, asthma), cancers (total, lung, colorectal, oesophageal, postmenopausal breast and prostate), neurodegenerative diseases (total, Parkinson's, dementia including Alzheimer's, depression and anxiety), non-alcoholic fatty liver disease (NAFLD), chronic kidney disease (CKD), eczema, psoriasis, fracture and osteoporosis.

RESULTS

The final analytical sample included 124,851 participants with mean (SD) age of 59(8) at baseline. Participants in the top quartile (Q4) of the PDQS had a lower risk of mortality compared to those in the lowest quartile with HRs (95%CIs) of 0.84 (0.78, 0.91) for total mortality, 0.88 (0.80, 0.97) for cancer mortality and 0.66 (0.47, 0.93) for respiratory mortality. The HRs for chronic morbidity were: 0.73 (0.66, 0.81) for type 2 diabetes, 0.80 (0.71, 0.90) for myocardial infarction, 0.86 (0.74, 1.00) for ischemic stroke, 0.80 (0.69, 0.94) for COPD, 0.94 (0.88, 0.99) for total cancer, 0.75 (0.58, 0.97) for lung cancer, 0.85 (0.78, 0.92) for anxiety, 0.66 (0.56, 0.77) for non-alcoholic fatty liver disease and 0.74 (0.69, 0.80) for chronic kidney disease.

CONCLUSIONS

A high-quality diet, as measured by the PDQS, is associated with reduced risks of mortality and major chronic disease morbidity. The PDQS, as a simple and practical metric, holds significant potential for measuring diet quality and promoting healthier dietary patterns.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_060

IDENTIFICATION OF EARLY-RISK FACTORS AND THEIR ASSOCIATION WITH CARDIOMETABOLIC OUTCOMES IN CHILDREN AND ADOLESCENTS

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BACKGROUND AND OBJECTIVES
Various alterations in maternal metabolic and endocrine status before and during gestation may increase the risk of cardiometabolic outcomes, including glucose intolerance, dyslipidemia and hypertension, which frequently lead to metabolic syndrome and type 2 diabetes (T2D) later in childhood and adolescence. Therefore, the aim of the present study was to identify and evaluate early-life risk factors during preconception, pregnancy and birth, and early infancy periods for cardiometabolic outcomes in childhood and adolescence.

METHODS
We selected electronic database (Medline, EMBASE, WEB OF SCIENCE, SCOPUS, and Cochrane CENTRAL) to identify longitudinal studies published between the database's inception and July 26, 2024. We only included articles that studied risk factors in mothers, fathers and infants, from preconception to infancy <2 years, associated with cardiometabolic outcomes later in life between 2 and 18 years.

RESULTS
67 studies were included and 163 positive associations were found between early life risk factors and cardiometabolic outcomes, especially with hypertension, glucose intolerance, metabolic syndrome and T2D, later in childhood and adolescence. Low and high birth weight, gestational diabetes and sociodemographic factors were the most frequent risk factors associated with higher risk cardiometabolic outcomes.

CONCLUSIONS
Multiple early-life risk factors were associated with cardiometabolic outcomes during childhood and adolescence. These RESULTS are useful for predicting the risk for childhood cardiometabolic outcomes and for identifying modifiable factors. They may facilitate the design of approaches aimed at alternating several behaviors from birth to infancy, including maternal and paternal habits, as well as the preconception to infancy transition period.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_061

NUTRITION SUPPLEMENTATION COMBINED WITH EXERCISE VERSUS EXERCISE ALONE IN TREATING KNEE OSTEOARTHRITIS: A DOUBLE-BLINDED, RANDOMIZED, PLACEBO-CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
To investigate the effectiveness of formula nutrition supplementation (mainly containing glucosamine sulfate, chondroitin sulfate, rhizoma drynariae) plus supervised exercise versus exercise alone for the treatment of knee osteoarthritis (OA).

METHODS
This was a double-blinded, single-center, randomized, placebo-controlled trial. The study recruited 65 participants (40-75 years) with knee OA. Participants were randomly allocated to nutrition supplementation plus exercise (N+E) group or placebo plus exercise (P+E) group. The intervention lasted for 6 months. The primary outcome was Western Ontario and McMaster Universities osteoarthritis index (WOMAC). Secondary outcomes included physical function and performance scores, lower extremity strength, and serum biomarkers.

RESULTS
Among the 65 randomized patients, 56 (86%) completed the trial. At 3 months, more participants in N+E group than in P+E group achieved minimum clinically important difference (MCID) in WOMAC total score (19/30 [63.3%] vs 8/26 [30.8%]; $P < 0.01$). At 6 months, more participants in N+E group than in P+E group achieved MCID in WOMAC stiffness score (19/30 [63.3%] vs 10/26 [38.5%]; $P < 0.05$). Meanwhile, at 6 months the decreased percentages of WOMAC stiffness score in N+E group was greater than in P+E group ($P < 0.05$). The flexor peak torque at 120°/s and 180°/s in N+E group were significantly higher than those in P+E group at 3 months ($P < 0.05$). Moreover, compared with baseline, improvements in the WOMAC overall and pain score, visual analogue scale pain and 30-second chair stand test were observed in both groups at 6 months. However, these indicators in N+E group were improved as early as 3 months ($P < 0.05$).

CONCLUSIONS
The improvement effects of nutrition supplementation plus exercise were superior to those of exercise alone, and the improvement occurred earlier. Nutrition supplementation plus exercise would be a more efficient strategy for knee OA.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_062

PREVALENCE AND RISK FACTORS FOR OVERWEIGHT AND OBESITY AMONG AFRICAN MEN AND WOMEN: A SYSTEMATIC REVIEW AND META-ANALYSIS

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BACKGROUND AND OBJECTIVES
This systematic review and meta-analysis assessed the prevalence and risk factors associated with overweight and obesity among African men and women.

METHODS
A systematic search was performed across multiple databases: MEDLINE, EMBASE, CINAHL, Web of Science, Scopus, Google Scholar, African Index Medicus, and African Journals Online, to identify studies reporting the prevalence and risk factors of overweight and obesity in both men and women in Africa. Two independent reviewers conducted study selection, data extraction, and quality assessment. The pooled prevalence of overweight and obesity was calculated using a random-effects meta-analysis, and heterogeneity among studies was assessed using the I^2 statistic. Thematic analysis was employed to summarize the risk factors associated with overweight and obesity

RESULTS
The search yielded a total of 1,897 studies, of which 68 met the eligibility criteria— all of which were cross-sectional studies. Among these, 23 studies on overweight and 28 studies on obesity were included in the meta-analysis. The overall prevalence of overweight was found to be 26.58% (95% CI: 21.80–31.35). The pooled prevalence of overweight was 29.89% (95% CI: 23.67–36.11) in women and 23.09% (95% CI: 16.29–29.90) in men. The overall prevalence of obesity was 18.91% (95% CI: 16.22–21.61). The pooled prevalence of obesity was 26.43% (95% CI: 21.03–31.83) in women and 10.46% (95% CI: 8.34–12.59) in men. The factors significantly associated with overweight and obesity were categorized into three themes: socio-economic and demographic (gender, age, education, ethnicity, marital status, employment, monthly income, residential status, family history of overweight/obesity, and other non-communicable diseases); lifestyle, dietary, and behavioural (alcohol and food consumption, smoking, physical inactivity, lack of exercise, and contraceptive use); and reproductive factors (contraceptive use, parity, and multiple births).

CONCLUSIONS
The findings reveal a high prevalence of overweight and obesity among African men and women, posing a significant threat to the already vulnerable healthcare systems in African countries. This high prevalence underscores the urgent need for effective policies and interventions to tackle overweight and obesity across the continent.

CONFLICTS OF INTERESTS
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EPO6_063

LINKING SUSTAINABLE DIETARY PATTERNS TO GENERAL AND CENTRAL ADIPOSITY: INSIGHTS FROM THE PORTUGUESE POPULATION

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BACKGROUND AND OBJECTIVES
The increasing prevalence of obesity, particularly central adiposity, poses significant public health challenges due to its strong association with non-communicable diseases. In Portugal, central obesity affects over half of the adult population. While unhealthy dietary patterns are key to obesity, sustainable diets may offer protective effects. This study examines the relationship between the Diet Sustainability Score (DSS) and obesity indicators, including body mass index (BMI) and waist-to-height ratio (WHtR).

METHODS
Data from 2287 participants in the National Food, Nutrition, and Physical Activity Survey (IAN-AF 2015-2016) were analyzed. The DSS was derived from four dimensions: nutritional quality, environmental impact, economic affordability, and sociocultural acceptability. Logistic regression models assessed the associations between DSS and both general adiposity (BMI: under/normal weight vs. overweight/obesity) and central adiposity (WHtR: healthy vs. unhealthy central adiposity), adjusting for sex, age, education, and physical activity.

RESULTS
Higher DSS is associated with greater nutrient density, lower intake of ultra-processed foods, reduced environmental impacts (in terms of greenhouse gas emissions and land use), lower diet-related expenses, and greater cultural acceptability of diets. Furthermore, a higher DSS is linked to lower odds of overweight/obesity (OR=0.91, 95% CI=0.88–0.94) and unhealthy central adiposity (OR=0.91, 95% CI=0.87–0.95), suggesting that more sustainable dietary choices are associated with a reduced risk of adverse health outcomes.

CONCLUSIONS
These findings underscore the role of sustainable dietary practices in addressing obesity and highlight their relevance for integrated public health strategies. Incorporating nutritional, environmental, economic, and cultural dimensions can support long-term improvements in population health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_064

ASSOCIATION BETWEEN DIETARY PATTERNS, STRESS AND RISK OF METABOLIC SYNDROME AMONG FINANCIAL BANK WORKERS IN A METROPOLITAN CITY IN GHANA

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BACKGROUND AND OBJECTIVES
Metabolic syndrome (MetS) constitutes a cluster of cardiovascular risk factors that have profound implications for health. An increasing body of evidence underscores the association between MetS and various dietary habits and lifestyle factors, including stress. The financial banking sector, characterised by extended working hours and sedentary behaviours, may exacerbate these risk factors, thereby heightening the susceptibility to MetS. Hence the study aimed to investigate the relationships between dietary patterns, stress, and the risk of MetS among financial bank employees within a Metropolitan Assembly.

METHODS
This cross-sectional study focused on bank employees in a Metropolitan city in Ghana. Data collection was conducted using structured questionnaires alongside assessments of anthropometric, clinical, and biochemical markers. A multi-stage sampling method was employed to select 200 participants. Stress and dietary patterns were valuated using the Perceived Stress Questionnaire (PSQ) and a food frequency questionnaire, respectively. Data analysis was performed using SPSS version 27.0, and logistic regression was employed to ascertain associations between dietary patterns, stress, and MetS.

RESULTS
Approximately half of all participants (51.5%) reported experiences of stress. Dietary patterns were almost evenly distributed, with 47.7% adhering to an unhealthy diet and 52.3% adherence to healthy diet. The prevalence of MetS markedly different based on diagnostic criteria: 6.3% according to WHO standards, 1.6% per NCEP criteria, and 20.3% as per IDF standards. No significant association with MetS was found concerning sex (aOR=3.41, 95% CI: 0.723–16.07, p=0.121) or unhealthy diet (aOR=2.46, 95% CI: 0.53–11.53, p=0.254). However, stress was identified as a significant predictor of MetS (aOR=4.79, 95% CI: 1.09–21.12, p=0.039).

CONCLUSIONS
This study identified stress as a significant risk factor for development of MetS within the financial banking institutions. Advocacy and implementation of stress management programmes is therefore strongly recommended to mitigate the potential risk of MetS among such sedentary workers.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_066

DIETARY INTAKE OF POLYBROMINATED DIPHENYL ETHERS (PBDES) AND THE RISK OF OBESITY IN THE FRENCH E3N COHORT

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BACKGROUND AND OBJECTIVES
Polybrominated diphenyl ethers (PBDEs) are organic, lipophilic, and persistent environmental pollutants, with the primary exposure pathway for the general population being the consumption of contaminated food (1). Human exposure to PBDEs has been reported to adversely affect glucose metabolism, thyroid, and ovarian function, potentially increasing the risk of obesity (2). Therefore, the main objective of this study was to investigate the association between dietary intake of PBDEs and the risk of obesity/overweight or weight gain in the French *Etude Epidémiologique auprès des femmes de l'Education Nationale* (E3N) prospective cohort study.

METHODS
The present study included 66,467 women with a mean age of 52.47 years who were followed over 20 years. Cox proportional hazard regression models were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) for associations between the dietary intake of PBDEs and the risk of obesity (BMI>30kg/m2), overweight (BMI>25 kg/m2) and gain more than 10 kg during follow-up. The main model was adjusted for age, education level, smoking status, silhouette at puberty, alcohol consumption, total energy intake without alcohol, physical activity and BMI.

RESULTS
Higher dietary intakes of PBDEs were related to an increased risk of overweight (HR overweight (I SD increment) =1.07 (1.05-1.09), HR overweight (Q4 vs Q1) =1.13 (1.07-1.19), P-trend overweight <0.001) and weight gain of more than 10 kg (HR weight gain (I SD increment) =1.12 (1.09-1.14), HR weight gain (Q4 vs Q1) =1.28 (1.21-1.37), P-trend weight gain <0.001). In addition, a non-linear association (P non-linearity=0.0014, Poverall<0.001) between the dietary intake of PBDEs and the risk of obesity (HR obesity (Q4 vs Q1) =1.25 (1.15-1.37), P-trend obesity <0.001) was identified. The associations remained consistent when adjusting in addition separately for total fat, PUFA, n-3 PUFA, the main food sources of PBDEs and PCBs and dioxins intake as well as when running stratified analyses based on the follow-up duration.

CONCLUSIONS
The present prospective study identified a positive association between dietary intake of PBDEs and the risk of overweight, obesity and weight gain. These associations remained significant in multiple sensitivity and subgroup analyses. Further efforts, such as reinforcing public awareness and strengthening regulatory measures, are needed to reduce PBDEs contamination in food and lower exposure levels in the general population.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_067

SINGLE CENTER OBSERVATIONAL STUDY OF EFFECTS OF ACARBOSE ALONGSIDE STANDARD OF CARE WEIGHT LOSS INTERVENTIONS ON METABOLIC PROFILE IN PATIENTS WITH OBESITY

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BACKGROUND AND OBJECTIVES
The prevalence of obesity has increased exponentially over last 2 decades and more so after COVID pandemics along side numerous weight loss inteventions with both favourable and adverse health outcomes.

METHODS
Adults aged more than 18'th birthday were screened and diagnosed as a patient with obesity according to WHO criteria with Asian cut off. On enrollment brieft history about trajectories of weght changes and intercurrent medical illnesses since birth including use of medications, medical/surgical interventions and all attempts to loose weight with and without success were noted. Anthropometric indices including height, weight, BMI, WHR were measured before and after 3 months of intervention. All paticipants underwent 3 samples OGTT with insulin levels in all 3 samples alongside many other biochemistry tests in a NABL accredited laboratory. Estimations and analysis of the current dietary intakes were calculated and defined by inhouse distitians.
All enrolled participants underwent one on one diet and nutrition counseling including about health scenario of obesity and were explained in detais about the roadmap ahead including pharmacy and supplement presription and start up meal plan with briefing about grocery purchase, cooking techniques and physical activities.

RESULTS
There were significant reductions in weight and metabolic profiles including lipid profile, HS CRP, Hepatic transaminemis and glycemic parameter across wide range of metabolic derange ments. Amongst patients with dyslipidemia there were significant reductions in triglycerides and borderline elevations in HDL. To conclude there is a potential for optimising use of acarbose alongside dietary and lifestyle changes for medical weight loss in countries with low to very high consumptions of calories from junk food and due to its multimodal actions and safety profile it is assumed that majority of patients will need such approaches.

CONCLUSIONS
Asian Indian populations genetically differs from caucasians and subsequently at higher risk of diabetes and CVD adverse outcomes. Indians consume very high carbohydrate containg meals and associated with high prevalences of obesity with and without metabolic syndrome. Efforts are needed to raise awareness of the impact of lifestyle educations on metabolic derangements including metabolic syndrom, DM and CVD.The inerventions with lifestyle changes in patients with MS can decrease weight alongside visceral obesity and reductions in inflammatory/CVD markers including CRP and also increases HDL

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_069

HEALTHYW8 PROJECT – MULTI-MODAL (BIO-)MARKERS AND RISK OF OBESITY – A COMPREHENSIVE SCOPING REVIEW

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BACKGROUND AND OBJECTIVES

Obesity has been related to a number of chronic diseases, especially non-communicable ones, as well as related co-morbidities (1). It is a complex and multi-factorial complication, and many factors play a role, including age, gender, diet, physical activity (PA), psychological and emotional status, genetic make-up, epigenetics, and gut microbiota (2). One isolated biomarker could therefore not enable optimal risk stratification and prognosis for the individual. Rather, a combined set or multi-modal approach is required, integrating (bio-)markers from various domains, such as more classical markers (insulin, leptin), multi-omics (e.g., genetics, epigenomics, transcriptomics, proteomics, metabolomics), behavioral attributes (dietary and sleep patterns), psychological traits (mental health, eating disorders), and gut-microbiota into a combined interpretation (3-6). The aim of this scoping review is to explore the literature on multicomponent (bio)markers related to obesity risk, mapping the current state of knowledge while identifying gaps and potential ways forward. It focuses on studies and strategies combining at least two markers from diverse fields, such as nutrition, PA, and multi-omics, to predict the risk of developing overweight or obesity.

METHODS

This scoping review is part of the EU Horizon HealthyW8 project. The review adheres to the PRISMA-ScR guidelines. Four major databases (PubMed, Embase, Scopus, and CINAHL) were searched without language restriction until January 2024, following a pre-published protocol (7). After a two-stage screening process done by individual reviewers, data were extracted using a standardised, predefined and pretested coding scheme.

RESULTS

The search identified 1927 records with N=296 articles meeting the inclusion criteria. These were grouped into marker combinations including 1) diet (in 273/296 articles); 2) PA (in 194 articles); 3) omics (in 67 articles); 4) genetics (in 52 articles); 5) traditional markers (in 120 articles); 6) mental health (in 116 articles). Most common combinations of (bio-)markers were: Diet, PA and mental aspects (n=58 articles), diet, PA and any other marker (n=48), diet, omics & any other marker (n=43) and any combination of 4 markers (n=43). Studies incorporating >3 components exhibited the highest proportion of statistically significant findings relative to the total articles within this group (0.90).

CONCLUSIONS

We explored, mapped, and summarized approaches in multi-model biomarkers related to obesity prediction, allowing for a more holistic understanding of obesity's complex nature. Multi-modal (bio-)markers are promising strategies in future obesity prediction approaches.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_070

FOOD INSECURITY AND ADIPOSITY RISK AMONG YOUNG ADULTS LIVING IN URBAN SLUMS IN A METROPOLITAN CITY IN GHANA

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BACKGROUND AND OBJECTIVES

Urban slums are densely populated areas facing significant health and nutrition challenges. A primary concern is the coexistence of food insecurity and an increased risk of obesity among adults. Limited access to affordable, high-quality food leads to reliance on energy-dense, nutrient-poor diets, raising the risk of obesity and related non-communicable diseases like diabetes and cardiovascular diseases. The study sought to examine the link between food insecurity and obesity risk, along with lipid profiles, in young adults in urban slums, to assess their impact on body composition and metabolic health.

METHODS

A cross-sectional study involving 200 young adults aged 18 to 49 was conducted in three urban slum communities in a metropolitan city in Ghana. A structured questionnaire was used to gather socio-economic information and food insecurity status was assessed using the Household Food Insecurity Access Scale (HFIAS). Anthropometric measurements, including Body Mass Index (BMI), Waist Circumference (WC), Waist-Hip Ratio (WHR), and Mid-Upper Arm Circumference (MUAC) were taken. Body composition metrics such as body fat percentage, visceral fat, and muscle mass were evaluated with Bioelectrical Impedance Analysis (BIA). Additionally, venous blood samples (5 mL) were collected for lipid profile analysis. Data was analyzed using SPSS version 27, and the relationships between adiposity indicators and food insecurity were examined with Chi-square tests and regression models.

RESULTS

The study found that 42% of participants were at high risk for adiposity, with females showing a significantly higher risk than males (39.5% vs. 3.0%, $p<0.05$). Females also had higher rates of overweight (22.5%) and obesity (23.5%) compared to males (10% and 4%). Additionally, 32.5% of females had elevated waist circumference, and 36% had a high waist-to-hip ratio, indicating a greater prevalence of central obesity. In lipid profile analysis, 55.7% had normal HDL levels, while 71.7% were at moderate coronary risk. Elevated LDL and triglycerides were significantly linked to increased adiposity risk ($p<0.05$). No significant correlation was found between food insecurity and high adiposity risk (adjusted odds ratio = 0.090; $p = 0.078$).

CONCLUSIONS

The findings show a high prevalence of excess body fat and lipid abnormalities among young adults in urban slums, particularly among women. Significant differences in body fat risk highlight the need for targeted interventions to improve nutritional awareness, promote healthy lifestyles, and address socioeconomic barriers contributing to these health issues.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_071

EVALUATION OF SALT CONSUMPTION AMONG DIABETICS: DIETARY SURVEY VS NATRIURESIS

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BACKGROUND AND OBJECTIVES
Excessive salt intake is a major risk factor for hypertension and cardiovascular complications, especially in diabetic patients. Accurate assessment of salt consumption is crucial for tailoring dietary recommendations and improving management.
Objective
To compare the effectiveness of dietary surveys and natriuresis measurement in evaluating salt intake among diabetic patients.

METHODS
106 type 2 diabetic patients consulting the National Institute of Nutrition and Food Technology in Tunis were recruited. Urine samples were collected to determine salt intake as predicted by natriuresis. Dietary intake was also assessed using food surveys.

RESULTS
The mean age of the population was 55.46 ± 7.51 years, and the salt intake predicted by natriuresis was 6.22 ± 3.73 g/day, with 4 patients having excessive salt consumption. The 24-hour natriuresis was 106.45 ± 63.82 mmol/24h for the total population, 114 ± 74.7 mmol/24h for men, and 99.63 ± 52.45 mmol/24h for women. Salt intake predicted by natriuresis was 6.22 ± 3.73 g/day for the total population, 6.66 ± 4.36 g/day for men, and 5.82 ± 3.06 g/day for women. The glomerular filtration rate (GFR) was 109.65 ± 35.73 ml/min for the total population, 109.94 ± 31.79 ml/min for men, and 109.4 ± 39 ml/min for women. 3% of the population had a sodium intake greater than 2000 mg/day. The median sodium intake was 4385 mg/day, with a range from 296 to 7899 mg/day.

CONCLUSIONS
Monitoring and adjusting salt intake could be crucial for improving patient outcomes, particularly in diabetic individuals.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_072

ADVANCING OBESITY TREATMENT IN THE UNDERSERVED

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BACKGROUND AND OBJECTIVES

Disparities in obesity and related cardiometabolic disease prevalence and treatment are widespread. Driven in-part by social determinants of health (SDOH), there is also limited access to intensive lifestyle programs that address these factors in underserved, diverse populations. These disparities are evident in Los Angeles where the average obesity rate is 28.5%, but in one sample safety net hospital the rate is 48% for those seen in primary care with 11% having class III obesity (BMI>40 kg/m^2) and 53% reporting food insecurity. Few interdisciplinary lifestyle programs have been studied for their feasibility and effectiveness in this population which this study aims to do.

METHODS

A pilot interdisciplinary weight management program was started for patients with obesity and cardiometabolic disease (diabetes, hypertension, hyperlipidemia). Patients participated in 12 in-person group medical visits over 6 months led by a team of kinesiologists, dieticians, physicians, and social workers. Visits focused on exercise, nutrition, and lifestyle medicine instruction with adjunctive medications if clinically indicated. Patients underwent monitoring of metabolic comorbidities, including HbA1C, SBP, and LDL-cholesterol along with BIA body composition (waist circumference, fat and skeletal muscle mass). Patients also completed pre/post surveys including the CHIS dietary screener and WHOQOL-BREF for quality of life.

RESULTS

A total of 68 patients aged 20-75 years old (average 49), 82% of whom identified as Latino were enrolled in the first year of the pilot clinic. Out of the 12 visits, patients attended an average of 60% of the visits, with transportation, work schedule, and illness as the most common barriers to attendance. The average quality of life rating improved as did dietary quality across many categories such as fresh fruit intake. The majority of patients achieved clinically meaningful improvements with a total percent weight loss average of 6.3% (-17.6%, +1.9%) and average reductions in HbA1C and LDL of 0.5 and 11.7 respectively.

CONCLUSIONS

Patients in the safety net have higher rates of obesity and related cardiometabolic disease along with poor health outcomes and quality of life. They also have limited access to treatments that have been proven to be successful. These preliminary RESULTS show that interdisciplinary weight management programs can be successfully implemented in an underserved setting and lead to improved cardiometabolic health along with improved dietary quality and quality of life. The program can serve as a model for broader implementation to mitigate health disparities in under resourced settings.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_074

APPLICATION OF A POSITIVE DEVIATOR APPROACH TO THE NATIONAL DATASET ON OBESITY AND NUTRITION-RELATED CARDIOMETABOLIC DISEASES IN THE UNITED STATES (US)

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BACKGROUND AND OBJECTIVES
Type 2 diabetes (T2D) and hypertension (HTN) present a major public health challenge worldwide. The prevalence of obesity is >40% among adults in the US, contributing to high prevalence of T2D and HTN. Prevention and mitigation of obesity, T2D, and HTN can alleviate the burden of diseases and premature deaths and yet, every country struggles to address these challenges. This warrants exploration of novel strategies. Positive deviance approach has long been used in nutrition—mostly in the context of undernutrition. We applied this approach in the context of obesity and nutrition-related cardiometabolic diseases.

METHODS
We used the Center for Disease Control and Prevention PLACES dataset (Greenlund et al, 2022) and the census data from the American Community Survey to identify positive deviator (PD) census tracts who had much lower prevalence in 2020. We ran multilevel multivariable regression models to assess association between median household income levels and prevalence of obesity, T2D, or HTN, adjusting for age and racial/ethnic composition at the census tract level and state-level clustering. We identified PD census tracts who had extremely low residuals in the fully adjusted models for each outcome. We assessed preventive care practice and behavioral factors.

RESULTS
Out of 60,945 census tracts, we identified 6 PDs from T2D and 7 each from obesity and HTN from 8 states. There were 3 census tracts that deviated in two of the conditions and 1 census tract that deviated in all three conditions. Among these 4 census tracts, two had relatively low median household income levels (21,624 and 39,041USD). Both of these census tracts had similarly higher proportions of older women and older men's visiting clinics for core preventive services and routine dental care in comparison to the matched census tracts. However, other factors like insurance status, general routine care and sleeping <7 hours were more variable.

CONCLUSIONS
The identification of only 7 PD census tracts highlights that obesity, T2D, and HTN are pervasive issues across the US. While common practice of routine care among older populations may have contributed to this deviation, thorough evaluation of policies, the built environment, and other environmental risk factors in these PD census tracts is essential to uncover the factors contributing to such low prevalences. Insights from these evaluations could inform strategies to adapt and replicate these conditions more broadly in the US.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_075

MEDITERRANEAN DIETARY PATTERN AND BEHAVIOURAL INTERVENTION IN A NEW ZEALAND POPULATION AT INCREASED CARDIOMETABOLIC RISK: WHOLE OF HOUSEHOLD DATA; HE ROUROU WHAI PAINGA

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BACKGROUND AND OBJECTIVES
Cardiometabolic disease including type 2 diabetes and cardiovascular disease (CVD) is common in New Zealand. Dietary patterns including the Mediterranean diet (MedDiet) are associated with a reduced risk of CVD. Study objectives a) test a New Zealand food-based Mediterranean diet (NZMedDiet) in a whole household, and b) characterise household participation.

METHODS
This was a randomised, controlled, multi-centre trial comparing 12 weeks of NZMedDiet to usual diet in participants with increased CVD risk. In a novel design household members were included in the intervention and measurements. The NZMedDiet group was provided with food, recipes and behavioural change support. The primary outcome measure after 12 weeks was the metabolic syndrome severity score (MetSSS) and secondary outcomes were quality of life (QoL, SF36); body composition; HbA1c, lipids and Mediterranean diet score (PyrMDS).

RESULTS
Two hundred adults from a non-Mediterranean, multi-ethnic population took part along with at least one and up to 5 other members of their household (259 household members, total n = 459). At baseline 22 household members were aged under 11; 75 aged 11 – 24; and 162 aged 25 – 81. Household members completed questionnaires and 132 consented to blood sampling.
At the end of 12 weeks, there was no significant difference in mean MetSSS between the NZMedDiet and the usual diet group with an estimate (95% CI) of the difference between groups 0.03 (-0.06 to 0.13) p=0.5. None of the individual components of the MetSSS were different between groups at the end of 12 weeks. The difference in diet score between the NZMedDiet and control favoured a more Mediterranean dietary pattern at 12 weeks ($p<0.001$). This was driven by small increases in fish, fruit, legumes, olive oil, vegetables and nuts. Weight reduced in the NZMedDiet group compared with control (-1.0 (-1.7 to -0.3) p = 0.004) and QoL, assessed by the SF-36 quality of life questionnaire, improved in eight of ten domains ($p< 0.05$).

CONCLUSIONS
There was no improvement in the MetSSS in response to the NZMedDiet intervention over 12 weeks, despite moving to a more Mediterranean dietary pattern. However, there was a significant improvement in quality of life with the NZMedDiet across the whole household, and a small reduction in weight.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_076

THE METABOLITE RISK SCORE AS AN AUXILIARY MOLECULAR DIAGNOSTIC TOOL FOR OBESITY TO COMPLEMENT ANTHROPOMETRIC STANDARDS

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BACKGROUND AND OBJECTIVES
The primary method for diagnosing obesity is the anthropometric measurement of body mass index (BMI). However, BMI does not account for body fat distribution and fat mass, which are more physiologically relevant factors of obesity. Therefore, this study aimed to investigate whether the metabolite risk score (MRS) can effectively diagnose obesity and serve as a useful molecular diagnostics tool for obesity in Korean population.

METHODS
A total of 100 plasma samples were used in the discovery phase to construct the MRS, with 50 samples from individuals without any diseases and the remaining 50 from obesity patients. An additional 100 plasma samples, categorized in the same manner as the discovery set, served as an independent validation set to assess the efficacy of the MRS. Metabolomics was performed using ultra/high-performance liquid chromatography-tandem mass spectrometry (UHPLC-MS/MS), and key metabolites were identified through statistical screening. The MRS was then calculated using the equation $\sum \beta i \mathrm{M}i$, where βi indicates the beta coefficient from a linear regression model incorporating the key metabolites, and Mi indicates the z-score of each key metabolite.

RESULTS
A total of 197 metabolites were identified in the discovery set. Among them, 12 metabolites showed variable importance in projection (VIP) scores greater than 1.5 and a false discovery rate (FDR)-adjusted p-value of less than 0.05. These metabolites were further examined for their potential in diagnosing obesity, with bilirubin and oleic acid emerging as key metabolite for this purpose. The MRS for obesity was calculated using these two metabolites using the equation, $\sum \beta i \mathrm{M}i$. When the MRS was applied to the validation set to evaluate its potential as a molecular diagnostic tool for obesity, it demonstrated an accuracy of 74.8% (p=0.005). Furthermore, when the MRS was combined with established general markers related to obesity, such as systolic blood pressure, tumor necrosis factor-α, and interleukin-6, the accuracy increased up to 81.6% (p <0.001).

CONCLUSIONS
The MRS is a scoring system that uses key metabolites associated with a specific phenotype of interest, in other words the MRS takes into account the collective effects of metabolites rather than focusing solely on identifying the most effective metabolite biomarker. This approach could advance molecular diagnostics methods for obesity, addressing the limitations of current obesity evaluation standards. Ultimately, this study demonstrates that the MRS can serve as a valuable adjunct in molecular diagnostics for obesity in Koreans.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_077

THE POTENTIAL OF WEDANG UWUH EXTRACT AS ANTICANCER OF MCF-7 BREAST CANCER CELL IN VITRO

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BACKGROUND AND OBJECTIVES
Breast cancer is a major non-communicable disease with a sizable cause of death in the world. Wedang uwuh has been widely used by the community as a traditional drink that is beneficial to health. The ingredients in wedang uwuh are known to contain high antioxidants that have the potential to prevent cancer. Several studies have shown that the active compound components contained in wedang uwuh material have anticancer activity. However, research related to the anticancer activity of the combination of wedang uwuh ingredients has never been conducted. The purpose of this study is to determine the potential of wedang uwuh extract as an anticancer agent against MCF-7 breast cancer cells in vitro.

METHODS
This study is an experimental study that uses post-test only with the control group design method. The antiproliferation test was carried out on MCF-7 breast cancer cell culture using the MTT test method. Apoptosis tests were performed on MCF-7 breast cancer cells that had been incubated for 24 hours with the test compound (doxorubicin as a positive control) and analyzed using flow cytometry with the addition of Annexin-V FITC.

RESULTS
The RESULTS showed that wedang uwuh extract had an antiproliferation effect in vitro against MCF-7 breast cancer cells by 50% at a concentration of 3489.594 µg/mL. Wedang uwuh extract can also induce apoptosis in MCF-7 breast cancer cells by 12.6% and 17.4% respectively at concentrations of 872.39 µg/mL (¼ IC_{50}) and 1744.797 µg/mL (½ IC_{50}).

CONCLUSIONS
Base on the result, this study can be conclude that Wedang Uwuh extract have potent as anticancer of breast cancer in vitro

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_078

TRAJECTORIES OF ENERGY FROM MACRONUTRIENTS AND SUBSEQUENT RISK OF OVERWEIGHT/OBESITY AMONG CHINESE ADULTS: A 28-YEAR FOLLOW-UP STUDY

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BACKGROUND AND OBJECTIVES
Overweight and obesity is becoming a major public health problem in China.This study aimed to explore the trajectories of energy from macronutrients and investigate their prospective associations with overweight and obesity among Chinese adults.

METHODS
We used data of the China Health and Nutrition Survey (CHNS) conducted in 1991, 1993, 1997, 2000, 2004, 2006, 2009, 2011, 2015, and 2018. Adults aged 18 and above years were included in the present analysis, for whom dietary data was collected during at least three waves. The total number of participants was 9428. We assessed dietary energy intake by applying three consecutive 24 h dietary recalls (two weekdays and one weekend day) in each wave of the survey. Body mass index (BMI) was calculated using height and weight measurements. Overweight/obesity was defined as BMI ≥ 24 kg/m2. We used group-based trajectory modeling to identify trajectories of energy from macronutrients between 1991 and 2018. The number of groups was determined based on their interpretability and using the Bayesian information criterion (BIC) approach. We constructed three-level mixed-effect logistic regression models to assess the risk of overweight/obesity in relation to trajectories of of energy from macronutrients.

RESULTS
Three trajectories groups of energy from macronutrients were identified. Participants who followed the low-carbohydrate high-fat high-protein diet trajectory (OR = 1.28; 95% CI: 1.08, 1.52) were positively associated with higher risk of overweight/obesity after adjusting for potential confounding factors. Participants with high-carbohydrate low-fat low-protein diet trajectory were not associated significantly with overweight/obesity.

CONCLUSIONS
Macronutrient intake is inextricably linked to health and diets of different proportional macronutrients can have profound implications for obesity prevention.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_079

KNOWLEDGE, ATTITUDES, AND PRACTICE OF LOW SODIUM SALT IN 9 PROVINCES IN CHINA: A NATION-WIDE COMMUNITY-BASED SURVEY

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BACKGROUND AND OBJECTIVES
Substituting regular salt with low sodium salt (LSS) is an effective strategy for reducing blood pressure and preventing cardiovascular events. This study aims to investigate the knowledge, attitude, and practice (KAP) of Chinese consumers on salt reduction and low-salt diets, analyze the influencing factors of buying low sodium salt, provide feasible suggestions and technical support for the intake and promotion of low salt diet in China, and provide reference recommendations for the government.

METHODS
This multi-center nationwide survey was conducted from April 2023 to July 2023 in nine provinces in China, utilizing a multi-stage stratified sampling method. The survey was using the Knowledge Attitude Practice (KAP) questionnaire about salt reduction and low sodium salt, and the counting data were described in the form of number of cases (percentage), and the comparisons between two and more groups were made using the c2 test. Logistic regression modeling was used to explore the relationship between KAP and different characteristics of salt reduction and low sodium salt. The correlation between reduced salt and low sodium salt KAP was analyzed by Pearson correlation coefficient.

RESULTS
A total of 5534 valid questionnaires were collected. In the KAP of salt reduction, the awareness rate of "5g daily salt intake for adults" was 29.6%. 4,695 (84.8%) supported the low-salt diet, 74.5% of the participants took salt reduction measures. The main factors affecting the KAP score of salt reduction were gender, age, educational background, frequency of meals at home and food taste. In the KAP of low sodium salt, the LSS knowledge rate was 57.9%. The proportion of consumers who bought LSS was 77.5%. Among those who are aware of low sodium salt, more than 80 percent of respondents supported the use of LSS instead of regular salt by food and beverage companies. The factors influencing the KAP score of low sodium salt included gender, residence, monthly family income and the frequency of meals at home.

CONCLUSIONS
We found that better salt reduction knowledge and attitude can encourage consumers to take the initiative to reduce salt intake. However, there are still several challenges in promoting LSS. Further progress on LSS would require multi-party cooperation, strengthened health education, and further cultivation of consumers' awareness of low salt and low sodium habits.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_080

IDENTIFICATION OF ANTIOXIDANT ACTIVITY AND BIOACTIVE COMPOUND IN COMMERCIAL WEDANG UWUH, A TRADITIONAL BEVERAGE IN INDONESIA

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BACKGROUND AND OBJECTIVES
Non-Communicable Diseases (NCDs) develop in a state of oxidative stress that can damage the human body. The antioxidant content in functional foods plays a role in handling oxidative stress. Wedang uwuh which contains several kinds of spices with various bioactive components has the potential as an antioxidant that is good for health. Differences in composition and quantity in some commercial wedang uwuh have the potential to cause differences in antioxidant activity content. This study aims to determine the antioxidant activity of several commercial wedang uwuh and identify the quercetin compounds of selected commercial wedang uwuh.

METHODS
This study was conducted using laboratory experimental analysis method, with the analysis of antioxidant activity in the five types of wedang uwuh infused samples carried out using the DPPH method and the identification of quercetin compounds in selected samples using the HPLC method.

RESULTS
The infusion of wedang uwuh in each sample had an average antioxidant activity in the form of a percent DPPH radical scavenging ability of 67.28%; 59,5%; 64,67%; 63,48%; and 65.34%. Selected commercial wedang uwuh infusion contain the quercetin compound of 22.81 ppm.

CONCLUSIONS
B*ase on the result can be concluded that commercial wedang uwuh have antioxidant activity and the higest antioxidant activity of wedang uwuh contain quercetin.*

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_081

EFFECT OF THE CONSUMPTION OF MILK WITH BETA-CASEIN A2A2, MILK WITH BETA-CASEIN A1A2 AND A PLANT-BASED DRINK ON METABOLIC HEALTH IN ADULTS. RANDOMIZED CONTROLLED IMPA-CT: PROTOCOL STUDY

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BACKGROUND AND OBJECTIVES
Milk with A2 β-casein (A2 milk) is currently the subject of numerous studies on the effects of its consumption on health. Commonly consumed milk contains a mixture of β-casein of different genetic variants (most often A1 and A2). In the polypeptide chain of A2 β-casein, proline occurs at position 67, while in β-casein A1 - histidine. Main goal of the dietary intervention will be to identify and compare the effects of consuming A2 milk, conventional milk and cow's milk substitute(s) (selected plant-based drink) on body composition, parameters of carbohydrate and lipid metabolism, metabolic rate and immune system function, and markers of bone turnover in adults.

METHODS
The controlled IMPA-CT (Investigating Milk and Plant Alternatives-Clinical Trial) Study is an observational, prospective and randomize study with three groups (A2Milk group, ConvMilk group, and PlantDrink group). The study will include 150 adults with normal and/or overweight, without coexisting chronic diseases, aged 20-60 years. The intervention study will consist of the consumption of at least 250 ml of an appropriate product (A2 milk / convmilk / plant drink) daily for a period of 3 months. After qualification of the subjects (T0), before the start of the study (T0'), in the 4th week of the study (T4), in the 8th week of the study (T8) and at the end of the study, after 12 weeks (T12), an assessment of the diet and nutritional status is planned. Body composition, bone mineral density (DEXA) and biochemical tests will be done as a marker of metabolic health, as well as an assessment of the metabolic rate (RMR) will be performed.

RESULTS
We expect that after 12 weeks the effect of consuming A2 or conventional milk or plant drink will be visible in markers of metabolic health such as: lipid profile, insulin and postprandial glycemia, IGF-1, IGFBP-3; casein allergy marker - sIgE; markers of immune system function - IL-2, IL-6, IL-10, TNF-α (tumor necrosis factor); immunoglobulins: IgA, IgG; bone turnover markers: including: beta-Crosslaps (beta-CTX), bone resorption marker - telopeptide - of type 1 collagen (CTx); bone formation markers - procollagen type 1 propeptide (P1NP), bone alkaline phosphatase isoenzyme, P1CP). Additionally, urinary calcium; pyridinoline (Pyr) and deoxypyridinoline (DPyr) will be assessed.

CONCLUSIONS
The study design, including extensive follow-up and robust endpoint measures, will contribute to understanding the therapeutic potential and safety profile or otherwise of β-casein A2 milk and plant-based drinks.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_082

LOW CONSUMPTION OF FISH, FERMENTED MILK BEVERAGES AND PLANT BIOACTIVE COMPONENTS MAY BE THE PREDICTORS OF RISK OF MORE SEVERE FORMS OF METABOLIC SYNDROME (METS)

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BACKGROUND AND OBJECTIVES
Diet-therapy of Metabolic Syndrome (MetS) and your components is of great importance due to significant health and social consequences. The aim of this study was to (1) determine dietary patterns (DPs) and (2) determine the association between selected plasma antioxidants (carotenoids, polyphenols) and the severity of MetS and MetS components in Polish adults with metabolic disorders.

METHODS
The study was designed as a cross-sectional. The study group was 276 adults with metabolic disorders. Data about the frequency of consumption of selected food groups were collected. Anthropometric measurements: body height, body weight, waist, and hip, as well as body composition were taken. Blood samples were obtained for measurements of glucose and lipids, as well as carotenoids and polyphenols. The obtained biochemical and anthropometric parameters were used to calculate the anthropometric and metabolic dysfunction indices.

RESULTS
Three dietary patterns were identified in our study group: Western, Prudent and Low Food. RESULTS of logistic regression analysis indicated rare consumption of fish and fermented milk beverages as a predictor of risk of more severe forms of MetS. In our study group, no relationship was found between the dietary antioxidant intensity and the variables studied, which may be attributed to the low frequency of consumption of the sources of bioactive compounds, such as carotenoids and polyphenols, but also to the metabolic disorders. A low concentration of carotenoids and polyphenols in the plasma of adult with MetS was associated with an improper diet with a low consumption of plant products, including vegetables and fruit.

CONCLUSIONS
In the treatment of MetS, the development of effective strategies to reduce the risk of more severe forms of MetS should focus on increasing the consumption of fish, fermented milk beverages, and vegetables and fruits. Further studies are needed to determine whether the observed associations and low plasma levels of antioxidants are causally related to the metabolic syndrome or are a result of the pathology of the syndrome or an inappropriate diet.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_083

DEVELOPING EVIDENCE-BASED PUBLIC HEALTH GUIDANCE ON DIET AND RELATED FACTORS FOR PEOPLE LIVING WITH AND BEYOND CANCER

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BACKGROUND AND OBJECTIVES

The global burden of cancer is increasing due to a growing and aging population alongside increasing lifestyle-related risk factors. Concurrently, enhanced and early detection of cancer along with improved treatment has resulted in greater numbers of people living with and beyond cancer (LWBC) globally. This has increased demand from health professionals and people LWBC for reliable evidence-based information about diet and other lifestyle factors. World Cancer Research Fund (WCRF) International's Global Cancer Update Programme aimed to fill this gap with evidence-based guidance developed by experts.

METHODS

WCRF International worked with experts who first judged the strength of the available evidence [1,2,3] on how diet, nutrition and physical activity influence survival and quality of life in people after a diagnosis of colorectal and breast cancers. Evidence was graded using pre-determined criteria designed to judge the certainty of an effect from exposure to a particular risk factor [4]. Due to nature of the limitations in the cancer survivorship literature, it was necessary to take a different approach, so we worked with experts (scientists, health professionals and patients) to develop a new framework for producing guidance [5,6]. This guidance considered the unique complexities of the cancer survivorship evidence compared to incidence and was a way of providing public health information in areas where evidence is weaker based on the judgement criteria. Recommendations for future research were also developed.

RESULTS

A substantial amount of research was included in the reviews. As this came mainly from observational studies, residual confounding and reverse causation could not be excluded. Guidance was developed to encourage people LWBC to consider making specific lifestyle changes. For diet, this included increasing dietary fibre (breast cancer) and increasing wholegrains and coffee, and reducing sugary drinks (colorectal cancer). The findings also provided confirmation that following WCRF International's existing Cancer Prevention Recommendations is likely to be beneficial for this group.

CONCLUSIONS

There is increasing evidence on the role of lifestyle for people LWBC but there were limitations in the strength of the evidence. Working with experts allowed us to develop guidance representing the best currently available evidence, this can be used by patients, health professionals and policy makers to improve cancer care.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_085

THE POTENTIAL OF A SUSTAINABLE INNOVATIVE PREBIOTIC AS A CO-TREATMENT TO METFORMIN IN THE MANAGEMENT OF TYPE 2 DIABETES

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BACKGROUND AND OBJECTIVES
Type 2 diabetes (T2D) patients are often treated with metformin, the most widely used oral glucose lowering agent. However, the adherence to the treatment is usually poor with gastrointestinal complaints and gut dysbiosis as a major cause. The intake of prebiotics promotes the growth of health-beneficial bacteria and could thus help to prevent gut dysbiosis. In this study, we investigated the potential of arabinoxylan-oligosaccharide rich fibre extract (AXOS), an innovative sustainable prebiotic, to co-treat T2D thereby improving gut health and increasing adherence to metformin.

METHODS
A blinded, parallel, randomised, controlled 4-month intervention study in T2D patients taking metformin was carried out to investigate the effect of AXOS on glucose metabolism and gut health. AXOS from maize was produced from a side stream from the ethanol industry, which is very cost-effective and sustainable process. The soluble fibres were extracted and treated by unique enzymes to yield AXOS. A daily of 10g of AXOS or control (maltodextrin) was consumed. At the start, month 2 and month 4 of the study, blood samples were collected for measurement of clinical markers and fecal samples for gut microbiota analysis. Intestinal microbial community analysis was performed by high-throughput NGS of 16S rRNA and quantitative PCR (Bifidobacterium spp, F. prausnitzii, P.copri). The “Fibre loving bacteria (FLB) index” was calculated based upon short chain fatty acid levels.

RESULTS
Sixty-six T2D patients started and 54 (72±5y, 27±4 kg/m2; n=27 AXOS, n=27 control) completed the study. Mean fasting glucose, insulin, HbA1c, blood lipid levels, vitamin D and vitamin B12 did not significantly change during the study ($p>0.05$). The PCR RESULTS showed that 20% of patients who consumed AXOS had an upregulation of the FLB index together with increased level of HBA1c ($p=0.08$).

CONCLUSIONS
AXOS show the potential to improve gut microbial composition in patients with T2D taking metformin. However, more research is needed to confirm these RESULTS and to further explore the interindividual differences to be able to develop sustainable personalized prebiotics targeted for T2D patients taking metformin.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_086

PULMONARY FUNCTION IN RELATION TO THE ADEQUACY OF TOTAL DAILY PROTEIN INTAKE IN MIDDLE-AGE PATIENTS WITH COPD

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BACKGROUND AND OBJECTIVES
Chronic obstructive pulmonary disease (COPD) is often linked to nutritional depletion, adversely impacting outcomes. Alongside with the daily energy intake, an adequate protein intake is essential for COPD patients. The present study observed the differences in weight status, skeletal muscle index, respiratory function and inspiratory muscle strength and function between patients with stable COPD toward daily protein intake.

METHODS
The cross-sectional study was conducted on 71 COPD patients (53.3% men; 66.5 ± 8.4 years) participating in pulmonary rehabilitation (September 2023 – May 2024). Dietary intake was determined using three 24-hour recalls. Patients were divided into two groups according to the British Dietetic Association recommendation for protein intake in stable COPD (0.8 – 1.5 g/kg/day). The first group consists of patients who had protein intake less than 0.8 g/kg/day (NMR group), and the second group consists of patients who had an intake of more than 0.8 g/kg/day (MR group). Anthropometric measurements, respiratory function and inspiratory muscle function and strength were assessed according to standard protocols.

RESULTS
Overall, 47.8% of patients did not meet the recommended protein intake (NMR: 0.59 ± 0.13 g/kg), while of the remaining 37, 34 met the recommendations and 3 exceeded them (MR: 1.08 ± 0.28 g/kg). The MR group had a higher daily energy intake (1724 ± 390 kcal vs. 1317 ± 305 kcal; $p<0.001$) compared to the NMR group. In the MR group, patients had a higher proportion of daily energy from proteins, while there were no significant differences in fats and carbohydrates. The majority ($p<0.001$) of patients in the MR group had an adequate weight status (67.6%), while in the NMR group 50.0% of patients were obese. No difference was found between the groups in the proportion of patients with an adequate skeletal muscle mass index. In addition, no significant differences were observed in FEV1, FVC, or MIP between groups. However, the MR group exhibited lower diaphragm thickness at the end of inhalation (2.3 ± 0.5 mm vs. 2.6 ± 0.6 mm; $p<0.001$) and exhalation (1.6 ± 0.5 mm vs. 2.8 ± 0.5 mm; $p<0.001$).

CONCLUSIONS
Nearly half of the patients did not reach the recommended protein intake, emphasizing the need for targeted nutritional and functional assessment and support. The MR group had better energy balance and weight status, but had lower diaphragm thickness, which warrants further investigation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_088

EVALUATION OF GLUTEN-FREE DIET BALANCE IN PATIENTS WITH CELIAC DISEASE

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BACKGROUND AND OBJECTIVES
Celiac disease (CD) is a condition for which the only current therapeutic solution is a strict gluten-free diet (GFD). The nutritional profile of gluten-free foods has been increasingly questioned by the scientific community. It seems crucial to ensure not only that gluten is excluded from the diet, but also that it is properly balanced. Our study aimed to assess habitual intakes of energy, macronutrients, vitamins, and minerals in patients with CD and the extent to which these cover recommended dietary allowances (RDA).

METHODS
A total of 60 participants, 40 of whom (32 women, 8 men, mean age = 36.19) were diagnosed with CD and had followed the GFD for an average of 10.2 years, and 20 healthy people (16 women, 4 men, mean age = 36.22) stated the control group (CG) and followed the traditional diet.
Participants were asked to follow their usual diet to assess intakes of energy, carbohydrate, protein, fat, fibre, potassium (K), sodium (Na), calcium (Ca), phosphorus (P), magnesium (Mg), iron (Fe), zinc (Zn), vitamin A, B1, B3, B6, B12. Furthermore, the extent to which participants covered the RDA was evaluated. Dietary intake was assessed by 4-day food records analysed (Diet 6.0, Poland).

RESULTS
There were significant differences in the intake of fiber (16.6 vs. 20.51 g/day), Na (2151.46 vs. 3275.15 mg/day), Mg (277.55 vs. 331.93 mg/day), Fe (9.185 vs. 11.95 mg/day), vitamin A (1048,223 vs. 322,254 uq/d) between both groups. There were no significant differences in energy, carbohydrate, protein, K, Ca, P, Mg, Zn, vitamin B1, B2, B6, B12, but patients with CD did not meet the RDA for Ca (77.84% RDA), Mg (83.56% RDA), Zn (98.93% RDA), Fe (71.99% RDA), vitamin B1 (87% RDA) and D (17.35% RDA), while controls did not meet the RDA for Ca (88.85% RDA), Mg (96.8% RDA), Fe (83.37% RDA), thiamin (90.44% RDA), vitamin D (20.42% RDA). Despite the lack of statistically significant differences in energy intake, patients with CD presented lower body mass than CG (61.64 vs. 71.15 kg).

CONCLUSIONS
The diet of patients with CD is deficient in Ca, Mg, Fe, vitamin B1 and D. CD patients consume less dietary fibre, Mg and Fe than healthy individuals. This study emphasises the importance of providing appropriate education to patients with CD, which should extend beyond gluten restriction and put more focus on the nutritional value of the diet.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_089

ASSESSMENT OF BODY COMPOSITION IN PATIENTS WITH CELIAC DISEASE IN RELATION TO ENERGY SUPPLY, PROTEIN, FAT AND CARBOHYDRATE INTAKE

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BACKGROUND AND OBJECTIVES
Celiac disease (CD) is a condition characterised by the atrophy of intestinal villi in response to gluten consumption. Following the introduction of a strict gluten-free diet (GFD), except for rare cases of CD refractory to dietary treatment, the intestinal villi are rebuilt, resulting in a more efficient absorption of nutrients. We therefore assessed the differences in body composition between the two groups and investigated whether the GFD of patients with CD differs from that of healthy people in terms of energy and macronutrient balance.

METHODS
We recruited a total of 60 participants, 40 of whom (32 women, 8 men, mean age = 36.19) were diagnosed with CD and followed the GFD for an average of 10.2 years, and 20 healthy individuals (16 women, 4 men, mean age = 36.22) stated the control group (CG) and followed the traditional diet. We examined body composition - body mass, body mass index (BMI), fat-free mass (FFM), % of FFM in soft tissue, fat mass (FM), and % of FM in soft tissue - by dual-energy X-ray absorptiometry (DXA) using the Lunar DPX-Plus (Lunar, Inc. Madison, Wisconsin, USA). Participants were asked to follow their usual diet to assess their intake of energy, carbohydrate, protein, fat, fibre, saturated fatty acids (SFAs), polyunsaturated fatty acids (PUFAs), monounsaturated fatty acids (MUFAs) and cholesterol. Dietary intake was assessed by analysing 4-day food records (Diet 6.0, Poland).

RESULTS
We observed statistically significant differences between patients with CD and CG in body mass (61.58 vs. 71.5 kg), FM (15.92 vs. 23.39 kg), % of FM in soft tissue (25.43 vs. 34.65 %), and % of FFM in soft tissue (72.26 vs. 62.74 %). No statistically significant differences were found for BMI (22.4 vs. 24.18 kg/m2) and FFM (44.08 vs. 46.17 kg). Individuals with CD consumed statistically significantly less fiber (16.16 vs. 20.51 g/d) but showed no significant differences for energy and other dietary components. We observed statistically significant positive correlations between body mass and energy, protein, fat, and fiber intake in CD patients, and in the CG between body mass and protein and fat intake.

CONCLUSIONS
Individuals with CD tend to present lower body mass, FM, and % of FFM in soft tissue, but there are no differences in energy and macronutrient intake. However, patients with CD have been observed to consume less fibre than CG. These RESULTS emphasize the importance of taking a personalized approach to the care of patients with CD, with a focus on developing tailored management plans based on comprehensive health and nutritional interviews and, when possible, body composition measurements.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_090

Associations of body mass index and gut microbiota composition among adults and the role of dietary fiber intake – RESULTS from federated analyses of multiple European observational studies

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BACKGROUND AND OBJECTIVES

Gut microbiota may contribute to the higher disease risk associated with adiposity, but human studies reported inconsistent associations of adiposity with gut microbiota composition, possibly due to between-study heterogeneity. In order to clarify observed inconsistencies, we examined associations of body mass index (BMI) with gut microbiota alpha diversity and relative microbial abundance at the phylum and genus taxonomic level alongside variation in fiber intake among adults in a joint federated analysis of harmonized data from European observational studies participating in the Knowledge Platform Intestinal Microbiomics (INTIMIC-KP).

METHODS

Eight studies harmonized cross-sectional data, including BMI (kg/m2), self-reported dietary intake, and microbiota composition based on high-throughput measurement. Generalized linear models and logistic regression were used in study-level meta-analysis of individual participant data using R-based DataSHIELD. Models were adjusted for age and sex and additionally for fiber and energy intake.

RESULTS

Among 7,415 participants from eight studies, higher BMI (per 5 kg/m2) was associated with lower alpha diversity (β: -0.05; 95%CI -0.07, -0.03) and with higher relative abundance of the phylum Proteobacteria (β: 0.05; 95% CI 0.01, 0.09), but no associations were observed for the phyla Firmicutes and Bacteroidetes, with high between-study heterogeneity. Higher BMI was inversely associated with the relative abundance of *Faecalibacterium* (Firmicutes) (β -0.11, 95% CI -0.14, -0.07) as well as with lower odds of presence of *Blautia* (Firmicutes) and *Akkermansia* (Verrucomicrobia) and when *Akkermansia* was present, with lower *Akkermansia* relative abundance. Adjustment for dietary fiber did not substantially change observations.

CONCLUSIONS

This federated analysis of multiple studies on gut microbiota profiles found lower alpha diversity, higher Proteobacteria relative abundance, alongside depleted *Faecalibacterium*, *Blautia* and *Akkermansia* with higher adiposity. By combining data from diverse study populations using harmonized data and statistical methods, our analysis partly overcomes sources of heterogeneity that may explain previously observed inconsistent findings.

CONFLICTS OF INTERESTS

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EPO6_092

Low polyphenol content is on the pathway between ultra-processed food consumption and low-grade inflammation: cross-sectional RESULTS from the Moli-sani Study

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BACKGROUND AND OBJECTIVES
Low-grade inflammation is one of the potential mechanisms linking ultra-processed foods (UPFs) to poor health outcomes. Besides having low nutritional composition, UPFs also lack bioactive compounds, such as polyphenols. We tested the hypothesis that low polyphenol content could be on the pathway of the previously documented association between UPFs and low-grade inflammation.

METHODS
Data were from the Moli-sani Study established in 2005–2010, and comprising 22,939 men and women (mean age 55 y ± 12). Dietary data were collected using a 188-item food frequency questionnaire, and polyphenol intake was calculated by matching food consumption data with the Phenol-Explorer database on the polyphenol content of each reported food. UPF was defined according to the Nova classification, and calculated as the proportion (weight ratio; %) between UPF (g/d) and the total food eaten (g/d). Low-grade inflammation was assessed by a composite INFLA-score including C-reactive protein levels, leukocyte and platelet counts and the granulocyte to lymphocyte ratio.

RESULTS
The average (SD) weight contribution of UPFs to the diet was 10.8% (±6.7), the mean intake of polyphenols was 449 (±218) mg/d. In multivariable-adjusted linear regression analyses, higher UPF intake (Q4) was associated with lower dietary polyphenol content (β = -149.5; 95% CI: -156.3 to -142.8 mg/d), compared to the bottom category, and this inverse association was consistent for main polyphenol classes. The inclusion of total dietary polyphenols into the multivariable model explained about 20% of the direct relationship of UPFs with the INFLA-score (p-value < 0.001), and this association was particularly evident for lignans (proportion explained = 38.1%; p-value <0.001).

CONCLUSIONS
A higher dietary share of UPFs would provide lower amounts of polyphenols in the diet. The poor polyphenol content of highly processed foods explains a good proportion of the direct association of UPFs with low-grade inflammation. These findings suggest that reducing UPFs could possibly increase the amount of polyphenols in the diet and contribute to lower inflammation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_093

GASTROINTESTINAL SYMPTOMS IMPROVE WITH A MEDITERRANEAN DIETARY PATTERN AND BEHAVIOURAL INTERVENTION IN A NEW ZEALAND POPULATION AT INCREASED CARDIOMETABOLIC RISK; HE ROUROU WHAI PAINGA

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BACKGROUND AND OBJECTIVES
The increase in ultra-processed and western dietary patterns is associated with an increase in gastrointestinal (GI) issues. As GI health is directly impacted by dietary pattern, it is unsurprising that the Mediterranean diet (MedDiet) is associated with positive symptom outcomes in patients with conditions that can impact GI symptoms such as irritable bowel syndrome. However, there are currently limited data on the potential benefits of the MedDiet on GI function in individuals with no diagnosed GI disorders or diseases. The objective was to examine the impact of a New Zealand food-based Mediterranean diet (NZMedDiet) with behavioural intervention on GI symptom severity.

METHODS
This is a multi-centre, randomised control trial, which compared the effects of a 12 week (w) NZMedDiet to usual diet in participants at increased cardiometabolic risk. Household members were also invited to participate with index participants. The NZMedDiet group was provided with food, recipes and behavioural change support. To assess GI symptoms, the Gastrointestinal Symptom Severity Score (GSRS) was provided to participants at 0 and 12w. The GSRS scores are obtained by combining 15 items into 5 symptom clusters; abdominal pain, reflux, diarrhoea, indigestion and constipation. The higher the score of each cluster, the more severe the symptom. Comparisons between groups were made using t-tests.

RESULTS
Two-hundred adults from a non-Mediterranean, multi-ethnic population participated. Baseline mean ages of index participants were 49.8y and 49.9y, in the NZMedDiet and control groups, respectively. GSRS variable scores were compared between groups and the intervention group had a statistically significant reduction ($p<0.05$) in all five GSRS variables compared to the control group. Abdominal pain and diarrhoea were the most significantly improved symptoms in the intervention group, compared to the controls. Furthermore, the index participants tended to have higher baseline GSRS scores compared to the household members in the study, indicating that they had slightly worse GI symptoms in general.

CONCLUSIONS
Although the participants were not considered to have severe GI symptoms at baseline, their severity score had decreased after 12w on the NZMedDiet, indicating its potential benefits in the general GI health of participants. Some of the potential reasons for this benefit are increases in fibre rich foods and their role in shaping the microbiome and reducing inflammation within the gut.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_094

THE IMPACT OF A WEIGHT GAIN OF 10 KG OR MORE AFTER AGE 20 ON THE HEALTH STATUS OF JAPANESE MEN

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BACKGROUND AND OBJECTIVES
In recent years, the health effects of overnutrition have become a problem in Japan. In particular, in middle-aged men, excessive weight gain associated with aging has been strongly linked with the onset of hypertension, dyslipidemia, and diabetes. Therefore, we investigated the extent to which a weight gain of 10 kg or more after age 20 affects health status.

METHODS
The study included 54,908 Japanese men, aged 30 to 69 years, who underwent health checkups at medical institutions in Japan in 2019. They were not receiving medical care. The participants were asked to fill out a questionnaire to determine whether they had a weight gain of 10 kg or more after the age of 20 years to the time of their health checkup. For blood pressure, risk was defined as meeting at least one of the following criteria: a systolic blood pressure of 130 mmHg or higher or a diastolic blood pressure of 80 mmHg or higher. For serum lipids, risk was defined as a high-density lipoprotein-cholesterol concentration less than 40 mg/dL. For glucose tolerance, risk was defined as a fasting blood glucose concentration of 100 mg/dL or higher or HbA1c level of 5.6% or higher. Logistic regression analysis was used to calculate the odds ratios and 95% confidence intervals, adjusted for associated factors for the three risks of having a weight gain of 10 kg or more after age 20, compared with not having a weight gain of 10 kg or more after age 20.

RESULTS
The age composition of the population was as follows: 32.1% in their 30s, 36.0% in their 40s, 21.6% in their 50s, and 10.3% in their 60s. The overall physical condition [expressed as the mean (standard deviation)] was based on age [45.3 (9.8) years], height [171.5 (6.0) cm], weight [69.9 (11.7) kg], and body mass index [23.7 (3.6) kg/m2]. The adjusted odds ratios (95% confidence interval) for individuals who had gained 10 kg or more after age 20, compared with individuals who had not gained weight, were as follows: blood pressure, 1.847 (1.783-1.914); serum lipids, 3.197 (2.984-3.425), and glucose tolerance, 1.801 (1.738-1.866).

CONCLUSIONS
This study confirmed that, in Japanese men, a weight gain of 10 kg or more after the age 20 clearly increases the risk of developing noncommunicable diseases such as high blood pressure, dyslipidemia, and diabetes. For individuals found to have risk factors during health checkups, actively encouraging them to improve their daily eating habits and lifestyle disorders via nutritional and health guidance is necessary.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_095

THE BURDEN OF CARDIOVASCULAR DISEASE ATTRIBUTABLE TO DIETARY RISK FACTORS AMONG FIVE HEALTH AREAS IN CHINA, 2002-2018

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BACKGROUND AND OBJECTIVES
The burden of cardiovascular diseases (CVDs) is rising in China and showed regional difference. Our study is aiming to provide a comprehensive depiction of the burden of CVDs attributable to dietary risk factors across China's five health areas from 2002 to 2018.

METHODS
Data from the China National Nutrition Surveys, the China Chronic Disease and Risk Factor Surveillance, the Hypertension Survey, and the Chinese Centre for Disease Control and Prevention cause-of-death reporting system were used to estimate the intake of dietary factor, the number of deaths, and disability-adjusted life-years (DALYs), age-standardized mortality rate (ASMR), for ischemic heart disease (IHD), ischemic stroke (IS), hemorrhage and intracranial hemorrhage (IH) attributable to dietary factors in China from 2002 to 2018. According to previous studies in China, this study categorizes the 31 provinces into five health areas.

RESULTS
Inadequate fruit, whole grain, and vegetables intake were the leading dietary risk factors for IHD, IS and IH in China, while nuts, soybean and SSB were only associated with IHD mortality. In 2018, low whole grain intake was responsible for the highest CVDs deaths in health area one, two and five, which responsible for 44.0, 148.6 and 49.0 thousand deaths respectively. Low fruit intake was responsible for the highest CVDs deaths in health area three and four, which responsible for 320.0 and 105.7 thousand deaths respectively. From 2002 to 2018, the highest ASMR for CVDs attributable to suboptimal diet was found in health area three and changed from 179.67 to 138.30 per 100 000 population respectively. In 2018, the highest attributable ASMR IHD and IS was found in health area three, which was 77.62 and 30.70 per 100 000 population and the highest attributable ASMR for IH was found in health area four, which was 37.34 per 100 000 population. In 2018, suboptimal diet was responsible for 16.0 million (95%UI, 13.8 to 18.4) DALYs for stroke, and 13.9 million (95%UI, 11.8 to 16.3) DALYs for IHD in China. Health area three had the highest burden of CVDs, accounting for 46.2% and 51.2% DALYs for stroke and IHD in 2018.

CONCLUSIONS
This study provides a comprehensive picture of the geographic variation and temporal trends of the burden of CVDs attributable to dietary risk factors according to health area from 2002 to 2018 in China and showed that low whole and fruit intake were the main dietary risk factors among China, highlighting the need for geographically targeted intervention strategies to improve the quality of diet and reduce the diet-related burden of CVDs.

CONFLICTS OF INTERESTS
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EPO6_096

ASSOCIATION BETWEEN SUCROSE CONSUMPTION AND IMMUNOGLOBULIN PRODUCTION IN WOMEN WITH TYPE 2 DIABETES MELLITUS

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BACKGROUND AND OBJECTIVES
Type 2 diabetes mellitus (T2DM) is a systemic disease. Carbohydrate consumption causes complications in the disease. The role of immunoglobulin production in T2DM is still unclear. The objective was to evaluate the association between sucrose consumption and immunoglobulin production in women with and without type 2 diabetes mellitus.

METHODS
Two groups were included in the study: 1) women with T2DM (n=22) and 2) healthy women without T2DM (n=22). In both groups, the following were determined: body mass index (BMI), total cholesterol, triglycerides, pre- and postprandial glucose, serum concentration of immunoglobulins A, G and M, as well as 2 24-h recalls determining sucrose consumption per week.

RESULTS
In both groups, the mean age was 40 years, 12 with normal weight, 6 with overweight and 4 with obesity. 59% of women with T2DM had elevated cholesterol, triglycerides and serum glucose, in contrast to 40% of women without T2DM who showed elevation in these parameters. Women with T2DM consumed a higher amount of sucrose (4,837 mg per week) in contrast to the group with T2DM (1,876 mg per week). There was a difference in sucrose consumption ($P<0.002$), IgG production ($P<0.001$) and IgM ($P<0.002$), with a significant correlation between age and sucrose consumption with IgG and IgM production in the group with T2DM.

CONCLUSIONS
There is a positive association between sucrose consumption and the modification in the production of IgG and IgM immunoglobulins.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_097

WHICH INTERVENTIONS TO PROMOTE HEALTHY DIETARY AND/OR PHYSICAL ACTIVITY BEHAVIOURS COULD WORK BEST AMONG ADOLESCENTS IN SUB-SAHARAN AFRICA? A REALIST SYNTHESIS

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BACKGROUND AND OBJECTIVES
Like many Sub-Saharan African (SSA) countries, Ghana and Kenya are experiencing a rapid nutrition transition due to unhealthy food environments and decreased physical activity opportunities for adolescents. Effective interventions to promote healthy diet and physical activity among adolescents requires an understanding of the underlying mechanisms that contribute to behaviour change. We aimed to identify programme theories (PTs) that capture key context-mechanism-outcome patterns so as to help pinpoint theoretical components of a multi-component intervention to improve adolescent diet and physical activity in SSA.

METHODS
A realist synthesis was conducted using a 5-stage iterative process. *Stage 1:* a rough PT was generated based on synthesizing 7 relevant WHO best buys on diet and physical activity. *Stage 2:* a search was conducted of 3 academic databases (PubMed, Scopus, and Web of Science) to identify relevant studies for adolescents (10-19y) in urban SSA. *Stage 3:* relevant data were extracted/synthesized to generate evidence-informed context, mechanisms, and outcome configurations (n=63), which contributed to the generation of 10 PTs. *Stages 4 and 5:* PTs were tested/refined using evidence from relevant SSA studies (n=27) and consultations with stakeholders in Ghana/Kenya.

RESULTS
Physical activity and healthy diet interventions are likely to be effective when they operate through 3 interconnected systems: an institutional framework (e.g. schools), environmental enablers and social support networks. Success requires established supportive scheduling [PT1], reinforced by trained and engaged teachers who can effectively implement nutrition and/or physical education [PT2, PT3]. These institutional elements must be supported by adequate environmental enablers, such as accessible physical activity facilities [PT5] and availability of affordable nutritious food options [PT6], with consideration for socioeconomic barriers that might limit access [PT7]. The intervention's impact could then be amplified through a comprehensive social support system where peer influence [PT8], parental engagement [PT9], and community involvement create reinforcing behavioural norms [PT4], while cultural relevance [PT10] ensures sustained participation.

CONCLUSIONS
Multi-component interventions could work by creating a system where institutional support, environmental access, economic access and social reinforcement work in synergy to normalise and facilitate healthy dietary and physical activity behaviors of adolescents.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_099

RISK FACTORS OF CARDIOMETABOLIC HEALTH AND METABOLIC SYNDROME AMONG NON-PREGNANT WOMEN IN LEBANON

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BACKGROUND AND OBJECTIVES

Globally, non-communicable diseases are the leading cause of mortality among women, responsible for two-thirds of all deaths, half of which are due to cardiovascular diseases. We explored the prevalence and risk factors of metabolic syndrome in non-pregnant women aged 15–49 years of age in Lebanon.

METHODS

The prevalence and co-existence of diabetes or prediabetes, hypertension, obesity, visceral obesity, low HDL cholesterol, high total cholesterol, elevated triglycerides and inflammation and the association with nutrition and socioeconomic indicators were measured in women 15-49 years of age using data from a nationally representative cross-sectional stratified survey.

RESULTS

Diabetes and prediabetes were found in 3.4% and 8.3% of women, respectively. Hypertension was found in 6.6% of women, and 43.1% had inflammation, 21.9% had elevated triglycerides, 47.5% had low HDL cholesterol, and 4.7% had elevated total cholesterol. Obesity (body-mass-index >30) and visceral obesity affected 25.0% and 50.8% of women, respectively. All cardiometabolic risk factors were found to be highly and positively associated, and 72.2% of women aged 15-49 and 88.4% aged 40-49 had at least one cardiometabolic disorder. Metabolic syndrome affected 24.8% and 44.4%, respectively. Aside from higher age, low education was associated with a higher prevalence of most cardiometabolic risk factors. Only a few associations were detected between cardiometabolic risk factors and nutrition-related indicators.

CONCLUSIONS

The high prevalence of cardiometabolic risk factors and their co-existence in Lebanese women is concerning. Our data indicates that controlling obesity and inflammation is key to reducing the prevalence and minimizing the risk of cardiovascular diseases.

CONFLICTS OF INTERESTS

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EPO6_100

NEEDS SURVEY FOR PARTICIPANTS OF COOKING CLASS FOR CANCER PREVENTION

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BACKGROUND AND OBJECTIVES

Cancer has been the leading cause of death among Japanese since 1981. National Cancer Center Hospital East has been hosting “Cooking Class for Cancer Prevention” three times a year since July 2009 for healthy individuals, providing information on desirable diets and dietary habits incorporating cooking practice. However, the effectiveness of these classes in cancer prevention depends on whether participants are able to apply what they have learned in the class to their daily lives. Therefore, it is necessary to equip them with self-management skills for cancer prevention, while providing practical information based on their culinary skills and lifestyle habits.

METHODS

In order to enhance the quality of the “Cooking Class for Cancer Prevention,” we performed a qualitative analysis through focus group interviews together with a quantitative analysis through tabulation of questionnaires to investigate the needs of participants.

RESULTS

articipants of the “Cooking Class for Cancer Prevention” were recruited by the National Cancer Center Hospital East. Each class included a lecture and cooking demonstrations by a registered dietitian, as well as hands-on cooking practice. Afterwards, self-administered questionnaires were collected. Group interviews were conducted with participants who responded to the questionnaire and gave their consent.Of the 66 participants (with a mean age of 62.9 years), 97% were women. The most common lifestyle change participants wanted to incorporate into their lives were related to diet, with the largest number of participants (79%) wanting to reduce salt intake. In contrast, only 29% were willing to undergo medical screenings. Group interviews were conducted with 13 participants who completed the questionnaire and gave their consent. Among the knowledge gained in the cooking class, the participants listed dietary habits and the use of ingredients and seasonings which are effective in preventing cancer, as what they want to practice in their real lives. Difficulties in implementation included accommodating family members of different ages and genders, reducing salt intake and changing habits, and indicated their needs for a way to develop meals.

CONCLUSIONS

Most participants were at the contemplation and preparation stages of the Transtheoretical Model, developing a program that incorporates behavior therapy to enhance self-efficacy, while providing information according to their needs, was considered effective in helping them acquire self-management skills.

CONFLICTS OF INTERESTS

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EPO6_101

PROTECTIVE EFFECTS OF CHRYSIN ALONE AND IN COMBINATION WITH SULFASALAZINE ON DINITROBENZENE SULFONIC ACID-INDUCED COLITIS IN MICE

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BACKGROUND AND OBJECTIVES
Ulcerative colitis is characterized by frequent relapsing inflammation in the colon. Chrysin, a nature flavonoid compound, is known for its anti-inflammatory properties. This study aimed to evaluate the effects of chrysin alone and in combination with sulfasalazine (SU) on colonic damage and inflammation in mice.

METHODS
Male C57BL/6JNarl mice were divided into five groups: control (CON), dinitrobenzene sulfonic acid (DNBS), DNBS + chrysin (DCH), DNBS + SU (DSU), and DNBS + chrysin + SU (DCS). Chrysin and SU were administered via oral gavage for 46 days. All animals were subjected to two episodes of DNBS instillations on day 22 and day 44, while the mice in CON group were given 50% ethanol instead.

RESULTS
The RESULTS revealed a significant colonic damage and inflammation in DNBS group, as evidenced by colon shortening with higher histological score, and decreased the expressions of E-cadherin (E-cad) and zonula occludens-1 (ZO-1). DSU and DCS groups exhibited significant improvement in DNBS-induced colon shortening, with DSU enhancing E-cad expression and decreased colonic tumor necrosis factor α (TNFα) and interlukin-1β levels. Additionally, DCH and DCS groups significantly increased the expressions of E-cad and ZO-1, with reducing the percent involvement of histopathology injury severity and TNFα level. Chrysin supplementation also increased short-chain fatty acid levels in the cecal contents.

CONCLUSIONS
These findings indicated that chrysin combination with SU may provide a beneficial strategy for protecting against the progression of DNBS-induced inflammation and mucosal damage in ulcerative colitis.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_102

EFFECTS OF THE ADDITION OF SPRATS TO THE DIET OF RATS ON BODY WEIGHT GAIN, WEIGHTS OF SELECTED ORGANS AND LIVER ENZYME ACTIVITY

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BACKGROUND AND OBJECTIVES
A balanced diet is the key to good health and well-being. Eating fish, especially oily fish such as salmon, mackerel or sprat, is good for your health because it is a source of valuable omega-3 fatty acids. These fats help lower total cholesterol, support heart function and improve brain function and help to reduce inflammatory parameters. Fish is also rich in protein, vitamins A and D, and minerals such as iodine and selenium, which support immunity and skin health. Regular consumption of fish can help reduce the risk of many chronic diseases. The objective of the present study was to verify the hypothesis about the impact of sprats added to the experimental diets of Wistar rats with induced oxidative stress on body weight gain, weights of selected organs and liver enzyme levels.

METHODS
Male, Wistar strain rats (5-week-old) with average body mass between 87-140 g were used. Animals were acclimated for 10 days on standard lab chow before assigned to experimental groups. Injection of streptozotocin in animals was in 8th day of acclimatization period. During the experiment period all animals were housed in plastic cages under controlled temperature (25°C) and light (12:12 light: dark cycle) conditions. Animals were divided into four groups. Group I – rats were fed AIN-93G diet, group II - rats were fed AIN-93G diet and oxidative stress was induced by intraperitoneal injection of streptozotocin (65 mg/kg/b.m), group III – rats were fed AIN-93G diet modified with addition of sprats, group IV - rats were fed AIN-93G diet modified with addition of sprats and oxidative stress was induced by intraperitoneal injection of streptozotocin (65 mg/kg/b.m). After 10 weeks, of experimental period fasted rats the rats will be euthanized. Blood samples were rapidly collected, transferred to centrifuge tubes and the serum was separated by low-speed centrifugation. The level of ALT and AST were determined in the serum. Livers, kidneys, heart were removed, washed in a cold solution of 0.9 % sodium chloride dried and weighed.

RESULTS
No significant changes in rodents body weight, weight of livers, hearts and kidneys were observed. Between the groups fed the AIN-93G diet and the AIN-93G diet with added fish, changes in liver enzyme levels were observed.

CONCLUSIONS
Further research is needed to deepen our understanding of this issue and to fill gaps in existing research.
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EPO6_103

THE EFFECT OF SPRATS ON LIPID METABOLISM IN EXPERIMENTAL RATS

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BACKGROUND AND OBJECTIVES
Sprats (*Sprattus sprattus*) belong to the *Clupeidae* family and are a rich source of essential nutrients and minerals such as calcium, magnesium, iodine, selenium and zinc. It is also well known that thermal treatment can affect the nutritional composition and its functional effects. The objective of this study was to evaluate the effect of baked sprats added to the experimental diet on lipid metabolism in experimental rats with induced oxidative stress.

METHODS
Animals were acclimated to standard laboratory chow for 10 days before being assigned to experimental groups. Animals were injected with streptozotocin on day 8 of the acclimatisation period. The rats were divided into four groups. Group I - rats were fed with AIN-93G diet (negative control group), Group II - rats were fed with AIN-93G diet and oxidative stress was induced by intraperitoneal injection of streptozotocin (65 mg/kg/b.m.). Group III - rats were fed AIN-93G diet modified with addition of sprats, Group IV - rats were fed AIN-93G diet modified with addition of sprats and oxidative stress was induced by intraperitoneal injection of streptozotocin (65 mg/kg/b.m.). After 10 weeks of the experimental period, the rats were fasted, euthanised and blood samples were taken to obtain serum. Livers were dissected, weighed and frozen. In the serum, total cholesterol, HDL cholesterol, LDL cholesterol and triglicerides were measured using commercially available assays. Crude lipid content was measured in the liver using the Soxleth method.

RESULTS
Total and LDL cholesterol levels were significantly lower in sprat-fed rats in groups III and IV compared to experimental rats in groups I and II. Conversely, serum HDL cholesterol levels were significantly increased in rats from groups III and IV compared to groups I and II. The concentration of triglycerides significantly increased in the serum of rats of groups III and IV as compared to groups I and II. A similar trend was observed in the concentration of crude lipids in the liver.

CONCLUSIONS
Based on the RESULTS obtained, it can be suggested that sprats added to the diets of animals with/or without oxidative stress can modulate lipid metabolism, although further studies are required.
Acknowledgement. The research was funded by the National Science Centre, Poland, UMO-2020/39/I/NZ9/02959

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_104

A COMPREHENSIVE ANALYSIS OF DIETARY INTAKE OF INDIVIDUAL CAROTENOIDS AND ODDS OF OVERWEIGHT/OBESITY – FINDINGS FROM THE PERSIAN COHORT STUDY

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BACKGROUND AND OBJECTIVES
Major factors affecting human health and contributing significantly to the worldwide burden of disease are overweight and obesity, constituting growing public health concerns (1, 2). Dietary carotenoids have been shown in some, though partly conflicting, studies to have independent positive impacts on a range of health-related outcomes (3, 4). The present study aimed to thoroughly examine the association between individual dietary carotenoids and the odds of overweight or obesity. We postulated that a decreased risk of overweight or obesity is related to a higher dietary intake of carotenoids.

METHODS
Dietary intakes of 4202 participants (general adult population, men/women) of the PERSIAN cohort study were investigated by a 237-item validated FFQ, and carotenoid intake was determined by means of USDA food databases (3, 4). Several models of logistic regression were applied to assess the association between obesity/overweight (BMI≥25 kg/m2) and dietary intake of individual carotenoids after adjusting for confounders.

RESULTS
Calorie-adjusted total carotenoid intake (OR=0.392, CI95%: 0.274-0.560, P<0.01) and specific individual carotenoids, including β-carotene, lutein/zeaxanthin, phytoene, phytofluene, and violaxanthin were associated with obesity after adjusting for age and sex (all P<0.01), while lycopene was not. The associations remained statistically significant even after adjusting for marital status, education, job, and physical activity.

CONCLUSIONS
In summary, intake of several individual carotenoids showed promising associations with reduced overweight and obesity, with a notable exception of lycopene. Further research in additional populations is needed to confirm these findings and explore potential mechanisms of action.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_105

SODIUM INTAKE AS A RISK FACTOR FOR OSTEOPOROSIS: A SYSTEMATIC REVIEW AND NARRATIVE SYNTHESIS OF OBSERVATIONAL STUDIES OF ADULTS

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BACKGROUND AND OBJECTIVES
Understanding the possible role of sodium intake on the aetiology of osteoporosis can be relevant when developing and implementing prevention strategies for osteoporosis and its associated fractures. The objective is to examine the association between sodium intake/excretion and bone health by summarizing evidence of observational studies.

METHODS
: A literature search was performed in 5 electronic databases from inception to August 2023. The inclusion criteria were non-institutionalised adults with measured sodium intake or excretion. Outcomes were any bone indices. A narrative synthesis was undertaken. The certainty of the evidence was evaluated using GRADE and risk of bias was assessed using the quality criteria checklist for primary research of the Academy of Nutrition and Dietetics. PROSPERO registration: CRD42017065360.

RESULTS
34 unique studies met our inclusion criteria (n>160,000): 30 cross-sectional studies and 4 cohort studies. The study populations consisted of either only women or men and women combined, aged 18 to 89 years. 9 cross-sectional studies and 1 cohort study showed no association, and the remaining studies indicated that both low or high sodium intake/excretion was associated with decreased bone mineral density, higher risk of fractures or higher risk of osteoporosis. The certainty in the evidence is very low due to serious risk of bias, risk of inconsistency and risk of publication bias.

CONCLUSIONS
This narrative synthesis confirms how challenging it is to study the association between sodium and bone health. Most of the studies available are cross-sectional, which gives uncertain direction of causality, even though they included large study populations. The methodological limitations in the primary studies - such as lack of adjustment for relevant confounders, misclassification of exposure, missing data, selective reporting bias, and heterogeneous and inconsistent outcome reporting across studies - prohibits meta-analysis. Randomised controlled trials or prospective cohort studies using standardised set of outcomes are needed to establish dietary guidelines.

CONFLICTS OF INTERESTS
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EPO6_106

SOY INTAKE, SERUM URIC ACID LEVELS, AND HYPERURICEMIA IN CHINA: A PROSPECTIVE COHORT STUDY

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BACKGROUND AND OBJECTIVES
The connection between soy intake and serum uric acid remains controversial. Association with hyperuricemia (HUA) is inconsistent, and data is limited. We assessed the longitudinal association between soy intake and serum uric acids level and risk of hyperuricemia among Chinese adults.

METHODS
We analyzed data of 7124 participants aged 18 years and above with at least two wave of completed data and without HUA at baseline from the China Health and Nutrition Survey (CHNS) with 10 years of follow-up. Hyperuricemia was defined as a fasting serum uric acid level > 420μmol/L. Intakes of soy were assessed via three consecutive days of 24-hour dietary recall method. On the basis of soy intake, participants were divided into 4 groups: non-consumers, T1 (lowest), T2 (medium), T3 (highest). Generalized estimated equation (GEE) models were used to analyze the association of soy intake with serum uric acid levels and hyperuricemia.

RESULTS
Overall, 9% (n=614) cases of hyperuricemia were documented during 16,859 person-years of follow-up. The soy intake was 19·4g/d, 12·1g/d, and 10·5g/d in 2009, 2015, and 2018, respectively. In the multivariate analysis, participants with highest (T3) soy intake was associated with a decrease in serum uric acid (regression coefficient [β]-3·53[-6·23--0·83]), compared to non-consumers. Participants in the highest (T3) soy intake groups showed a decrease in the risk of hyperuricemia (relative risk [RR] 0·76 [0·61-0·94]) compared to the non-consumers group.

CONCLUSIONS
Soy intake is negatively associated with serum uric acid levels and serves as a protective factor against hyperuricemia. Increasing soy intake is an important dietary strategy for hyperuricemia prevention.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_107

MONUCO: MONITORING NUTRITIONAL CONSEQUENCES OF OBESITY TREATMENT ON WOMEN'S HEALTH AND TRANSGENERATIONAL EFFECTS FOR HEALTHIER FUTURE GENERATIONS – A MULTI-CENTRE PROSPECTIVE COHORT STUDY

Rebecca Schipper,[1]; Laura Heusschen,; Lara Schepers,[1]; Femke Fleur Verstraete,[1]; Eric Hazebroek,[2]; Ellen Kampman[1]; Agnes Berendsen[1]
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BACKGROUND AND OBJECTIVES
In the Netherlands, over 12.000 patients receive obesity treatment annually (e.g., metabolic surgery or pharmacological treatment), of which the majority (80%) is female. Although obesity treatment is effective in reducing long-term bodyweight, it also negatively impacts nutritional status (vitamins, minerals, but also proteins), which may result in e.g. loss of muscle mass and bone mineral density, particularly in menopausal women. Furthermore, impaired nutritional status during subsequent pregnancy may potentially be detrimental for foetal growth and child development of the estimated 50% of women who become pregnant after obesity treatment. The transgenerational effects of obesity and obesity treatment induced maternal nutrient deficiencies on foetal growth, child development and the cardiometabolic disease and obesity risk of their offspring remain unclear.

METHODS
To monitor women's health, we will employ an organ systems approach by incorporating measurements of all eleven organ systems. Smart monitoring will be used to less-invasively monitor health from their home setting allowing allocating timely and targeted interventions towards the needs and living situation of the participants. To study the transgenerational consequences of obesity treatment on foetal growth and child health, pregnant women with a history of obesity treatment and their children will be monitored as well. Information on dietary intake will be collected using a mobile app and detailed information on nutrient status and nutrient stores will be analysed.

RESULTS
A multi-centre prospective observational study has been established with the aim to recruit 1150 women aged 18-55 years of age, living with obesity and receiving obesity treatment in the form of metabolic surgery or pharmacological treatment within multiple obesity centres. Additionally, pregnant women with a history of obesity treatment will also be recruited via obstetricians/gynaecologists and midwifery practices.

CONCLUSIONS
Previous studies have not looked into the longer-term health consequences of obesity treatment, specifically in women, mostly because it is burdensome and expensive to broadly monitor health in a health care setting and also because pharmacological treatment is relatively new. However, it is urgent to gather evidence and insights on the nutritional, metabolic and physiological consequences of obesity treatment in order to provide timely and targeted interventions to maintain and improve health of women with a history of obesity treatment and to contribute to healthier future generations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_108

FECAL MICROBIOTA TRANSPLANTATION (FMT) OF HUMAN FECES ASSOCIATED WITH DIFFERENT DIETARY INTEGRATION MODULATES THE COLORECTAL CANCER (CRC) RISK IN GERM-FREE RATS

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BACKGROUND AND OBJECTIVES

Dietary habits significantly impact colorectal cancer (CRC) risk, influencing both the gut microbiota and its metabolic signature. Despite extensive research, the complex interactions between diet, gut microbiota, and metabolites in CRC risk remain unclear. In this direction, we recently demonstrated the direct link between diet-modulated gut bacterial communities and increased CRC risk in animal models (De Filippo et al., 2024). Here, we present new, unpublished data on Fecal Microbiota Transplantation (FMT) from human cohorts treated with three different dietary interventions to germ-free rats, in which the CRC risk was chemically induced. Our goal is to evaluate whether FMT can modulate CRC risk when transferred to a germ-free rat model and identify the key bacterial communities involved.

METHODS

We assessed the impact of three diets associated with CRC risk: a meat-based diet (MBD), a meat-based diet with alpha-tocopherol supplementation (MBDT), and a pesco-vegetarian diet (PVD). A controlled, randomized, parallel-group, 12-week intervention was conducted with 113 participants aged 18-50 years. We evaluated differences in fecal water genotoxicity, bile acids, fecal microbiota, and metabolomic profiles. To link bacterial communities to CRC risk, we performed Fecal Microbiota Transplantation (FMT) in male germ-free (GF) rats (n=10/group), randomly assigned to the three dietary groups. Fecal samples were collected three weeks after FMT, followed by CRC induction using 20 mg/kg of Azoxymethane. All rats were fed a standard pellet diet, with fecal samples collected two weeks after AOM injection and at sacrifice (14 weeks after AOM).

RESULTS

Dietary supplementation-MBD in human cohorts significantly increased CRC risk, however, it produced mild effects on overall bacterial communities, although distinctive changes in metabolic profiles were evident. The FMT caused risk transmission from humans to GF-rats, and this was accompanied by a more evident overall microbiota shift and related metabolic variations. Furthermore, persistent bacterial variants emerged, i.e., able to reside with the host even at the end of the experimental timeline.

CONCLUSIONS

The different dietary treatment produced specific taxonomic and metabolic changes and affects the CRC risk in the human cohort. Moreover, the increased risk observed in the human cohort fed with MBD was connected to specific changes in metabolic profiles and can be transferred through FMT into GF rats.

CONFLICTS OF INTERESTS

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EPO6_109

UNRAVELING THE ROLE OF FOODS ON INFLAMMATORY MEDIATORS: A SYSTEMATIC REVIEW OF HUMAN DIETARY INTERVENTION TRIALS

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BACKGROUND AND OBJECTIVES

Unhealthy lifestyle-related factors have driven the onset and progression of chronic metabolic diseases (1), characterized by chronic low grade systemic inflammation (2). In particular, diet can modulate the inflammatory status, enhancing or mitigating its severity on the basis of its composition (3,4). To unravel the associations between specific food and inflammation, it is crucial to assess the impact on cytokine production, key mediators of inflammation, through data from well-designed and long-term trials. Therefore, this systematic review aimed to explore the available evidence from chronic dietary interventions focusing on the effects of foods/food categories on circulating cytokines, in humans.

METHODS

A PubMed database research, by specific keywords, was carried out on September 2024. Inclusion criteria foresaw chronic studies, measuring cytokine levels in human participants of intervention studies evaluating the effects of food consumption. Articles not in English, not focused on foods (i.e. supplements) or involving enteral or parenteral nutrition were excluded. After screening, studies were divided based on the food or beverage provided.

RESULTS

The search strategy pointed out 2,262 items, of which 70 studies met the inclusion criteria. Among these, fruits and vegetables reduced cytokines levels in 6 studies on 7, as cereals (7/9) and dairy products (4/5). Among beverages, fruit juices displayed anti-inflammatory effect in 13 studies on 19. Studies focusing on vegetable and animal fats and fish were effective in 4 studies on 7 and 4 on 6, respectively. However, seeds (2/5), brewed beverages (2/5), and nuts (0/2) displayed limited or inconsistent findings. As regards single cytokines, a total of 25 markers were investigated, with IL-6 and TNF-α being the most frequently analyzed (60 and 47 studies, respectively). On the whole, studies exhibited significant heterogeneity in study design, type of cytokines analyzed, participant characteristics and health status, as well as intervention durations, making it difficult to make firm CONCLUSIONS.

CONCLUSIONS

The present systematic revision of literature suggested a potential of certain foods and food groups, to modulate inflammation through their effects on cytokines. However, the limited number of studies and the significant variability in study designs and populations, suggest the need for more comprehensive and methodological research to confirm the relationship between foods and modulation of inflammation. Funding: EU-Next Generation EU. Project Code: ECS00000041; Project CUP: C43C22000380007; Title: Innovation, digitalization and sustainability for the diffused economy in Central Italy–VITALITY.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_110

ASSOCIATION BETWEEN THE INTAKE OF FOOD CONTAINING HAEM IRON AND COLORECTAL CANCER RISK IN A POPULATION OF THE BASQUE COUNTRY

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BACKGROUND AND OBJECTIVES

The consumption of certain foods of animal origin, specially red meat and processed meat, is associated with a risk of colorectal cancer (CRC), a major cause of death in affluent countries. Epidemiological and experimental evidence supports the hypothesis that haem iron present in these foods promotes CRC.
Therefore, we studied possible associations between the intake of food containing haem iron (red and processed meat vs white meat −poultry and fish−) and CRC risk.

METHODS

This observational case-control study includes 229 patients diagnosed with CRC and 229 age- and sex-matched controls from a population-based bowel cancer screening program. Dietary intake was assessed using a validated food frequency questionnaire (Telleria-Aramburu et al., 2021). Ethical approval was obtained from the Clinical Research Ethics Committee of the Basque Country. Logistic conditional regression was used to calculate odds ratios (ORs) and 95% confidence intervals (CI) for CRC risk. The models were adjusted for known risk factors: sex, age, smoking status, antiplatelet and/or anticoagulant use, body mass index, intake of dietary fibre, calcium, folate, vitamin D, and ethanol, physical activity level, deprivation index (Orueta et al., 2013), and Predictive Risk Modelling (School of Public Health, Johns Hopkins University, 2012; Verisk Analytics, 2012). The significance level was corrected using a Bonferroni correction, assuming alpha was equal to 0.01.

RESULTS

Moderate intake of processed meat was associated with CRC risk (tertile 2 vs 1, OR=3.20, 95% CI 1.37−7.49, $p<0.01$). Although this association was not observed with a high intake ($p>0.05$), a high intake (3th tertile) of both, red and processed meat, was associated with increased CRC risk, even though with a lower significance (tertile 3 vs 1, OR 2.09, 95% CI 1.04−4.21, $p<0.05$). The RESULTS on processed meats were confirmed in the separate analysis for men, and distal colorectal cancer. However, consumption of white meat (poultry and fish) was not associated with CRC risk ($p>0.05$).

CONCLUSIONS

Moderate intake of processed meat was associated with significant increased risk of CRC. Our RESULTS highlight the difficulty of isolating the independent effects of food group intake, given the probable confounding influence of other dietary and lifestyle factors.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_112

A RANDOMIZED CLINICAL TRIAL ON GUT MODULATION: PROBIOTICS AND PREBIOTICS FOR IMPROVED WEIGHT AND QUALITY OF LIFE IN WOMEN WITH FIBROMYALGIA

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BACKGROUND AND OBJECTIVES
Increased body weight causes further worsening of clinical symptoms in fibromyalgia syndrome, which is associated with pain and poor quality of life. The aim of this study was to investigate the effect of supplementation with probiotics and prebiotics on anthropometric measurements, energy and nutrient intake, and quality of life in overweight and obese patients with fibromyalgia syndrome (FMS).

METHODS
We extracted data from a clinical trial with 39 obese or overweight patients with FMS. The participants were randomly assigned to receive probiotics, prebiotics, or placebos for 8 weeks. Energy and some nutrient intake, anthropometric measurements, and SF-36 quality of life consisting of 8 sub-dimensions were measured during the pre-, mid-, and post-intervention phases. A repeated measure ANOVA was used to analyse the variables.

RESULTS
It was observed that the general characteristics of the groups were similar to each other. No significant difference in either BMI or other anthropometric data was seen among the groups. Although prebiotics showed an increasing trend in energy intake, no statistically significant RESULTS were found among the groups. No statistically significant difference was found in group-time interaction in the nutrient intake of the groups. Pain, a sub-dimension of SF-36 quality of life, improved with probiotics compared to placebo (p valuetime×groups<0.05). However, other subcomponents of SF-36 indicated no significant intervention-time interactions.

CONCLUSIONS
Overall, probiotic supplementation for 8 weeks among FMS patients resulted in improvement of pain, whereas pro- and pre-biotic administration had no significant effect on food intake and anthropometric data.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_115

EIGHT-WEEKS OF BETAINE SUPPLEMENTATION IN PREMENOPAUSAL WOMEN WITH INCREASED BODY WEIGHT: A RANDOMIZED, DOUBLE-BLIND PLACEBO-CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
Betaine, a methyl derivative of the amino acid glycine, can be found naturally in food, but is also used in dietary supplements. Because betaine has been suggested to be effective in improving body composition, the aim of the present study was to determine the effects of eight-weeks of supplementation of 3 g/day betaine on body composition and lipid metabolism markers in women with increased body weight.

METHODS
The study was a randomized, double-blind, parallel-group, placebo-controlled trial (NCT06344377). Premenopausal women aged 18–45 years with body mass index (BMI) ≥ 25 kg/m2 and with waist circumference ≥ 80 cm were enrolled in 2024. Height was measured with a stadiometer, while a Bod Pod (Cosmed, Italy) was used to determine body mass and composition. Waist and hip circumferences were measured using nonelastic tape. Blood glucose concentrations and lipid profile were measured using an automatic biochemical analyzer (Konelab 20i) in an enzymatic assay.

RESULTS
Twenty-four women finished the study. After supplementation, no group differences were noted in body mass, body composition, or waist or hip circumference. There were also no differences in total cholesterol, LDL cholesterol, glucose, or triglyceride concentrations. The only difference was found in HDL cholesterol concentrations, which had significantly improved in the betaine-supplemented group ($p < 0.05$).

CONCLUSIONS
Short-term supplementation with betaine seems not to have had a significant effect on body mass or composition, but may improve blood lipid profiles in women with increased body weight.
This work was supported by the National Science Centre, Poland (grant 2020/37/B/NZ9/00256).

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_118

Impact of Spirulina-enriched yogurt-like dessert on blood pressure in overweight individuals with high cardiometabolic risk: RESULTS from in vitro studies and a randomized, placebo-controlled clinical trial

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BACKGROUND AND OBJECTIVES
To evaluate the effects of spirulina biomass and its incorporation into yogurt on angiotensin-converting enzyme (ACE) inhibitory activity and hypertension management.

METHODS
Two studies were conducted in parallel: an in vitro assessment of ACE inhibitory properties and a clinical trial targeting high cardiometabolic risk individuals. The in vitro study analyzed the ACE inhibitory activity of a peptide fraction (0-3 kDa) derived from spirulina platensis biomass (SB) and a yogurt dessert fortified with spirulina biomass (YSB). The clinical trial involved a randomized, placebo-controlled format with 64 overweight/obese participants consuming two portions of spirulina-enriched yogurt (4g/day) or placebo for 8-weeks and 4-weeks follow-up, while maintaining a Westernized-type diet, assessing peripheral and central systolic and diastolic blood pressure (BP) along with the augmentation index.

RESULTS
In vitro RESULTS showed that SB fractions significantly increased ACE inhibitory activity ($p<0.05$), contrasting with the YSB fractions that did not exhibit a similar effect, suggesting that spirulina's bioactive components might be less effective when processed into yogurt. Clinically, both groups maintained stable blood pressure throughout the study, with no significant interaction effects observed between the intervention and time.

CONCLUSIONS
The addition of SB to yogurt appeared to diminish its ACE inhibitory capacity *in vitro*, and spirulina supplementation in this form did not significantly improve hypertension markers *in vivo*. These findings underscore the complexity of food matrix effects on functional food efficacy and the need for further research into the integration of spirulina into everyday foods for high cardiometabolic risk individuals. (ClinicalTrials.gov identifier: NCT06114563).

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_119

ASSOCIATION OF DIETARY SODIUM AND POTASSIUM INTAKE, SODIUM TO POTASSIUM RATIO AND HYPERTENSION AMONG ADULTS IN [XXX] AND [XXX]: THE PICCAH STUDY

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BACKGROUND AND OBJECTIVES
The Western Pacific region has the highest non-communicable disease mortality. Increasing reliance on imported, high sodium processed foods throughout the Pacific Islands may exacerbate this problem. Excess sodium and inadequate potassium intake are linked to hypertension and risk for cardiovascular disease yet has not been evaluated in Micronesia. This study aims to examine the association of sodium and potassium intake and sodium-to-potassium (Na:K) ratio with hypertension (HTN) among adults in [XXX] and [XXX], located in Micronesia.

METHODS
The Pacific Islands Cohort on Cardiometabolic Health (PICCAH) Study, including 489 adults in [XXX] and [XXX] with both blood pressure and diet measures and demographics. Sodium and potassium intakes were estimated from the Marianas Food Frequency Questionnaire, in [XXX], and from the 24-Hour Recall then processed through the Pacific Tracker version 3.0 in [XXX]. Blood pressure was categorized as non-HTN (normal or elevated), Stage 1 HTN, and Stage 2 HTN using the American College of Cardiology and the American Heart Association guidelines. Multivariable logistic regression was used to examine associations between sodium and potassium intake and Na:K ratio with HTN. Odds ratios were adjusted for sex, age, ethnicity, BMI and location.

RESULTS
Majority of adults were CHamoru (45.3%) or Micronesian (36.7%) and had high BMI as 58.8% were obese. Differences by study location were significant for ethnicity, blood pressure category, potassium and sodium intake, and Na:K ratio. Specifically, higher rates of stage 2 HTN in [XXX], higher sodium intake in [XXX], and lower potassium intake in [XXX]. Only potassium intake was associated with stage 1 HTN. The adjusted odds ratios were 0.41 (95% CI, 0.21-0.78), and 0.69 (95% CI, 0.39, 1.22) comparing 2.0-2.9 and ≥3 g/d respectively, with ≤1.9 g/d potassium intake.

CONCLUSIONS
High sodium intake is associated with Stage 1 HTN among adults in [XXX] and [XXX]. Tropical produce in the Micronesia are great sources of potassium and readily available in [XXX] and [XXX], and intake of these food sources may be beneficial for HTN and obesity prevention; in addition to shifting the food system.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_120

PLANT-BASED DIETARY PATTERNS MITIGATE THE ASSOCIATION BETWEEN INDOOR AIR POLLUTION AND DEPRESSION AMONG OLDER ADULTS IN CHINA

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BACKGROUND AND OBJECTIVES
Indoor air pollution has been identified as a contributing factor to the onset of depression, while adherence to plant-based diets is associated with reduced depressive symptoms. We aimed to explore the potential interaction of plant-based diets with depressive symptoms among older people.

METHODS
We utilized cross-sectional data from the 2018 Chinese Longitudinal Healthy Longevity Survey (CLHLS), encompassing 11,371 participants aged 65 years and older. Plant-based diet indices (PDI, hPDI, uPDI) were calculated using dietary data from a simplified food frequency questionnaire (FFQ). Indoor air pollution exposure was assessed via cooking fuels, humidity, and mold presence. Depression was measured using the CES-D-10. Associations were evaluated using multivariable logistic regression, stratified by indoor air pollution, key covariates, and food groups.

RESULTS
Participants exposed to severe indoor air pollution had 64% higher odds of depression (OR = 1.64, 95% CI: 1.41–1.92) compared to those with mild exposure. Higher adherence to the PDI and hPDI was associated with lower odds of depression (ORPDI = 0.81, 95% CI: 0.74–0.88; ORhPDI = 0.73, 95% CI: 0.68–0.79), especially in mild pollution environments. Conversely, the uPDI was linked to increased odds (ORuPDI = 1.86, 95% CI: 1.64–2.10). A significant interaction between PDI, hPDI and indoor air pollution was observed (*P*-interaction = 0.005, 0.004), highlighting the protective role of healthy plant-based diets.

CONCLUSIONS
Plant-based dietary patterns may attenuate the impacts of indoor air pollution on depression among older Chinese adults. Adherence to plant-based dietary patterns may be useful to prevent depression caused by indoor air pollution.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

Changes in intake of plant-based diets and weight change: RESULTS from 3 prospective cohort studies.
Plant-Based Dietary Patterns and Incidence of Type 2 Diabetes in US Men and Women: RESULTS from Three Prospective Cohort Studies.
1. Dietary patterns and associations between air pollution and gestational diabetes mellitus.
2. Long-Term Air Pollution, Genetic Susceptibility, and the Risk of Depression and Anxiety: A Prospective Study in the UK Biobank Cohort.
3. American Women Aged 40 to 75 Years With Uncontrolled Hypertension: A Secondary Analysis of a Randomized Clinical Trial.
4. Plant-based dietary patterns in relation to mortality among older adults in China.
5. Facilitators and barriers to the implementation of improved solid fuel cookstoves and clean fuels in low-income and middle-income countries: an umbrella review.
6. Air pollution exposure and depression: A comprehensive updated systematic review and meta-analysis.
7. Quality of Plant-Based Diet and Risk of Total, Ischemic, and Hemorrhagic Stroke
8. Changes in Plant-Based Diet Quality and Total and Cause-Specific Mortality

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EPO6_121

EFFECTS OF LALMIN IMMUNE PRO SUPPLEMENTATION ON ADIPOSE TISSUE INFLAMMATORY MARKERS AND PROTEOMIC PATHWAYS IN OLDER ADULTS WITH NON-LEAN BMI

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BACKGROUND AND OBJECTIVES
Chronic low-grade adipose inflammation in older adults with higher body mass index can contribute to metabolic and immune dysfunction. This open-label pilot study aimed to evaluate the impact of 28-day supplementation with Lalmin Immune Pro (containing β-1,3/1,6 glucan, zinc, selenium, and vitamin D2) on inflammatory markers and proteomic pathways in subcutaneous adipose tissue and serum.

METHODS
Fifteen participants (36.5 ± 6.1 kg/m²; 66.40 ± 4.6 yr) consumed six Lalmin Immune Pro gummies daily for 28 days. Each daily serving contained 250 mg of yeast-derived β-1,3/1,6 glucan, 13.7 mg of zinc, 65.0 mcg of selenium, and 500 IU of vitamin D2. Blood and subcutaneous adipose tissue samples were collected pre-supplementation (Day 0), and post-supplementation (Day 28). Adipokine concentrations in adipose tissue supernatants, and serum inflammatory markers were measured via multiplex immunoassays. Tandem-mass-tagged proteomic analysis was performed on adipose tissue samples (Reactome differential pathway analysis via CAMERA algorithm).

RESULTS
Significant reductions in adipose tissue secretion of leptin ($p = 0.001$), MCP-1 ($p = 0.003$), MIP-3α ($p = 0.009$), IL-8 ($p = 0.004$), and IL-6 ($p = 0.020$) were observed post-supplementation. Serum inflammatory markers showed no significant changes ($p > 0.05$). Proteomic analysis of adipose tissue identified 5387 proteins, with significant alterations in 107 pathways. This included a Lalmin Immune Pro-induced downregulation of adaptive (FDR = 0.025, LogFC = -0.02) and innate immune system pathways (FDR = 9.28E-07 LogFC = -0.06). Lalmin Immune Pro supplementation also resulted in the upregulation of several pathways associated with mitochondrial function, including cristae formation (FDR = 6.25E-05, LogFC = 0.304), mitochondrial protein import (FDR = 1.00E-05, LogFC = 0.273), and aerobic respiration (FDR = 1.40E-05, LogFC = 0.210)

CONCLUSIONS
Lalmin Immune Pro supplementation significantly reduced inflammation-related adipokine secretion from subcutaneous adipose tissue. Analysis revealed modulation of immune and metabolic pathways, suggesting potential benefits for inflammation and metabolic health in older adults with elevated BMI.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_124

ASSOCIATION BETWEEN DIETARY PATTERNS AND QUALITY OF LIFE IN ADULTS LIVING WITH TYPE-2 DIABETES MELLITUS

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BACKGROUND AND OBJECTIVES
A key aspect of diabetes mellitus management is dietary modifications (Papamichou et. al, 2019) and good management of the condition can positively impact quality of life (Enang et al., 2021). The main study objectives were to determine the dietary patterns and quality of life scores in individuals living with type-2 diabetes, and an association between the two variables, if any.

METHODS
A cross-sectional study design was employed. Two-hundred outpatients with type-2 diabetes were recruited. A pretested questionnaire was used to collect socio-demographic, clinical, dietary patterns (using a Food Frequency Questionnaire), and quality of life (using the World Health Organization Quality of Life (WHOQOL) - BREF) data of participants. Data was analyzed using SPSS Version 22. Quality of life data was analyzed according to WHOQOL-BREF protocol. Principal Component Analysis (PCA) was used for dietary pattern analysis. Kruskal-Wallis' and correlation tests were used to analyze the relationship between variables ($p \leq 0.05$).

RESULTS
Quality of life was moderate overall, as well as in the social, physical and environmental domains, but participants had high psychological quality of life. Age, participants' socioeconomic status and duration of diabetes were the sociodemographic and clinical factors found to be inversely related with overall quality of life. Three dietary patterns were identified, and in descending order of consumption, these were the High energy, Vegetables and Fruits, and Animal Products patterns. Components of the high energy pattern included many high carbohydrate, local foods, as well as sweets, artificial spices and processed and cured meats/fish. Green leafy and other vegetables as well as fruits were the main components of the vegetable and fruits pattern. Main components of the animal products pattern included poultry, red meat, fish and alcohol. Only the vegetables and fruits pattern was positively associated with the psychological, environmental and overall quality of life.

CONCLUSIONS
The vegetables and fruit pattern was positively associated with the psychological and environmental quality of life domains and overall quality of life. Thus, in line with other studies, RESULTS from this study reinforces the recommendation that dietary strategies for diabetic patients should align with general healthy eating guides, predominantly the consumption of more fruits and vegetables.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_125

LABORATORY ASSESSMENT FOR INDUSTRIALLY PRODUCED TRANS FATTY ACIDS (ITFA) TESTING CAPACITY IN ETHIOPIA

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BACKGROUND AND OBJECTIVES

Non-communicable diseases (NCDs) account for seven in ten deaths worldwide. In Ethiopia, NCDs are responsible for 48% of all deaths. An unhealthy diet, includes excess consumption of industrially produced trans fatty acids (iTFA), is a key risk factor for NCDs. In 2018, the World Health Organization (WHO) issued a global call to "eliminate iTFA by 2023". Ethiopia is considering adopting a best practice policy to eliminate iTFA from the food system. However, implementing effective control measures has been a key challenge due to the lack of laboratory capacity to analyze and detect industrially produced iTFAs. The objective of this study was to assess the capacity and capability of laboratories to analyze the iTFA content in food samples.

METHODS

The study involved both off-site and on-site assessments, including physical observations of the identified laboratories using a predetermined data collection tool, consultative discussions, and stakeholder consultations. A purposive sampling technique was employed to select sample laboratories from both the government and private sectors. The study aimed to assess the availability of equipment and consumables, the laboratories' accreditation status, the availability and capacity of personnel, the scope of tests, procurement processes, quality assurance practices, sample management, facility and environmental conditions, and safety precautions.

RESULTS

The study found that 67% of the laboratories had key equipment, such as GC-FID/GC-MS, for testing iTFA. Forty-four percent had well-equipped facilities with sufficient space and proper zoning. All laboratories had qualified staff, and 56% had established quality management systems. However, only 33% were accredited with ISO/IEC 17025:2017 by the Ethiopian Accreditation Service (EAS) with chemical and microbiological parameters, and none were specifically accredited for iTFA testing. Additionally, only three laboratories regularly operated GC equipment. Forty-four percent of the assessed laboratories met the minimum requirements for conducting iTFA analysis.

CONCLUSIONS

To support the enforcement of the iTFA elimination policy in the country, the four identified qualified laboratories could be made functional for iTFA detection in food matrices with minimal capacity-building support. This would include the provision of necessary consumables, assistance with obtaining ISO/IEC 17025:2017 accreditation for iTFA analysis, fostering interlaboratory collaboration, and establishing a robust monitoring system.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_126

INTAKES OF NUTRIENTS RELATED TO NON-COMMUNICABLE DISEASES IS ASSOCIATED WITH HIGHER CONSUMPTION OF ULTRA-PROCESSED FOOD AMONG ADULTS IN DAKAR, SENEGAL

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BACKGROUND AND OBJECTIVES

The Nutritional transition in Senegal, characterized by a shift in dietary patterns, is accompanied by a rising prevalence of non-communicable diseases (NCDs) such as obesity, diabetes and cardiovascular disease. According to the World Health Organization (WHO), NCDs are responsible for 74% of deaths worldwide and there is increasing evidence linking ultra-processed foods (UPF) – rich in fats, sugars, and salt but poor in essential nutrients – to the growing burden of these diseases. Although UPF consumption has been studied globally, its specific impact on nutrient intake within Senegalese context remains unexplored. Therefore, this study aimed to evaluate the contribution of UPF to dietary intakes of critical nutrients related to NCDs among adults living in urban Dakar.

METHODS

This cross-sectional study analyzed data from 301 urban adults in Dakar aged 18 to 69 years, targeted through a stratified two-stage cluster sample design. Dietary intakes of participants were assessed using a multi-stage 24-hour dietary recall and all the foods reported were categorized according to the NOVA classification. The nutrient composition of foods, including total fat, free sugars, sodium, potassium, protein and dietary fiber, was determined using nutritional labelling or nutritional composition tables. Multiple regression models adjusted for demographic factors were used to examine associations between terciles of UPF consumption and nutrient intakes and compliance to WHO dietary recommendations.

RESULTS

On average, unprocessed or minimally processed foods provided 56.9% of total energy intake (TEI), followed by processed culinary ingredients with 19.9% while UPF contributed to 17.4%. UPF contributed to 43% of free sugars, 26.9% of total fat, 24.4% of sodium, 24% of potassium, 18.9% of protein, 5.4% of dietary fiber and 5.2% of saturated fat intakes. For individuals, higher UPF consumption was associated with significantly higher intakes of total fat (β=26.9; $p<0.001$), free sugars (β=17.6; $p<0.001$), potassium (β=1.3; $p<0.001$) and protein (β=14.8; $p<0.01$). Greater consumption of UPF was positively associated with excessive intake of total fat (aOR=2.56; p=0.002) but a negative association was found with inadequate intakes of potassium (aOR=0.01; $p<0.001$) and protein (aOR=0.43; p=0.009).

CONCLUSIONS

Ultra-processed foods are not the main source of energy intake in Senegalese adults, but their consumption is a key factor in determining the nutritional quality of the diet. Indeed, these findings highlight the dual effect of UPF: exacerbating unhealthy nutrient intakes while slightly improving some beneficial nutrients such as potassium and protein intakes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_127

DIETARY RISK FACTORS FOR PARKINSON DISEASE

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BACKGROUND AND OBJECTIVES

Parkinson's disease (PD) is a disabling neurodegenerative disease affecting 1-5% of the older population (1). It is believed that environmental factors are the leading causes of PD, potentially via inducing cellular stress, mitochondrial dysfunction, and neuroinflammation, although the exact pathways remain unknown (2,3). Increasing evidence supports that boosting cellular levels of the coenzyme nicotinamide adenine dinucleotide (NAD) confers neuroprotective effects in both healthy aging and neurodegeneration states (4). The vitamin niacin is a dietary precursor of NAD. This suggests a potential role of niacin in the development of neurodegeneration; however, this has not been investigated.

METHODS

A prospective observational cohort study (n=4,000) will investigate the association between niacin intake and the risk for Parkinson's Disease. Parkinson cases will be identified by the unique prescription of levodopa, monoamine oxidase B inhibitors, and/or dopamine agonists obtained from the Norwegian prescription registry. Dietary data from a food frequency questionnaire will be analyzed following a nutrient-based approach and a food-based approach. Cox proportional hazards regression models with appropriate covariates will be used to investigate the association of niacin and tryptophan intake, intake of foods rich in niacin, and risk of PD using the date of first prescription of relevant medication as proxy diagnosis of PD.

RESULTS

We hypothesize that niacin and foods rich in niacin will be associated with a lower risk for Parkinson's disease. The RESULTS are expected to be ready in Spring 2025.

CONCLUSIONS

This is a novel approach to investigate the association between dietary factors and incident Parkinson disease. We expect new knowledge on the risk factors for this neurodegenerative disease, which may then, in the longer term, also allow better prevention and treatment.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_128

SALT AND SODIUM INTAKE IN BURKINA FASO: FINDINGS FROM A COMPREHENSIVE SURVEY AND IMPLICATIONS FOR PUBLIC HEALTH

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BACKGROUND AND OBJECTIVES
High sodium intake is a major risk factor for non-communicable diseases (NCDs) like cardiovascular diseases, causing millions of deaths annually worldwide. Sodium intakes in many countries are above the WHO recommendation of <2 g/day. Processed foods and condiments, which are major contributors to sodium intake, are increasingly consumed in low/middle-income countries. This study assessed sodium intake, high-salt food contributions, and the link between sodium and NCDs in non-pregnant women and men 15-59 years old in Burkina Faso.

METHODS
In 2023, we conducted a cross-sectional survey using stratified sampling covering all accessible areas in Burkina Faso. We used urinary biomarkers (sodium, creatinine) to assess total sodium intake and a combination of three dietary intake approaches (24-hour recall targeted to salt-rich foods, food frequency questionnaire for out-of-house composite dishes, and the household food purchase/adult-male-equivalent method for small commodity foods) to assess the relative contribution of different foods to total sodium intake. We measured visceral obesity, hypertension and urinary albumin to estimate the prevalence of kidney damage. Urinary potassium was measured to assess the potential positive effect on hypertension. We collected spot urine samples and additionally, a 24h urine sample from a sub-sample to validate spot urine sodium excretion in an African population.

RESULTS
Among 412 non-pregnant women and 316 men, mean sodium intake was high (women: 3.3 g/d; men: 2.8 g/d), with 69% of women and 62% of men exceeding the WHO recommendation. Household salt was the primary source of sodium contributing around 70% of total intake, with bouillon (10%) and snacks and out-of-house dishes (~10% each in men, and ~5% each in women) as secondary sources. Approximately 90% of participants showed a low daily potassium intake. The prevalence of hypertension was around 21% in men and 18% in women, with visceral obesity being more common in women (45% vs. 13%). We found no relationship between sodium intake and hypertension but participants with visceral obesity were more likely to be hypertensive, and participants with hypertension were more likely to suffer from kidney damage.

CONCLUSIONS
Strategies to reduce sodium and increase potassium intake, along with addressing visceral obesity are essential to prevent both cardiovascular diseases and kidney damage in Burkina Faso.

CONFLICTS OF INTERESTS
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EPO6_131

PLANT-BASED DIETARY PATTERN AND CARDIOVASCULAR RISK FACTORS: RESULT FROM CESCAS STUDY

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BACKGROUND AND OBJECTIVES
Despite the well-documented benefits of healthy plant-based diet (PBD) to reduce cardiovascular risk factors(CVRF), evidence is still scarce in Latin America (1). Therefore, this study explored the association between adherence toPBD patterns and CVRF in three Latin American countries.

METHODS
A cross-sectional design was conducted using baseline data of the CESCAS study (2), a population-based prospective cohort study conducted in four cities of Argentina, Chile and Uruguay. Dietary intake was assessed using a validated food-frequency questionnaire (FFQ), from which three PBD indices were calculated: an overall PBD (3), a healthful PBD (4), and an unhealthful PBD (4). The CVRF assessed included hypertension (SBP≥140mmHg or DBP≥90mmHg or receiving antihypertensive treatment), obesity (BMI≥30kg/m²) and central obesity; high LDL-cholesterol (≥100mg/dL); and diabetes (fast lycemia≥126 mg/dL o use of hypoglycemic agents). Logistic regression models were developed, adjusting for sociodemographic characteristics, total energy intake, and lifestyle factors. All analyses were conducted using STATA MP 17.

RESULTS
The study included 5167 participants (59.7% female;mean age 55.3 ±10.8 years). Higher adherence to theoverall PBD pattern was associated with a lower prevalence of obesity (OR 0.91; 95%CI 0.86-0.96), high LDL-cholesterol(OR 0.91; 95%CI 0.86-0.97), hypertension (OR 0.93; 95%CI 0.88-0.98), and central obesity (OR 0.91; 95%CI 0.86-0.96).Significant associations with high LDL-cholesterol were observed for the healthful PBD pattern (OR 0.93; 95%CI 0.88-0.99). Conversely, higher adherence to the unhealthful PBD pattern was associated with a lower prevalence of diabetes(OR 0.87; 95%CI 0.81-0.94).

CONCLUSIONS
These findings highlight the potential benefits of emphasizing healthy plant-based foods to reduce cardiovascular risk factors in Latin America. Promoting widespread adoption of healthy provegetarian diets should beconsiderated in future public health policies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_132

EXPOSURE TO FOOD MARKETING AND SUPPORT FOR REGULATORY MEASURES IN GHANA: INSIGHTS FROM A NATIONWIDE SURVEY

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BACKGROUND AND OBJECTIVES
Food marketing significantly influences dietary behaviors, particularly among children and adolescents. Unhealthy food marketing has been linked to poor dietary habits. Regulatory measures to address food marketing are essential for creating healthier food environments. We explore public exposure to food marketing activities and assessed support for food marketing regulations in Ghana.

METHODS
A cross-sectional survey was conducted across three selected regions of Ghana—Greater Accra, Ashanti, and Northern—each representing one of the country's three ecological zones. Participants, consisting of residents aged 18 and above were randomly selected, and a structured survey questionnaire was administered by trained interviewers. Data were collected from 2,468 participants to assess: (1) the frequency and types of exposure to food marketing activities, including TV advertisements, online and social media; and (2) public perceptions and levels of support for regulatory measures to restrict unhealthy food marketing. Descriptive analysis was conducted to summarize the findings from the data.

RESULTS
Our findings show that online platforms (56%) were the most commonly accessed media, followed by television (50%) and billboards (23%). Respondents reported frequent exposure to unhealthy food marketing, with television (44%) being the most prominent channel, followed by online platforms (37%) and billboards (32%). Over half of the participants reported never seeing advertisements for fruits (62%) or vegetables (60%) in the seven days prior to data collection. Marketing tactics like emphasizing taste and enjoyment (56%) and using celebrities or influencers (53%) were particularly effective. Despite high exposure to unhealthy food marketing, 85% of respondents supported regulations, with 80% favoring a ban on unhealthy food billboards near schools and 77% supporting restrictions during children’s TV viewing hours.

CONCLUSIONS
The study highlights widespread exposure to food marketing in Ghana and substantial public support for regulatory interventions to restrict unhealthy food advertisements. These findings underscore the urgent need for policymakers to prioritize regulatory measures as part of broader strategies to promote healthier diets and mitigate the rising burden of diet-related diseases.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_133

URBAN AND PERI-URBAN FOOD ENVIRONMENTS: A SYSTEMATIC SCOPING REVIEW OF EIGHT COUNTRIES

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BACKGROUND AND OBJECTIVES
Urban and peri urban (UPU) food environments (FE) are inundated with unhealthy, ultra-processed foods, contributing to a rise in overweight, obesity, and non-communicable diseases in almost all LMICs. Therefore, understanding the dynamics of urban FEs is critical to tailor interventions to curb the growing double burden of malnutrition (DBM). We conducted a systematic scoping review to assess the evidence on UPU FE in eight LMICs representing Asia (Philippines, Sri Lanka, Bangladesh), Africa (Kenya, Ghana, Ethiopia, Rwanda) and Latin America (Peru), including a review of evaluations of FE interventions.

METHODS
A systematic search of peer-reviewed journal articles was conducted in Scopus and Web of Science targeting the five most populated urban areas across eight focal countries. We synthesize the evidence over the past 20 years (January 2001–April 2023) and highlight gaps and areas for further investigation.

RESULTS
We screened 1,609 abstracts and extracted data from 251 studies. The evidence on urban food environments is growing. The average number of urban FE-related papers published annually increased from 2 articles (2001-2008) to 7 articles (2009-2016) and 25 articles a year between 2016-2022. The most studied urban FE dimensions were vendor and product properties and food availability. Most studies of vendor and product properties examined food safety challenges (71%). The availability of ultra processed foods in and around schools was studied across several countries. A wide range of indicators were used to capture vendor and product properties, marketing and regulation, desirability, and affordability. Measures to capture availability, prices, accessibility, stability, and convenience coalesced around a few common indicators. Seven urban FE interventions were evaluated with three identifying effective food safety interventions. Training vendors on food safety increased food handling practice and urban gardening reduced household food insecurity.

CONCLUSIONS
While the literature on UPU food environments is growing, there is ample room to build consensus around tools and metrics. We identify and recommend the use of common FE indicators relevant to urban areas and areas for future research. Working towards standardization or the common use of FE indicators could facilitate comparisons across settings. The evidence on FE interventions is still incipient – with the exception of food safety training – and begs the question of how to best develop innovative approaches to combating the growing urban DBM in LMICs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_134

ASSESSMENT OF PHYSICAL ACTIVITY LEVEL AND KNOWLEDGE OF HEALTHY EATING PATTERN IN INDIVIDUALS LIVING WITH OVERWEIGHT AND OBESITY

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BACKGROUND AND OBJECTIVES
The main behavioral risk factors for overweight and obesity are: unhealthy diet, alcohol consumption, nicotine abuse and low physical activity. The aim of the study is to assess the the level of physical activity and knowledge of a healthy eating pattern in individuals living with overweight and obesity from 19 to 60 years.

METHODS
Level of physical activity, diet, eating habits, knowledge of healthy eating were studied in not representative for the city of Sofia sample of 264 adults with different degrees of BMI, through a structured interview, International Physical Activity Questionnaire (IPAQ) and questionnaires on the health status, knowledge of a healthy eating pattern and lifestyle. Anthropometric indicators and indices measure nutritional status, and bioelectrical impedance analysis determine body composition and distribution (Tanita BC 420 MA).

RESULTS
Significantly healthier eating pattern (with breakfast [91.7% vs. 78.6%, ($p<0.05$)], three-time meal pattern [(36.1% vs. 18.8%, respectively, ($p<0.05$)], choosing more fresh fruits and vegetables [94,4% vs. 80,2%, ($p<0.05$)]) was observed in participants with normal weight compared to those with overweight and obesity. Overweight and obese individuals had a higher relative proportion of low level of physical activity compared to those of normal body weight [81.3% vs.76.4%, ($p=0.392$)].

CONCLUSIONS
Individuals with a normal BMI follow a significantly healthier diet, have better knowledge about healthy eating and body weight control approaches compared to individuals living with overweight and obesity, but no statistically significant difference was found in terms of their levels of physical activity.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_135

VIRGIN FLAXSEED OIL, TOCOPHEROLS AND PHYTOSTEROLS PREVENTED THE NAFLD DEVELOPMENT AND FREE CHOLESTEROL ACCUMULATION IN RATS FED HIGH FAT DIETS

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BACKGROUND AND OBJECTIVES

Non-alcoholic fatty liver disease (NAFLD) is characterized by excessive liver triacylglyceride (TAG) accumulation in the absence of alcohol consumption and can progress to non-alcoholic steatohepatitis (NASH), involving inflammation, oxidative stress, and fibrosis. Free cholesterol (CHO) accumulation may contribute to the development of these conditions, and diet composition plays a critical role in either promoting or preventing this progression. Flaxseed (F) oil, rich in α-linolenic acid (ALA), and deodorizer distillates (DD) from sunflower oil, which contain tocopherols (TP) and phytosterols (PS), may help mitigate hepatic steatosis, inflammation, and NASH. This study aimed to investigate the potential of functional lipids (FL) present in DD to prevent NAFLD development in rats fed high-fat diets containing different linoleic acid (LA)/ALA ratios.

METHODS

Male Wistar rats (100 g BW) were divided into 7 groups and fed experimental diets with different fat levels (7% or 30% w/w), fat sources (soy -S-, corn -C-, or F), and DD supplementation: S7, S30, C30, F30, S30DD, C30DD, and F30DD, for 60 d. We assessed: BW gain, tissue lipid levels, fatty acid (FA) uptake and β-oxidation in the liver, gene expression related to FA transport and β-oxidation, liver cholesterol (CHO) homeostasis, glucose levels, hepatic VLDL-TAG secretion rate, liver histology, and TBARS levels.

RESULTS

S30 vs S7 showed increased BW gain, adipose tissue accumulation, glucose intolerance, and elevated TAG and free CHO levels in the liver, with ballooned hepatocytes, likely due to excessive FA influx, which is not balanced by and increase in β-oxidation. C30 group exhibited greater liver inflammation vs S30. F30 and F30DD attenuated BW gain, reduced adipose tissue, improved glucose levels, and showed normal histological features, lower hepatic TAG accumulation, linked to enhanced β-oxidation, increased CPT-1a activity, and upregulated β-oxidation-related gene expression. Both total and free CHO levels were reduced in the F30, reflecting increased CHO excretion and metabolism. DD supplementation improved β-oxidation, reduced hepatic CHO, slightly increased VLDL-TAG secretion, and decreased liver TBARS levels.

CONCLUSIONS

Virgin flaxseed oil, with or without TP and PS, effectively prevented TAG and free CHO accumulation in the liver. DD supplementation contributed to improved oxidative status. These findings suggest that FL from plant sources, such as a mixture of flaxseed oil, TP, and PS, could be promising dietary treatments for preventing NAFLD.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_136

NOVA DIET QUALITY SCORES AND INCIDENCE OF HYPERTENSION IN THE NUTRINET-BRASIL COHORT STUDY

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BACKGROUND AND OBJECTIVES
Hypertension is the leading cause of premature death worldwide (1). Unhealthy diets, such as those rich in ultra-processed foods (UPFs), are a major risk factor, while diets rich in unprocessed or minimally processed foods, especially whole plant-based foods (WPFs), have been linked to a reduced risk of hypertension (2-4). This study aims to assess the prospective association between the WPFs and UPFs Nova scores and the incidence of hypertension.

METHODS
NutriNet-Brasil is a web-based cohort study launched on January 26, 2020, with over 100,000 participants (5). The present study included 16,202 participants aged 18 or older, residing in Brazil, who were free of hypertension at baseline, had their blood pressure measured at least twice (both prior to and during follow-up), and completed at least three of five previously validated Nova 24-hour dietary recall screeners (6) at baseline. The Nova-WPF and Nova-UPF scores are calculated by summing the positive responses for the intake, on the previous day, of 33 varieties of unprocessed or minimally processed foods and 23 varieties of UPFs, respectively, and averaging across all completed screeners (from 3 to 5) (6). Incident cases of hypertension included individuals who reported a medical diagnosis of hypertension during follow-up. Baseline variables used for adjustments included age (as timescale), sex, education, ethnicity, living status, income source, smoking, alcohol consumption, physical activity, sleep duration, and family history of hypertension, diabetes, hypercholesterolemia, cardiovascular disease, and cancer. Cox proportional hazard models were used to estimate the hazard ratios (HR) and 95% confidence intervals (95% CI).

RESULTS
Over 22.8 months, 1,081 incident cases were identified. Individuals in the highest Nova-WPF quintile had a 42% lower risk of hypertension (HR, 0.58; 95% CI, 0.48-0.71) compared to those in the lowest quintile. Individuals in the highest quintile of Nova-UPF had a 92% greater risk of hypertension (HR, 1.92; 95% CI, 1.58-2.34). A linear trend in the association was observed for both dietary scores ($p<0.001$). In addition, the associations persisted after adjusting for the alternative score.

CONCLUSIONS
The Nova-WPF and the Nova-UPF dietary quality scores were associated with lower and higher risks of hypertension, respectively. Our RESULTS support the use of these scores in diet quality monitoring systems and facilitate the communication with policymakers.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_138

BENEFITS OF A NUTRITIONAL INTERVENTION IN PATIENTS WITH HEAD AND NECK CANCER

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BACKGROUND AND OBJECTIVES

Identify the benefits of nutritional intervention for patients with head and neck cancer.

METHODS

The search for articles published in the different databases showed a total of 260 articles in a period of time from February to September 2023, which are distributed as follows: BVS 94 articles, PubMed 25 articles, Scielo 11 articles, Embase 39 articles and Cochrane 91 articles.
The following combinations were used for the search strategy: Head and neck cancer and nutritional support ("Head AND neck neoplasms AND nutritional support"), Head and neck neoplasms AND payhway of feeding OR diet OR nutritional support ("Head and neck neoplasms AND payhway of feeding OR diet OR nutritional support"), Head and neck cancer and nutritional assessment or clinical deterioration and enteral nutrition ("Head an neck neoplasms AND nutrition assessment OR clinical deterioration AND enteral nutrition"), Nutrition assessmente AND head an neck neoplasms AND diet ("Nutrition assessmente AND head an neck neoplasms AND diet"), Head and neck cancer and nutritional assessment and diet ("Headn neck neoplasms AND nutrition assessment AND diet"), Head and neck cancer and enteral nutrition ("Head and neck neoplasms AND enteral nutririon")

RESULTS

According to the RESULTS obtained, an improvement is observed in the nutritional status of patients with respect to early nutritional intervention, since there are different signs and symptoms secondary to antineoplastic treatment, which can affect food consumption and tolerance. In addition, it is extremely important to be able to identify them in order to make a decision regarding nutritional intervention.
Nutrition in patients with head and neck cancer should be of utmost importance. It is mentioned that a diet containing foods rich in antioxidants can be of great help, since these can reduce the toxicity of oncology therapies.
Regarding the feeding routes used in patients with head and neck cancer, the main ones are nasogastric tube and percutaneous endoscopic gastrostomy, both of which can be of greater benefit in weight gain and improving the quality of life of patients. However, maintaining an NGT requires greater care at home compared to a PEG.

CONCLUSIONS

Early nutritional treatment can help prevent nutritional deterioration in patients and, at the end of oncological treatment, continue nutritional support until an adequate improvement in the patient's nutritional status is observed.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_139

IMPACT OF ULTRA-PROCESSED FOOD CONSUMPTION ON WEIGHT OUTCOMES IN WOMEN WITH GESTATIONAL DIABETES MELLITUS: A COHORT STUDY

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BACKGROUND AND OBJECTIVES

Although the literature presents the negative health consequences of consuming ultra-processed foods (UPF) in relation to adiposity and the development of chronic non-communicable diseases, there is still a scarcity of studies evaluating the impact of this consumption during the gestational period, especially on obstetric and perinatal outcomes in women with high-risk pregnancies. Therefore, the aim of this study was to assess the impactof UPF consumption on weight outcomes in women with Gestational Diabetes Mellitus (GDM).

METHODS

This was an observational, prospective cohort study of 140 women diagnosed with GDM and treated at a reference maternity hospital in northeastern Brazil. The study lasted an average of 25 weeks with three collections: T1: between the 1st and 2nd trimester, T2: in the 3rd gestational trimester and T3: in the immediate postpartum period. Data collection included sociodemographic characteristics, clinical and obstetric data, anthropometric data and food consumption. Food consumption was obtained by 24-hour recall and food categorized according to the Nova classification. Weight outcomes were assessed by gestational weight gain (GWG) at T1 and T2 and final GWG (T3). Women were grouped according to tertiles of UPF consumption in grams. The RESULTS of the multiple linear regression models were analyzed to as certain the association between UPF consumption in grams and weight outcomes, with adjustments for confounding variables.

RESULTS

Energy consumption was 1960.72 (±460.74) calories, with a UPF contribution of 17.95% (95% CI = 16.24 - 19.66), with an intake corresponding to 131.43 (IQR = 90.50 - 200.11) grams per day. Most of the women started pregnancy obese (57.10%). GPG at T1 and T2 represented a rapid cumulative gain in 57.10% and 47.60% of the pregnant women, respectively. The final GWG (T3) was 6.86 (±6.78) kg, with the majority of women having a high GWG (50.70%). The multiple linear regression models showed a positive relationship between a greater share of UPF in grams and cumulative and final GWG ($\beta = 0.014$; $p= 0.002$ and $\beta = 0.015$; $p = -0.023$, at T1 and T3, respectively).

CONCLUSIONS

RESULTS suggest that UPF consumption should be discouraged during high-risk pregnancy.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_140

PUBLIC SUPPORT TOWARDS A DOUBLE-DUTY FOOD-BASED POLICY BUNDLE TO COMBAT DIET-RELATED NCDS IN GHANA

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BACKGROUND AND OBJECTIVES

The changing food environment, characterized by increased availability, accessibility and affordability of energy dense, nutrient poor foods, is a key driver of rising rates of obesity and diet- related non-communicable diseases (NCDs). While a growing body of evidence supports various food environment policies to address these issues globally, public support is crucial for their effective development and implementation. The study aimed to examine public support for a range of policies aimed to address unhealthy food environments in Ghana.

METHODS

The study was a nation-wide cross-sectional study involving about 2468 aged 18 years and above. A multistage stratified sampling approach was used to select study participants. Data was collected through face-face interviews using tablets and analyzed descriptively.

RESULTS

The study revealed strong public support for various policies (front-of-package labeling, marketing restrictions, public food procurement regulations, and fiscal policies), with 60% or more of respondents expressing approval. Subsidies on healthy foods (98%) and front-of-package labeling policies received the highest support. Additionally, 90% favored government-funded TV campaigns highlighting the risks of unhealthy foods. Policies restricting the sale of unhealthy foods in public institutions (80%) and near schools (82.5%) or hospitals (86%) were widely supported. Fiscal measures, such as taxing unhealthy foods, had 74.1% approval, rising to 84.3% if revenues were used to subsidize healthy foods. Marketing restrictions, though slightly less popular, still had considerable backing, with support ranging from 67.1% to 77.1% for measures like banning celebrity endorsements, limiting fast-food outlets near schools, and restricting ads during children's viewing hours.

CONCLUSIONS

This study underscores substantial public support for government-led policy initiatives aimed at improving unhealthy food environments and encouraging healthier dietary choices. Policymakers can capitalize on this support to design, implement, and enforce robust policies that tackle the underlying causes of poor dietary patterns.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_141

GENDER DIFFERENCES IN THE RISK OF ALZHEIMER'S DISEASE AND VASCULAR DEMENTIA AMONG ASIAN INDIVIDUALS WITH TYPE 2 DIABETES MELLITUS: A MINI SYSTEMATIC REVIEW

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BACKGROUND AND OBJECTIVES
Type 2 diabetes mellitus (T2DM) is associated with an increased risk of dementia, including Alzheimer's disease (AD) and vascular dementia (VD) (Seo et al., 2024). While studies have highlighted gender differences in dementia risk among individuals with T2DM (Arenaza-Urquijo et al., 2024)., the extent and underlying causes of these disparities remain unclear.

METHODS
A comprehensive search was conducted between 2014 and 2024 across Scopus, PubMed, Google Scholar, and ScienceDirect, following PRISMA guidelines, resulting in the selection of nine peer-reviewed studies from Korea, India, and Japan that focused on T2DM and dementia, specifically gender differences in AD and VD. Studies were chosen based on gender-specific analysis of cognitive decline and dementia, considering age and early-onset diabetes, while excluding non-English publications, studies without gender analysis, non-Asian populations, and animal research. Key search terms included "T2DM," "AD," "VD," "gender differences," and "Asian populations."

RESULTS
Several studies highlight a gender disparity in dementia and cognitive impairment risk among individuals with T2DM, particularly in Asian populations. A 2024 Korean study found women diagnosed with T2DM before age 50 had a significantly higher risk of AD and VD compared to men, with AD risk 5.6 times higher and VD risk 6.5 times higher. In contrast, men showed a 3.3-fold increase in AD and a 5.5-fold increase in VD risk. Similarly, a 2021 Indian study found female T2DM patients had a higher incidence of mild cognitive impairment (MCI) and a 2.34-fold increased risk of VD. Research from Korea (2019) and Karnataka, India (2019) also showed higher dementia rates in women, particularly for AD, and a higher prevalence of cognitive dysfunction in older women. A 2019 Japanese study confirmed these findings, showing higher dementia incidence in women with T2DM. These studies collectively emphasize the heightened risk of dementia and cognitive decline in Asian women with T2DM.

CONCLUSIONS
This review highlights significant gender differences in AD and VD risk among Asians with T2DM, with women, especially those with early-onset diabetes or older age, at higher risk. The findings stress the need for targeted interventions for early diagnosis and prevention. Further research is required to understand the mechanisms behind this disparity and develop strategies to reduce dementia risk in women.

CONFLICTS OF INTERESTS
No Conflicts of interest

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EPO6_143

ANALYSIS ON THE STATUS OF EATING OUT AND THE INFLUENCING FACTORS OF OVERWEIGHT AND OBESITY AMONG SCHOOL CHILDREN AGED 6 TO 17 IN BEIJING

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BACKGROUND AND OBJECTIVES
To investigate the status quo of eating out and the influencing factors of overweight and obesity among school children aged 6 to 17 years in Beijing.

METHODS
Based on the data of school children aged 6-17 years in Beijing during the Nutrition and Health Monitoring of children and nursing mothers in China from 2016 to 2017, the current situation of eating out and the influencing factors of overweight and obesity were analyzed.

RESULTS
In Beijing, the proportion of school children aged 6 to 17 years old eating out for breakfast, lunch and dinner was 42.2%, 80.5% and 32.5%, respectively, with the highest proportion eating out for lunch.The proportion of eating out for breakfast, lunch and dinner was related to parents' employment status, parents' education level, meeting the recommended daily physical activity and snacks. In terms of eating out places, Takeaways and Chinese restaurants are the most common places to eat out. The overweight/obesity rate of school children aged 6 to 17 years old in Beijing was 7.7%, and boys (11.1%) were higher than girls (4.3%). The RESULTS of multivariate logistic regression analysis showed that boys were the influencing factor of overweight/obesity in school children (OR=2.64, P<0.05).

CONCLUSIONS
We will actively promote the construction of healthy canteens and restaurants, promote nutritious meals throughout society, and cultivate healthy lifestyles for school-age children and their parents to ensure their healthy growth.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_146

RELATIONSHIP BETWEEN DIETARY INTAKE, TRIGLYCERIDE-GLUCOSE INDEX AND TRIGLYCERIDE TO HDL CHOLESTEROL RATIO AS PREDICTORS OF CARDIOVASCULAR DISEASE

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BACKGROUND AND OBJECTIVES
The Triglyceride-Glucose Index (TyG) and the Triglyceride to High-Density Lipoprotein Cholesterol ratio (TG/HDL-C) have been identified as potential biomarkers for insulin resistance and were associated with cardiovascular disease. However, their relationship with dietary intake remains unexplored. We aimed to evaluate the relationship between added sugar, total sugar, and fat intake with the TyG index and the TG/HDL-C ratio

METHODS
We conducted a cross-sectional study including adult volunteers, both teaching and non-teaching staff from a national university. Participants completed a sociodemographic questionnaire, and measurements of weight, height, and waist circumference were taken. Biochemical assessments were performed, and the TyG index, TG/HDL-C ratio and Atherosclerotic Cardiovascular Disease (ASCVD) lifetime risk were calculated. Dietary intake was assessed through four 24 hours dietary recalls. Statistical analysis was performed using the SPSS software.

RESULTS
A total of 80 volunteers (40.4±10.5y), 76.3% (95%CI;65.8-84.2%) female, were included. Prevalence of overweight was 51.3% (95%CI;40.5-61.9%). The mean daily intake of total sugar, added sugar, and fat was 79.7 g/day, 48.0 g/day, and 82.1 g/day, respectively; 41.3% of participants exceeded the WHO recommendation for added sugar consumption. 38.8% had hypercholesterolemia, 12.5% had hypertriglyceridemia and 30.0% had fasting glucose greater than 100 mg/dL. The average TyG index and TG/HDL-C ratio were 8.32±0.44 and 1.64±0.40, respectively; the average ASCVD risk was 27.5%. Neither the TyG index nor the TG/HDL-C ratio were associated with added sugar intake (p=0.08, p=0.078), total sugar intake (p=0.38, p=0.32), fat intake (p=0.32, p=0.48) or ASCVD risk (p=0.06, p=0.28), even after adjusting for confounding variables.

CONCLUSIONS
Added sugar, total sugar and fat intake were not associated with the TyG index, the TG/HDL-C ratio or the ASCVD lifetime risk in the studied population. Further dietary assessments in larger cohorts are needed to confirm these findings.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_147

THE EFFECT OF BLUEBERRY SUPPLEMENTATION ON INTRA-ARTICULAR INFLAMMATION AND POST-OPERATIVE RECOVERY IN PATIENTS UNDERGOING TOTAL KNEE REPLACEMENT FOR OSTEOARTHRITIS

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BACKGROUND AND OBJECTIVES

Osteoarthritis (OA) is a painful, chronic condition affecting 40% of those >70 years [1]. There remain no treatment strategies to prevent disease progression [2]. Inflammation is an important aetiological factor in the development of OA [3]. Previously, blueberry supplementation reduced arthritic pain [4] potentially via anti-inflammatory action. This study assessed the effect of blueberry supplementation on a) the inflammatory pathophysiology of OA and b) pre- and post-surgical pain and joint function in patients undergoing total knee replacement (TKR) surgery for OA.

METHODS

Patients undergoing TKR for OA were randomised to consume 40g (~429 mg anthocyanins) per day of freeze-dried blueberry (n=15, 69 ± 9 years, 33.8 ± 5.4 kg.m2) or placebo powder (n=16, 71 ± 8 years, 32.5 ± 5.6 kg.m2) 6-weeks pre- and post-TKR. Serial WOMAC (Western Ontario and McMaster Universities Arthritis Index) assessments were conducted three times pre- and post-TKR. Synovial fluid (SF) and synovium was collected from patients during their TKR. Cytokine and chemokine concentrations (CCL2, insulin, gp130, MMP1, CCL20, galectin-1, IL15, chemerin, IL6) in SF were measured using multiplex technology. CD206 was measured via ELISA in synovium lysates. Between group differences were tested using MANOVA, repeated measures ANCOVA and independent t-test.

RESULTS

A Principal Component Analysis (PCA) reduced the dimensionality of SF outcome measures (CCL2, CCL20 insulin, gp130, MMP1, CCL20, galectin-1, leptin IL15, chemerin, IL6, IL18), capturing key variations. A MANOVA using the first two principal components (PC1: 25.2%, PC2:13.3% variance) showed a significant ($F(2,28)=3.936$, $p=0.031$) difference in cytokine milieux between blueberry and placebo groups. Blueberry-supplemented SF contained less gp130 than those of placebo controls (blueberry 48.2 ± 16.2 ng/mL, placebo 59.2 ± 8.6 ng/mL; $p = 0.03$). There were no significant differences in CD206, (blueberry 230 ± 85 ng/mL, placebo 146 ± 123 ng/mL $p=0.06$). There was no significant interaction effect between supplementation group and WOMAC scores pre- or post-TKR ($F(2,52)=1.503$, $p=0.232$, $\eta p2 =0.055$ and $F(2, 50)=0.259$, $p=0.760$, $\eta p2=0.10$ respectively).

CONCLUSIONS

Longer-term blueberry supplementation could ameliorate OA pathology. Reduction in gp130 may be representative of improved tissue repair and reduced OA disease severity [5]. Dietary supplementation with blueberry may represent a useful tool for OA treatment.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_148

VALIDITY OF FASTING PLASMA GLUCOSE IN REFERENCE TO HBA1C FOR THE DETECTION OF DIABETES IN AN OVERWEIGHT AND OBESE POPULATION IN SRI LANKA

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BACKGROUND AND OBJECTIVES
Validity of fasting plasma glucose (FPG) measurements for the detection of diabetes was evaluated in reference to HbA1c among a 35-64-year-old, overweight and obese population.

METHODS
Data were collected from 1200 adults aged 35-64 years having a BMI of 25 kg/m2
Sensitivity, specificity and ROC analyses were performed on 1121 persons for FPG (the index test) and HbA1c (the reference standard). HbA1c ≥6.5% was considered as having diabetes

RESULTS

Approximately 64% were female, 73% employed, 31% BMI ≥30 kg/m2, and 70% living in urban settings. Mean age (SD) was 47.8 (±7.5) years.
Prevalence of diabetes was 25.7% according to HbA1c ≥ 6.5%, and 44% of them were undiagnosed. A significant correlation was found between FPG values and HbA1c (r=0.863; p<0.001). At FPG cutoff point of 126mg/dl, the sensitivity was 60% (95%CI: 53.6, 65.5), and the specificity 99.8% (95%CI: 99.4, 100.1), with high agreement (kappa=0.69; p<0.001). The positive and negative predictive values were 98.7% (96.9, 100.5) and 89.3% (87.4, 91.3), respectively. At FPG 100mg/dl, the sensitivity increased to 82.0% (77.2, 86.7) and specificity reduced to 88.5% (86.2, 90.7), with a marginal change in kappa (0.66; p<0.001). ROC analysis found an area of 0.91 (p<0.001) under the curve at this optimum cutoff point.

CONCLUSIONS
A lower threshold of FPG (≥100 mg/dl) may achieve a maximum yield of diabetes during the screening of overweight or obese persons in the age group 35-64 years.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_149

COUNTRY-SPECIFIC DIFFERENCES IN THE ASSOCIATION BETWEEN DIETARY INTAKE AND OBESITY IN TWO HIGH-INCOME COUNTRIES: THE PROSPECTIVE URBAN AND RURAL EPIDEMIOLOGY (PURE) STUDY

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BACKGROUND AND OBJECTIVES
A healthy diet is associated with a reduced risk of obesity in adults (1). Canada and Sweden are two high-income countries with many similarities, yet the prevalence of obesity is significantly higher in Canada. This study aimed to investigate country-specific differences in associations between dietary intake and obesity.

METHODS
We included 6,008 men and women aged 34 to 60 years with normal weight (body mass index [BMI]: 18.5-<25 kg/m2 or obesity (BMI>30 kg/m2) from the Prospective Urban Rural Cohort Epidemiology (PURE) study (2), with participants from Canada (n=4124, 45% women) and Sweden (n=3,172, 46% women). The Alternative Healthy Eating Index (AHEI)-2010 score (3) was calculated from country-specific food frequency questionnaires. The AHEI score is based on 11 components: vegetables, fruit, whole grains, nuts and legumes, long chain omega–3 fats, and polyunsaturated fatty acids, sugar-sweetened drinks and fruit juice, alcohol, red and processed meat, *trans*-fats, and sodium. Each component scored from 0 to 10, with a maximum total score of 110, where higher scores indicate healthier diets. Logistic regression models with 95% confidence intervals (CIs), adjusted for sex and age, were used to estimate ORs of obesity (BMI≥30) in both countries across AHEI score quintiles (Q). Contrast matrices were used to compare ORs between countries.

RESULTS
The prevalence of obesity was higher in Canada (42.1%) than in Sweden (27.3%) (OR 1.98, CI 1.76-2.24). Still, having a healthy diet was more common in Canadian, compared with Swedish participants, with a mean AHEI score of 60.1 (standard deviation [SD]=13.4) and 56.3 (SD=11.2), respectively. Odds of obesity decreased linearly with higher AHEI scores in both countries. A significant interaction between country and AHEI score was observed. Compared with Swedish participants (Q1 as a reference), Canadian participants had increased odds of obesity across Q1 to Q3, with ORs: Q1=2.40 (CI=1.83-3.14), Q2=1.95 (CI=1.50-2.53, and Q3=1.64 (CI=1.26-2.13). For Q4 and Q5, Canadians had similar or lower odds compared with Swedish participants in Q1 (ORs: Q4=0.90 (CI=0.69-1.17 and Q5=0.40 (CI=0.31-0.53)).

CONCLUSIONS
Despite an overall healthier diet, Canadians had a higher prevalence of obesity compared to Swedish participants. Canadians also had higher odds of obesity compared with Swedish participants across AHEI scores. These data suggest that differences in diet quality between countries do not explain country-level differences in obesity prevalence or risk.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_150

EFFECTS OF HEPATIC WDR6 SIRNA ADMINISTRATION ON THE PATHOGENESIS OF NON-ALCOHOLIC STEATOHEPATITIS/METABOLIC DYSFUNCTION-ASSOCIATED STEATOHEPATITIS (NASH/MASH) IN MICE

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BACKGROUND AND OBJECTIVES
WD repeat protein 6 (WDR6) is known to be expressed at a low level in the brains of long-lived rats. Previous studies have shown that WDR6 is involved in the insulin/insulin-like growth factor-1 (IGF-1) signaling pathway. Hence, WDR6 may be implicated in the regulation of feeding behavior and lifespan. Additionally, WDR6 positively regulates intracellar signaling pathways associated with lipid accumulation. Therefore, the liver-specific inhibition of WDR6 function would be expected to suppress lipid accumulation in the liver and inhibit the progression of non-alcoholic steatohepatitis / metabolic dysfunction-associated steatohepatitis (NASH/MASH).

METHODS
C57BL/6J mice were fed a choline-deficient, methionine-reduced, high-fat diet (CDAHFD) to induce NASH/MASH, and *Wdr6* siRNA was injected into the liver via a tail vein to determine the effects of *Wdr6* inhibition on the progression of NASH/MASH. Liver tissue samples were stained with hematoxylin/eosin or Sirius Red or subjected to F4/80 immunostaining. Lipids were extracted from the liver, and the triglyceride (TG) and total cholesterol (TC) levels were quantified. The plasma concentrations of TG and TC and the activity of alanine aminotransferase (ALT) were measured by colorimetric assays. Additionally, quantitative PCR was performed to measure gene expression levels in the liver.

RESULTS
Liver mass was significantly lower in the *Wdr6* siRNA-treated group (SI) than in the negative control group (NC). The SI group showed significantly lower expression of genes involved in various pathologic features of NASH/MASH, including hepatocellular injury, lipid accumulation, inflammation,proinflammatory cytokines,anti-inflammatory cytokines, fibrosis, and adipogenesis regulation and lower hepatic TG and TC levels *vs*. the NC group. In contrast, the SI group exhibited significantly higher expression of genes involved in fatty acid β-oxidation, anti-inflammatory regulation,and cholesterol efflux to bile *vs*.the NC group.

CONCLUSIONS
These RESULTS suggest that *Wdr6* siRNA administration promotes fatty acid β-oxidation via PPARα and suppresses lipid synthesis through PPARγ1. Furthermore, *Wdr6* siRNA may attenuate the progression of liver inflammation and fibrosis through cholesterol efflux to bile. Therefore, WDR6 may be an important therapeutic target for NASH/MASH.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_151

THE EFFECTS OF 6 MONTHS DIETARY COUNSELING ON DIET QUALITY AND CARDIOVASCULAR RISK PROFILE IN PATIENTS WITH CARDIOVASCULAR DISEASE: A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
Despites the known benefits of a healthy diet for cardiovascular disease (CVD) risk factors, dietary counseling is not yet widely implemented in health care for patients with CVD. The aim of the current trial was to investigate how dietary counseling by a dietitian, focused on improving diet quality, influenced the cardiovascular risk profile of patients with established CVD.

METHODS
In this 6-month trial, 124 patients with CVD (68.1 ± 9.5 years, 72% men) were randomly assigned to counseling by a dietitian (n=63) or usual care (n=61). Differences in cardiovascular risk profile between groups were assessed with a 10-year composite cardiovascular risk prediction score that incorporated changes in blood pressure and low-density lipoprotein cholesterol (LDL-C). Changes in self-reported diet quality were assessed as secondary outcomes by use of the Dutch Healthy Eating Index-2015 (DHD15-index) that ranges from 0-160 with higher scores indicating higher diet quality. Also, changes in LDL-C, systolic blood pressure, body weight, and high-sensitivity C-reactive protein [hs-CRP]) were investigated as secondary outcomes. Analysis of covariance was used to compare 6-month values between groups, with analyses being adjusted for baseline values and factors that were used to stratify randomization.

RESULTS
Patients in the intervention group met on average 6 times (IQR 4-7) with the dietitian. Baseline estimated 10-year CVD risk was 24.3 ± 15.6 % in the usual care group and 23.3 ± 15.3 % in the intervention group. At six months, the absolute difference in 10 year CVD risk between groups was 1.9 % (95%CI: -2.8%; 6.5%), which was not statistically significant. The DHD15-index at baseline was 102 ± 22 in the usual care group and 104 ± 16 in the intervention group. At 6 months, the index was 5.7 points higher in the dietary counseling group compared to the usual care group (95%CI: 1.3; 10.1). However, no differences in LDL-C (-1.5 mmol/l, 95%CI: -7.1; 4.1), blood pressure (0.0 mmHg, 95%CI: -0.2; 0.2), body weight (-0.7 kg, 95%CI: -2.9; 1.5) or hs-CRP (0.71 mg/dl, 95%CI: -1.20; 2.62) between groups were found.

CONCLUSIONS
In this trial, dietary counseling for patients with CVD slightly improved self-reported adherence to a healthy diet in patients with established CVD. The counseling did not result in substantial differences in cardiometabolic risk profile after 6 months.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_152

HUMAN HEALTH RISK ASSESSMENT OF ARSENIC IN DRINKING WATER IN AUTONOMOUS PROVINCE OF VOJVODINA

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BACKGROUND AND OBJECTIVES

45% of the seven districts of the Autonomous Province of Vojvodina (APV) population are forced to use non-purified disinfected or undisinfected drinking water (NPDW), where arsenic represents one of the hazards. The objective is to assess the human health risk caused by arsenic concentration in drinking water in municipalities without appropriate treatment.

METHODS

The analyses are based on the RESULTS from 2023 for 11.919 NPDW samples originating from seven authorized and accredited public health institutions. Drinking water safety was assessed according to national laws. Total cancer risk (TCR) was characterized using the United States Environment Protection Agency methodology, considering ingestion and dermal absorption for adults and children up to 5, and with acceptability at E-4 to E-6.

RESULTS

Regarding arsenic concentration, 69% of NPDW samples were not in compliance in all seven districts of APV, with an average concentration of 0.08 mg/l and a maximum of 0.94 mg/l. TCR concerning ingestion and dermal absorption, with the dominance of ingestion (99%) for maximum arsenic concentration was not acceptable in six of seven districts (from 3,65E-02 to 7,80E-03) for adults. As for children up to 5, TCR was not acceptable in all seven districts regardless of average or maximum arsenic concentration (from 6,36E-02 to 8,23E-03 for average and from 1,88E-01 to 6,53E-03 for maximum concentration).

CONCLUSIONS

The NPDW in APV due to arsenic concentration poses significant human health risks, especially for children under 5. It underscores the urgent need for local governments to provide safe drinking water to every citizen of APV.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_153

DIETARY CHOLEST-4-EN-3-ONE ALLEVIATES OBESITY-RELATED METABOLIC DISORDERS IN OBESE DIABETIC MICE

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BACKGROUND AND OBJECTIVES
Cholest-4-en-3-one (4-cholestenone, 4-STN) is a steroid that has an oxo group at the carbon-3 (3-oxo) position and a double bond at the carbon-4 position. Previous studies have shown that dietary 4-STN exerts anti-obesity and lipid-lowering effects in mice. However, its underlying mechanisms are not fully understood. In the present study, we evaluated whether 4-STN supplementation would protect obese diabetic *db/db* mice from obesity-related metabolic disorders.

METHODS
Five-week-old male C57BL/6J and *db/db* mice were housed individually in plastic cages in a temperature-controlled room. The experimental diets were prepared according to the AIN-76 formula with several modifications. *db/db* mice were assigned to two groups (n = 6/group) that were fed one of the following diets: a control diet containing 7% soybean oil and 0.1% cholesterol (CON group) or control diet supplemented with 0.25% 4-STN at the expense of sucrose (4-STN group). C57BL/6J mice (n = 6), which are the progenitors of *db/db* mice, were fed a control diet (NOR group). After 3 weeks of feeding experimental diets, respiratory gas analysis was conducted. After 4 weeks of feeding, the mice were sacrificed by exsanguination from the heart, and then obtained samples were analyzed.

RESULTS
There was no significant difference in food intake, final body weight, total oxygen consumption, energy expenditure, or carbohydrate oxidation. On the other hand, dietary 4-STN markedly alleviated hyperlipidemia, hepatic cholesterol accumulation, and hyperinsulinemia in *db/db* mice. However, the effect of dietary 4-STN was not sufficient to improve hepatic triglyceride accumulation or obesity in *db/db* mice. Further analysis demonstrated that dietary 4-STN significantly increased the content of free fatty acids and neutral steroids in the feces of *db/db* mice, indicating that the alleviation of hyperlipidemia by 4-STN was due to increased lipid excretion. In addition, dietary 4-STN significantly reduced the levels of desmosterol, a cholesterol precursor, in the plasma but not in the liver, suggesting that normalization of cholesterol metabolism by 4-STN is partly attributable to the suppression of cholesterol synthesis in extrahepatic tissues.

CONCLUSIONS
These RESULTS indicate that dietary 4-STN ameliorates obesity-related metabolic disorders such as hyperlipidemia, hepatic cholesterol accumulation, and hyperinsulinemia, in *db/db* mice.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_154

EXPLORING THE ASSOCIATION BETWEEN DIETARY PATTERNS AND DIABETES AMONG THE POPULATION THROUGH THE NUTRITION AND HEALTH SURVEY IN TAIWAN (NAHSIT)

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BACKGROUND AND OBJECTIVES
Studies show that about 8.3% of adults worldwide have diabetes, making it a major cause of death among those under 60. Diabetes is linked to modifiable health behaviors, including obesity, physical activity, lifestyle, and diet. Specific foods like green vegetables, fresh fruits, and dairy are associated with a lower risk of diabetes, while frequent red meat consumption increases the risk. This study aims to use data from the Nutrition and Health Survey in Taiwan (NAHSIT) to identify dietary patterns and their association with diabetes.

METHODS
Using data from the 2017–2020 NAHSIT, we included 3,593 participants aged 19 and older who completed the Food Frequency Questionnaire (FFQ) and diabetes-related survey. Foods were grouped into 21 categories, and Principal Component Analysis (PCA) identified three dietary patterns: the Meat-Vegetable dietary pattern, the Healthy dietary pattern, and the High-Seafood-Low-Soymilk dietary pattern. Multivariable logistic regression was used to examine associations between these patterns and the risks of diabetes and prediabetes, adjusting for sociodemographic factors, with dietary pattern scores categorized into three groups (T1, T2, T3) from lowest to highest.

RESULTS
After adjustment, the Meat-Vegetable dietary pattern was linked to higher risks of diabetes and prediabetes (Diabetes: T2 vs. T1 OR=1.51, T3 vs. T1 OR=2.00; Prediabetes: T2 vs. T1 OR=1.60, T3 vs. T1 OR=2.12). The Healthy dietary pattern showed a protective effect against both conditions (Diabetes: T2 vs. T1 OR=0.70, T3 vs. T1 OR=0.74; Prediabetes: T2 vs. T1 OR=0.96, T3 vs. T1 OR=0.85). The High-Seafood-Low-Soymilk pattern was protective against prediabetes (T2 vs. T1 OR=0.86, T3 vs. T1 OR=0.95).

CONCLUSIONS
This study, using data from the Taiwanese population, found that the Meat-Vegetable dietary pattern—rich in poultry, processed meats, fried foods, and vegetables—was linked to higher risks of diabetes and prediabetes. In contrast, the Healthy dietary pattern, characterized by higher intake of fruits and nuts, showed significant protective effects. Further research is needed to determine the impact of the High-Seafood-Low-Soymilk dietary pattern on diabetes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_157

N-3 PUFA MITIGATES DIABETES-RELATED COGNITIVE DYSFUNCTION BY REGULATING CEREBRAL MITOCHONDRIAL FUNCTION

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BACKGROUND AND OBJECTIVES
Cognitive dysfunction is a common complication of Type 2 Diabetes Mellitus (T2DM). Dietary n-3 polyunsaturated fatty acids (n-3 PUFA) have been shown to enhance cognitive function and to reduce dementia incidence. Investigators explored the effects of n-3 PUFA on central insulin signaling pathways and mitochondrial function under diabetic states.

METHODS
We utilized multiple mouse models of diabetes and cognitive impairment to investigate the impact of impaired glucose metabolism on central insulin signaling pathways and mitochondrial function. Additionally, to address the machines of n-3 PUFA improve diabetes related cognitive dysfunction, we treated db/db mice with n-3 PUFA fortified diets to explore the effects of n-3 PUFA on insulin signaling pathways, mitochondrial function and cognitive function.

RESULTS
db/db mice exhibited pronounced insulin resistance and mitochondrial dysfunction in the brain cortex. Brain mitochondrial energy metabolism abnormality and glutamate-glutamine circulation disorder constitute the pathological basis for diabetes-related cognitive dysfunction. Dietary n-3 PUFA intervention alleviated insulin resistance, neuronal loss, mitochondrial structural abnormalities, energy metabolism disorders, glutamate-glutamine cycling disorders and cognitive dysfunction of db/db mice.

CONCLUSIONS
n-3 PUFA facilitated the recovery of cognitive function in db/db mice by regulating cortical mitochondrial energy metabolism and enhancing the glutamate-glutamine cycle.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_158

TRANSFORMING FOOD ENVIRONMENTS: MANDATORY FOOD REGULATIONS TO SAFEGUARD CHILDREN'S HEALTH AND RIGHTS

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BACKGROUND AND OBJECTIVES
The global rise in ultra-processed food (UPF) consumption is fuelling a health crisis among children, evidenced by escalating obesity, diet-related illnesses, and malnutrition. The food industry's aggressive marketing exacerbates the issue by targeting children with unhealthy options. This brief advocates for mandatory food regulations to protect children's rights, reshape food environments, and combat hunger and malnutrition.

METHODS
A literature review of global research and case studies that evaluate evidence-based policies for transforming food environments was conducted. The compilation of resources was analysed and synthesised into a policy brief.

RESULTS
Mandatory food regulations show transformative impact:
- Chile's Comprehensive Food Law: Reduced calorie, sugar, and sodium intake while limiting unhealthy advertising and fostering healthier food choices.
- Sugar Taxes in Mexico and the UK: Decreased sugary drink consumption, with Mexico reporting a 7.6% decline and the UK halving sugar intake in beverages. In Mexico, revenues supported public health, including school water fountains.
- Front-of-Pack Warning Labels: Empowered consumers to make healthier choices and reduced consumption of high-sugar, high-fat products.
- Marketing Restrictions: Protected children by banning ads, cartoon characters, and toys that promote unhealthy products.
The private sector plays a significant role in public policy-making via Industry lobbying and engagement, which impede the establishment and enforcement of mandatory food regulations.

CONCLUSIONS
Comprehensive food regulations are effective in reducing the appeal and consumption of UPF. Public policymaking needs to be protected from competing interests of the private sector when they infringe on children's rights to healthy diets and food environments. Governments must establish and enforce comprehensive food regulations, including marketing restrictions and industry accountability for ethical marketing, fiscal policies, and food labelling to ensure healthier food environments and safeguard children's health globally.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_160

UNLIKE WATER-SOLUBLE CHOLINE, DIETARY PHOSPHATIDYLCHOLINE, A FAT-SOLUBLE CHOLINE, DOES NOT INCREASE PLASMA TRIMETHYLAMINE-N-OXIDE (TMAO) LEVELS IN RATS

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BACKGROUND AND OBJECTIVES
Choline, betaine, and L-carnitine are transformed into trimethylamine (TMA) by gut microbiota, absorbed into the liver, and oxidized into trimethylamine-*N*-oxide (TMAO) by flavin-containing monooxygenases. Elevated TMAO levels may negatively affect human health. As phosphatidylcholine (PC) is the main source of dietary choline, its intake or PC-rich foods may be harmful to human health; however, quantitative comparative information among dietary choline compounds (fat-soluble choline such as PC and water-soluble choline such as glycerophosphocholine [GPC] and choline chloride [CC]) regarding in vivo generation of TMAO is lacking. In this study, we compared the effects of PC, GPC, and CC on plasma TMAO levels and investigated their effects on gut microbiota at the genus level in rats.

METHODS
Male Sprague-Dawley rats were fed semisynthetic diets that contained 7% soybean oil (control group), 5.5% soybean oil + 2% soybean PC (PC group), 7% soybean oil + 0.6636% GPC (GPC group), or 7% soybean oil + 0.3602% CC (CC group) for 4 weeks. PC, GPC, and CC diets contained equimolar amounts of choline. All experimental diets contained equimolar amounts of fatty acids. After 4 weeks of feeding, the rats were sacrificed, and then obtained samples were analyzed.

RESULTS
There was no difference in food intake, liver weight, weights of mesenteric and abdominal WATs, or soleus muscle weight among the 4 groups. The GPC and CC groups had significantly lower Hepatic phospholipid (PL) contents than the control group. Plasma TMAO levels were significantly higher in the GPC and CC groups than in the control and PC groups. PL-derived choline is absorbed more efficiently in the small intestine than free forms of choline, suggesting that it is difficult to convert PC-derived choline into TMA in the large intestine, and that it does not increase plasma TMAO levels. At the genus level, plasma TMAO levels were significantly correlated with relative abundances of several gut microbes. Among those, the relative abundances of *Anaerotruncus* and *Coprobacter* may have large effects on changes in plasma TMAO levels of rats.

CONCLUSIONS
Our RESULTS clearly indicate that dietary PC, unlike GPC and CC, does not increase plasma TMAO levels in rats. Our data will be valuable as baseline data for the quantitative comparison of dietary choline compounds regarding in vivo TMAO production.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_162

ALLEVIATION EFFECT OF MAFLD BY DIETARY PHOSPHATIDYLINOSITOL: COMPARISON WITH DIETARY MYO-INOSITOL

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BACKGROUND AND OBJECTIVES
Growing evidence indicated that dietary phospholipids (PLs) have beneficial effects on health compared with dietary triglyceride (TG). Our previous studies showed that dietary phosphatidylinositol (PI), one of the minor PL molecular classes, alleviates metabolic dysfunction-associated fatty liver disease (MAFLD) in obese rats. However, it is well known that *myo*-inositol (INO), a constituent base of PI, also has the same effect. Therefore, it remains unclear whether ingestion of PI or INO is more effective. In the present study, we compared the effects of dietary PI and INO on the development of MAFLD in obese and diabetic *db/db* mice.

METHODS
Male *db/db* mice were fed semisynthetic diets that contained 7% soybean oil (TG group), 1% PI-containing diet (PI group), or INO-containing diet which is equal molar INO with PI diet (INO group) for 4 weeks. Also, all experimental diets contained equimolar amounts of fatty acids. After 4 weeks of feeding, the mice were sacrificed and then obtained samples were analyzed.

RESULTS
There was no significant difference in food intake among the 3 groups. The mice of TG group exhibited severe MAFLD. On the other hand, dietary PI and INO significantly alleviated MAFLD. Further analysis demonstrated that dietary PI and INO significantly decreased the activities of fatty acid synthase in the liver of mice, leading to the alleviation of MAFLD. In addition, fecal contents of TG and free fatty acids were significantly higher in the PI group than those in the TG and INO groups. On the other hand, plasma TG concentrations were significantly higher in the INO group than in the TG and PI groups.

CONCLUSIONS
Our RESULTS indicate that the mechanism by which dietary PI alleviates MAFLD (hepatic TG-lowering action) is partially different from that of dietary INO, and further suggest that dietary PI is more effective than dietary INO in terms of exerting an anti-obesity effect in *db/db* mice.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_163

HEALTH IMPACTS OF ANIMAL- AND PLANT-BASED PROTEIN CONSUMPTION IN BELGIUM

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BACKGROUND AND OBJECTIVES
Growing concerns about the environmental and public health impacts of food consumption underscore the importance of evaluating these effects at the national level to inform proactive policies to improve population diets. Previous research has analyzed the environmental impact of protein consumption patterns in Belgium, showing that people who consume a 40/60 ratio of animal/plant-based protein have on average 29% lower diet-related greenhouse gas emissions compared to the average Belgian ratio of around 60/40 (Dénos et al. 2024). Building upon this work, this current study investigates the health impact of Belgian diets, with a specific focus on the ratio between animal and plant protein intake. This research is part of the SUSFOODBEL project, which seeks to identify priority policies to facilitate the transition towards more sustainable diets in Belgium.

METHODS
The Belgian diet was summarised, based on data from the most recent Belgian National Food Consumption Survey (2014-2015). A comparative risk assessment was performed to evaluate the major health outcomes (type 2 diabetes, ischemic heart disease and colorectal cancer) associated with protein consumption. The general framework of the Global Burden of Disease was followed. Population attributable fractions and the attributable burden were calculated for the year 2014 for selected health outcomes. Burden estimates were derived from the Belgian Burden of Disease study.

RESULTS
Preliminary findings suggest that shifts in protein consumption patterns towards more plant-based protein consumption may improve health outcomes such as type 2 diabetes, ischemic heart disease and colorectal cancer. This research will provide quantitative values on the burden attributed to animal and plant protein consumption in Belgium.

CONCLUSIONS
Reducing the environmental and health impacts of animal protein consumption in Belgium requires targeted policies. Promoting plant-based protein as part of a dietary shift could effectively foster both environmental sustainability and public health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_164

HEALTH LITERACY ASSESSMENT OF CAREGIVERS IN HOME ENTERAL NUTRITION

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BACKGROUND AND OBJECTIVES

Health literacy (HL) refers to the ability to seek, understand, evaluate, and use health information and services to make informed decisions. High levels of HL are associated with disease prevention and health promotion. On home enteral nutrition (HEN), HL is essential for properly managing nutritional therapy and patient safety. This study aimed to assess the HL level among caregivers of patients on HEN.

METHODS

This observational, cross-sectional, and descriptive study included caregivers of individuals in HEN, with data collected through home visits between June and September 2024. Sociodemographic and caregiving data were obtained through interviews. HL was assessed using the Eight-Item Health Literacy Assessment Tool (HLAT-8), adapted for the Brazilian population, comprising eight Likert scale questions (0-5) addressing comprehension, information seeking, interactivity, and critical health knowledge. Scores ranged from 0 to 37, with higher scores indicating better HL (Abel et al., 2015). A score of ≥19 (≥50%) was considered satisfactory HL, while scores ≤18 were classified as unsatisfactory HL (Paes et al., 2022). Data were organized and analyzed using descriptive statistics in Excel for Windows®. The study was approved by the Ethics Committee of the Federal University of Paraná (77509924.4.0000.0102).

RESULTS

A total of 34 caregivers were included, 88.2% (n=30) were women, predominantly white (78.1%; n=25), married (50%; n=17), with incomplete middle school education (50%; n=17), and most had a family bond with the HEN patient (97.1%; n=33). HL assessment revealed a mean score of 28 ± 3.23, with all participants achieving satisfactory HL levels. Among the HLAT-8 attributes, understanding health information had the highest score (8.09 ± 2.01), followed by critical health knowledge (7.21 ± 1.49), information seeking (6.56 ± 0.99), and interactivity (6.15 ± 1.48).

CONCLUSIONS

Caregivers demonstrated satisfactory HL levels, with the highest performance in understanding health information. These findings highlight the importance of educational initiatives to enhance HL, particularly in home care.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_165

EVALUATION OF IMPROVED CASSAVA (MANIHOT ESCULENTA CRANTZ) VARIETIES AND ASSOCIATED PRODUCTS FOR PROXIMATE, CYANOGENIC POTENTIAL AND GLYCEMIC INDICES

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BACKGROUND AND OBJECTIVES
The consumption of high-carbohydrate foods has been linked to an increased risk of diabetes mellitus, obesity, cardiovascular diseases, and certain cancers. Research suggests that low-glycemic index (GI) diets are more effective in managing blood glucose levels compared to high-GI foods, which contribute to insulin resistance. This study investigated the proximate, cyanide, and glycemic indices of roots and *eba* (*gari* dough) made from improved cassava cultivars.

METHODS
Twenty cassava cultivars were obtained from the IITA research farms and analyzed for proximate and carbohydrate compositions and cyanogenic potential using standard procedures. Afterward, four cassava varieties were selected using the agglomerate hierarchical cluster analysis. The selected varieties were processed into gari and reconstituted in hot water into *eba,* and the glycemic indices (GIs) of the four *eba* samples were determined in apparently 23 healthy volunteers.

RESULTS
The starch content of the selected varieties was 69.1% for IITA TMEB7419, 71.6% for TMSIBA980505, 72.7% for TMSIBA981089A, and 74.5% for TMSIBA980002. The ratios of starch to sugar were significantly ($p > 0.05$) comparable for all the samples. The GIs obtained for the four *eba* samples were 88.1% for TMSIBA980002; 87.2% for TMS980505; 84.4% for TMEB7419, and 89.1% for TMS IBA961089A.

CONCLUSIONS
This finding proves that the four varieties of *eba* selected for this work are high in glycemic index, implying that a high intake of such foods could benefit individuals involved in sports or energy-intense activities but could pose health risks especially for those with hypertension, obesity, or diabetes mellitus. Slowing absorption and mitigating blood sugar spikes by combining these foods with high-fiber vegetable soups is recommended for individuals with underlying conditions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_166

MG2+ SUPPLEMENTATION PREVENTS HYPERTENSION, ELEVATED LIPID PEROXIDATION, AND INCREASED OSMOTIC FRAGILITY OF ERYTHROCYTES IN PREGNANT DAHL SALT-SENSITIVE (SS) RATS FED A HIGH-SODIUM DIET

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BACKGROUND AND OBJECTIVES
Previous studies have shown that Sprague-Dawley pregnant rats consuming 1.8% NaCl solution during the final week of gestation develop hypertension, increased lipid peroxidation, and enhanced osmotic fragility of erythrocytes compared to those drinking tap water [1]. This salt-loaded pregnant rat model has been proposed as an animal model for preeclampsia [2]. Magnesium sulfate, commonly used to treat preeclampsia with severe features, mitigates the adverse effects of high Na+ intake in these pregnant rats [2]. In this study, we investigated the effect of 3% Mg2+ dietary supplementation (as magnesium gluconate) on Dahl salt-sensitive (SS) pregnant rats, with and without 3% Na+ (as NaCl 8%) in their diet.

METHODS
Blood pressure was measured using the indirect tail-cuff method. Lipid peroxidation was assessed through thiobarbituric acid reactive substances (TBARS) in blood plasma. Erythrocyte osmotic fragility was determined using a previously described method [3].

RESULTS
RESULTS demonstrated that 3% Mg2+ supplementation in the diet of Dahl SS pregnant rats prevented the increase in blood pressure, lipid peroxidation, and erythrocyte osmotic fragility associated with high sodium intake.

CONCLUSIONS
These findings are particularly relevant as Dahl SS rats exhibit a potentially defective Mg metabolism, which has been implicated as a contributing factor to hypertension [4].

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_167

MG2+ SUPPLEMENTATION PREVENTS HYPERTENSION AND HIGH NITRITES AND NITRATES IN KIDNEY HOMOGENATES IN DAHL SS RATS FED A HIGH SODIUM DIET

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BACKGROUND AND OBJECTIVES
Mg2+ deficiency has been related to inducing the Renin-Angiotensin-Aldosterone System (RAAS) in humans and rats (1-3). We have previously shown that magnesemia in Dahl salt-sensitive (SS) rats is ameliorated when treated with Losartan and a defective Mg2+ metabolism in this strain, may be a contributing factor to hypertension (4). In this study, we investigated the effect of 3% Mg2+ dietary supplementation on male Dahl-SS-rats fed a high or normal Na+ diet and treated with or without Losartan.

METHODS
Rats from our inbred colony and from 6-week-old were randomly divided into 8 groups and during the following 6 weeks were treated as follows: 8%NaCl, 8%NaCl-Losartan, 3%Mg2+-8%Na+Cl-, and 3%Mg-8%Na+Cl--Losartan and 4 respective controls. Blood pressure was measured using the indirect tail-cuff method. NO production assessed by its degradation products: nitrites and nitrates, were measured by Griess Reaction in plasma and kidney. Lipid peroxidation was assessed through Malondialdehyde (MDA) Essay in plasma and kidney. Kidney function was measured using creatinine clearance.

RESULTS
Our RESULTS show that Mg2+ supplementation increased plasma nitrites and nitrates and when adding a high Na+-diet this feature remained unchanged, while in kidney were normalized. Mg2+ supplementation did not prevent lipid peroxidation in kidney, while kidney function was unaffected.

CONCLUSIONS
These findings show that Mg2+ supplementation in Dahl-SS-rats fed a high Na+ diet prevents hypertension and high nitrites and nitrates in kidney homogenates. The mechanisms are not well understood, but hormone secretion related to RAAS may be implicated since lipid peroxidation was not prevented in kidney.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_168

DIETARY PATTERNS, NCD DIET QUALITY SCORES AND THE RISK OF DIABETES: A MULTI-COUNTRY STUDY

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BACKGROUND AND OBJECTIVES
Non-communicable diseases (NCDs) such as diabetes, are major global health challenges. Dietary habits play a critical role in NCD risk, with the World Health Organization advocating for nutrient-rich, minimally processed diets. The Diet Quality Questionnaire (DQQ) quantifies diet adequacy and NCD risk using NCD-Protect and NCD-Risk scores. However, their relationships with data-driven dietary patterns remain underexplored. This study evaluated the associations between PCA-derived dietary patterns and NCD-Protect and NCD-Risk scores, and assessed their associations with diabetes indicators

METHODS
Data from 1,859 participants in the SAMPA study across cohorts in India, Zambia, Tanzania, and the Philippines were analyzed. Dietary patterns were derived using principal component analysis (PCA), and NCD scores were computed from food frequency questionnaire (FFQ) data. Adjusted linear regressions evaluated associations with diabetes indicators, while agreements were assessed using kappa statistics

RESULTS
Diverse dietary patterns across cohorts were extracted which seemed healthy, unhealthy or suboptimal. Some degree of correlations was observed between the PCA and diet quality scores. However, there were variable associations between dietary metrics and diabetes indicators. Among Tanzanian adults, suboptimal patterns were associated with increased OGTT glucose, while unhealthy patterns and NCD scores showed no associations. Among Filipino adults, high NCD-Risk scores were associated with increased glucose levels, with no significant HbA1c associations. Other cohorts demonstrated limited or inconsistent associations

CONCLUSIONS
These findings highlight cohort-specific dietary influences on diabetes risk and emphasize the need for diverse dietary metrics. Limitations include the cross-sectional design underscoring the need for longitudinal research to validate these tools

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_169

USING A CONCEPT MAPPING TOOL TO STUDY THE CORPORATE POLITICAL ACTIVITY OF COMMERCIAL ACTORS IN PUBLIC HEALTH

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BACKGROUND AND OBJECTIVES

Non-communicable diseases (NCDs) caused 43 million deaths in 2021 [1], many of which are linked to the influence of commercial actors across various sectors, including tobacco, alcohol, ultra-processed foods, sugary beverages, and fossil fuels [2;3]. Despite the existence of effective public health policies, these industries often hinder their implementation through 'Corporate Political Activity' (CPA). CPA refers to the strategies employed by commercial entities to shape public policy in ways that serve their interests, often at the expense of public health objectives [4].

While CPA strategies used by commercial actors in sectors such as food, alcohol, tobacco, and fossil fuels are well-documented in the scientific literature [4;5], there is limited evidence on which specific CPA strategies are most likely to influence public health policies. These strategies are known for their multi-faceted and systematic nature, reflecting the disproportionate power of corporations in policy spaces and the conflicts of interest that may undermine democratic processes [4]. This study aims to address this gap by using a concept map tool to identify and prioritise the CPA strategies with the most significant impact on public policies in Portugal.

METHODS

A Concept Map Analysis (CMA)-based tool is being developed to help identify and prioritise CPA strategies with the most significant impact on public health policies. The participatory and structured nature of CMA, chosen due to the complexity of the issue [6], aims to foster consensus among public health actors in Portugal, who will be engaged to identify and categorise CPA strategies. The CMA process will begin with brainstorming sessions to familiarise participants with CPA activities, which will then be organised into clusters based on their perceived impact on public health policies. Multivariate statistical techniques, such as multidimensional scaling (MDS) and hierarchical cluster analysis, will be used to assess the relationships between strategies and identify those most likely to influence policy outcomes [7].

RESULTS

The CMA tool is set to be implemented in Portugal in 2025. Concept mapping will identify CPA strategies with the highest likelihood of shaping public policy in Portugal.

CONCLUSIONS

The tool will offer a systematic approach for policymakers and public health advocates to assess CPA activities and their impact on health policy. It will support transparent and democratic policymaking processes while addressing a critical gap in the literature.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_170

THE EFFECTS OF FERMENTED OAT-BASED PRODUCT ON CARDIOVASCULAR DISEASE RISK FACTORS AND PSYCHOLOGICAL DISTRESS: FINDINGS FROM A RANDOMISED CONTROLLED CROSSOVER STUDY

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BACKGROUND AND OBJECTIVES
A healthy diet including nutrient-dense and fibre-rich foods, such as oats, has a positive impact on both cardiovascular and mental health (Pallazola et al. 2019; Firth et al. 2020). Moreover, fermenting plant-based foods may bring additional health benefits through various mechanisms (Wastyk et al. 2021). This study investigated the association between the fermentation of oat-based food consumption, psychological distress, and cardiovascular disease (CVD) risk factors.

METHODS
Fifty-six participants with mild metabolic deterioration (55 ± 8.4 years; BMI 30.4 ± 3.0) completed a 12-week crossover intervention study, during which they ate fermented and non-fermented oat-based products as part of their habitual diet for three weeks each. Metabolic risk factors of CVD (glucose, total cholesterol, LDL-cholesterol, HDL-cholesterol, triglycerides, systolic blood pressure, and waist circumference) were measured before and after the study periods. Psychological distress was assessed with the General Health Questionnaire-12 (GHQ-12). Changes in CVD risk factors and GHQ-12 scores were assessed during the study period, in which participants consumed the fermented product.

RESULTS
HDL-cholesterol levels and waist circumference significantly changed ($p < 0.05$) during the consumption of the fermented product, while no significant changes were observed in GHQ-12 scores.

CONCLUSIONS
Consuming fermented oat-based foods may provide an additional positive effect on cholesterol metabolism but does not appear to influence psychological distress.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_172

LACTOBACILLUS FERMENTUM SUPPLEMENTATION DELAYS AND REDUCES HIGH BLOOD PRESSURE AND NORMALIZE NA+/K+ AND NA+ ATPASE ACTIVITY IN SALT DEPENDENT HYPERTENSION

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BACKGROUND AND OBJECTIVES
Essential arterial hypertension (EHT) comprises 95% of diagnosed cases of hypertension worldwide. Pharmacological therapy is associated with many side effects. Alternative methods such as probiotic bacteria supplementation have been sought. We evaluated the effect of continuous administration of *Lactobacillus fermentum* CVCM 1469, a strain with probiotic potential evaluated *in vitro*, on the development of EHT in the Dahl salt-sensitive (SS) rat model.

METHODS
Six-week-old male Dahl-SS-rats were randomly divided into four groups and during the following 6 weeks they were treated as follow: Dahl-SS-standard-diet, Dahl-SS-8%NaCl, Dahl-SS-8%NaCl-Losartan and Dahl-SS-8%NaCl-Lactobacillus. Losartan was administered by drinking water in a dosage of 10mg/kg/day and *L. fermentum* CVCM 1469 in diet at a dose of 2x107 CFU.
Biological, Clinical-Biochemical, Physiological, parameters and Immunohistochemical analyses were evaluated.

RESULTS
Biological parameters: Intake, urine and fecal excretion were not modified by Lactobacillus supplementation in Dahl-SS-8%NaCl-rats. However, water intake was normalized in this group.
Clinical-Biochemical parameters: Bodyweight was not corrected by *Lactobacillus* supplementation in Dahl-SS-8%NaCl-rats. While hypercalciuria and hyperkaliuria were observed. Increased fractional excretion of Magnesium was reported, however, plasma magnesium remained unchanged.
Physiological parameters: blood pressure values were significantly lower ($p<0.001$) in the Dahl-SS-8%NaCl-Lactobacillus group when compared to the Dahl-SS-8%NaCl and normalization of Na+/K+ and Na+ ATPase activity was observed.
Immunohistochemical analyses showed a reduction in the amounts of pro-inflammatory cytokines in the kidney.

CONCLUSIONS
Daily administration of 2x107 CFU of *L. fermentum* to Dahl-SS-8%NaCl-rats delayed the onset of EHT accompanied by normalization of Na+/K+ and Na+ ATPase activity by, among other mechanisms, modulating renal inflammation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_173

TOTUM-070, a polyphenol-rich combination of plant extracts, reduces LDL cholesterol in individuals with moderate hypercholesterolemia: RESULTS from the randomized, double-blind, placebo-controlled HEART-2 trial

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BACKGROUND AND OBJECTIVES

TOTUM-070 (T070) is a polyphenol-rich substance composed of 5 plant extracts: olive leaves, artichoke leaves, chrysanthellum, goji berries and black pepper. Preliminary *ex vivo* study in humans have shown that the bioactive compounds in this formulation improve lipid metabolism in liver cells. This clinical study aimed to assess the efficacy of TOTUM-070 in reducing plasma LDL-cholesterol (LDL-C) concentration in individuals with moderate hypercholesterolemia.

METHODS

This was a multicenter, randomized, double-blind, placebo-controlled trial. The study included male and female participants aged 18-70 years with moderate hypercholesterolemia (LDL-C between 130 and 190 mg/dL) who were not receiving cholesterol-lowering medication. Participants were randomly assigned to consume a 5-g daily dose of TOTUM-070 or a placebo for 3 months. The primary outcome was the change in fasting blood LDL-C concentration, measured by ultracentrifugation. Secondary outcomes included safety and changes in the lipid profile. Analyses were conducted in the Intention-to-treat (ITT) population. The HEART-2 study is registered at ClinicalTrials.gov (NCT06243484).

RESULTS

A total of 180 participants (mean age: 56.8 ± 9.2 years; BMI: 25.8 ± 3.8 kg.m2; 70.9% women, baseline LDL-C: 1.44 ± 0.19g/L) were included and randomized. TOTUM-070 was well tolerated, with no significant adverse events reported. Fasting blood LDL-C levels were significantly reduced in the TOTUM-070 group compared to the placebo group (Baseline: 1.44 ± 0.18 vs 1.44 ± 0.19 g/L; after 3 months: 1.33 ± 0.17 vs 1.42 ± 0.19 g/L, $p<0.01$). Additionally, compared to placebo, TOTUM-070 consumption resulted in significant reduction in total cholesterol ($p<0.001$), non-HDL-cholesterol ($p<0.001$), triglycerides ($p<0.01$), apolipoproteinB100/ apolipoprotein A1 ratio ($p<0.05$), and apolipoprotein C3 ($p<0.001$).

CONCLUSIONS

In conclusion, this study showed that daily intake of TOTUM-070 significantly lowers LDL-cholesterol and improves other lipid parameters in individuals with moderate hypercholesterolemia. TOTUM-070 may represent a promising non-pharmacological option for the management of early-stage hypercholesterolemia.

CONFLICTS OF INTERESTS

AM: Valbiotis employeeJMB: Valbiotis Scientific board memberMC: Valbiotis employeePS: Valbiotis employeeSLP: Valbiotis CEOVC: Valbiotis employeeVS: Valbiotis employeeYFO: Valbiotis employee

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EPO6_174

OXIDATIVE STRESS AND IMMUNOGLOBULINS IN GESTATIONAL DIABETES

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BACKGROUND AND OBJECTIVES
Gestational diabetes (GD) affects between 8 and 18% of pregnancies worldwide, it is related to obesity and insulin resistance and is associated with oxidative stress and changes in the immune system. With the objective to evaluate the differences in oxidative stress and immunoglobulins between pregnant women with or without GD.

METHODS
A prospective study with pregnant women with and without GD (n=22 per group). After obtaining informed consent, we obtained age and gestational age, dietary data (food frequency), anthropometry (weight and height), and a venous blood sample for laboratory analyses (glucose, Hb1Ac, IgA, IgG, IgM, total cholesterol, triglycerides, catalase, total antioxidant capacity, TBARs and superoxide dismutase). Data were analyzed with Student's t-test or Kruskal-Wallis.

RESULTS
Pregestational BMI and glucose were significantly higher in women with GD ($p<0.01$), as well as glucose and Hb1Ac at GD diagnosis ($p<0.001$). We found TBARS higher in healthy patients ($p<0.05$), SOD higher in GD ($p<0.05$), IgM higher in GD ($p<0.01$).

CONCLUSIONS
Oxidative stress was increased in healthy women, while antioxidants were found increased in GD, contrary to what we expected. With respect to immunoglobulins, not much information is available in the literature, the presence of increased IgM in patients with GD, may be indicating the presence of infection at the time of sampling. Glucose indicators were higher in women who developed GD even before they were pregnant. We observed no differences in lipid profile as well as in dietary intake. Further research is needed to improve treatment and outcomes in pregnant women who develop gestational diabetes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_175

THE IMPACT OF AN ANTI-INFLAMMATORY DIET ON SERUM ATHEROGENIC INDICES AND ANTHROPOMETRIC PARAMETERS IN BREAST CANCER PATIENTS RECEIVING AROMATASE INHIBITORS

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BACKGROUND AND OBJECTIVES
Postmenopausal breast cancer (BC) patients undergoing aromatase inhibitor (AI) therapy often face lipid metabolism changes and altered body composition, increasing their risk of cardiovascular and metabolic complications. An anti-inflammatory diet (AID), rich in whole grains high in fibers, vegetables (e.g., leafy greens, tomatoes), polyphenol-rich fruits (berries), omega-3 sources (fatty fish, nuts, seeds, oils), and low-glycemic index foods, has shown potential for improving metabolic health. This study evaluated the effects of AID on atherogenic indices and anthropometric parameters in postmenopausal BC patients on AI therapy.

METHODS
A 16-week randomized controlled trial was conducted with 30 participants. The experimental group followed a personalized anti-inflammatory dietary protocol, while the control group maintained their usual diet. Lipid profiles, body composition parameters (BMI, waist-to-hip ratio, visceral fat area (VFA), and body fat percentage (BF%) assessed via bioimpedance), and atherogenic indices including the atherogenic index of plasma (AIP), atherogenic coefficient (AC), and Castelli Risk Index (CRI) I & II were measured at baseline and post-intervention. Based on an initial nutritional status assessment, a conservative caloric restriction (CR) of 500–1000 kcal/day was included in the personalized intervention when appropriate.

RESULTS
At baseline, 55% of the diet-intervention group were overweight or obese. This group demonstrated significant reductions in CRI I & II and AIP ($p \leq 0.05$). Anthropometric measures revealed significant decreases in BMI, waist circumference, VFA ($p \leq 0.05$), and BF% ($p \leq 0.01$), with no significant change in skeletal muscle mass. These improvements were significantly greater compared to the control group. Weight loss of 5% to 10% of initial body weight was achieved through CR tailored to the patients' age and initial BMI.

CONCLUSIONS
An anti-inflammatory diet may help manage lipid abnormalities and improve body composition in postmenopausal BC patients on AI therapy. Larger studies are needed to validate these promising pilot findings.
This study was supported by the Science Fund of the Republic of Serbia (Grant PRISMA No.5050, Project title: Anti-Inflammatory Dietary Intervention in breast cancer patients receiving aromatase inhibitors - AID) ClinicalTrials.govr: NCT06214598.

CONFLICTS OF INTERESTS
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EPO6_176

OPTIMIZING OMEGA-3 FATTY ACIDS, DIETARY FIBER, AND MICRONUTRIENT INTAKE IN BREAST CANCER PATIENTS ON AROMATASE INHIBITOR THERAPY BY AN ANTI-INFLAMMATORY DIET

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BACKGROUND AND OBJECTIVES

Breast cancer patients on aromatase inhibitor (AI) therapy frequently encounter nutritional and metabolic challenges. A pro-inflammatory diet, linked to obesity, consists of refined carbs, saturated fats, and low fruit and vegetable intake. In contrast, the anti-inflammatory diet (AID) emphasizes omega-3 fatty acids, complex carbs, lean proteins, polyphenols, and fiber. This study aimed to assess changes in omega-3, fiber, and micronutrient intake in postmenopausal breast cancer (BC) patients undergoing AI therapy with an AID protocol.

METHODS

Thirty participants were enrolled in a 16-week intervention. The intervention group followed an AID, while the control group maintained their usual diet. Dietary intake was assessed using three 24-hour recalls and a food frequency questionnaire. The total antioxidant capacity (Total-ORAC) value was used to assess the antioxidant capacity of diets.

RESULTS

The AID group showed significantly higher intake of omega-3 fatty acids (including alpha-linolenic acid, EPA, and DHA) and dietary fiber ($p<0.05$). The diet also significantly increased the intake of several key vitamins and minerals. Vitamin D, which supports bone health and immune function, was primarily derived from fortified foods and oily fish, which are often limited during AI therapy. Vitamin E, an antioxidant, comes from nuts and seeds, while vitamin A was sourced from vegetables. The intake of vitamin C, essential for collagen synthesis and immune defense, was increased through citrus fruits and berries. Additionally, the intake of vitamins B6 and B12, critical for energy metabolism and neurological health, also showed significant improvements ($p<0.05$). Mineral intake also showed positive changes such as magnesium (from nuts, seeds, and leafy greens), and selenium (from fish and whole grains). Additionally, patients significantly reduced their sodium intake ($p < 0.05$), contributing to better dietary balance. The overall dietary total-ORAC increased, highlighting the enhanced nutritional quality achieved through the anti-inflammatory diet.

CONCLUSIONS

Together, these micronutrient improvements strengthened the diet's anti-inflammatory and immune-supportive properties. This dietary approach offers substantial benefits for BC patients undergoing AI therapy, helping mitigate treatment-related side effects and promoting overall health.

This study was supported by the Science Fund of the Republic of Serbia (Grant PRISMA No.5050, Project title: Anti-Inflammatory Dietary intervention in breast cancer patients receiving aromatase inhibitors - AID) ClinicalTrials.gov: NCT06214598.

CONFLICTS OF INTERESTS

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EPO6_177

PLASMA TNF-A AND ADIPOCYTOKINES LEVELS IN APOE/LDLR-/- MICE FED FERMENTED FOOD PRODUCTS AS A VITAMIN K DIETARY SOURCES

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BACKGROUND AND OBJECTIVES
Vitamin K (VK) comprises a group of similarly structured, fat-soluble substances which exists in nature in the form of VK1 and VK2. Vitamins K has shown potential for the prevention and treatment of various diseases (cardiovascular, bone health, cancer). VK exert a range of activities that extend far beyond coagulation and include anti-inflammatory effects, it can reduce oxidative stress and inflammation. Main nutritional sources of VK1 are green, leafy vegetables, whereas sources of VK2 are fermented food, e.g. natto-fermented soybean, dairy (e.g. cheese), meat and eggs. The main objective of the research was to verify the hypothesis about the effectiveness of dietary vitamin VK2 as an anti-inflammatory agent, in the prevention of atherosclerosis in ApoE/LDLR-/- mice. Therefore the aim of the study was to analyze the level of inflammatory markers (e.g. TNF-alpha) and adipocytokines (adiponectin, resistin) in mice plasma.

METHODS
Two month-old mice were fed for the 8 weeks AIN-93G modified diets containing vitamin K-rich products: natto, cheese, sauerkraut and synthetic vitamin K2 MK-7 (100 µg/kg b.w./day). Blood was collected from the left ventricle of heart into tubes and centrifuged at 14,000×g for 4 minutes to isolate plasma. Measurements of inflammatory marker (TNF-α) and adipocytokins (adiponectin and resistin) were done by immunoenzymatic method by ELISA test using commercially available kits (Bio-Techne, R&D Systems, Inc. Minneapolis, MN, USA).

RESULTS
Plasma TNF-α level was significantly increased ($p<0.05$) in mice fed cheese (4.72 pg/ml) compared to other experimental groups (e.g. control 2.30 pg/ml). Whereas, concentration of adiponectin was significantly decreased ($p<0.05$) in cheese group (9.54 µg/ml) compared to control (16.40 µg/ml). Adiponectin level was also significantly decreased ($p<0.05$) in mice fed natto (12.76 µg/ml) in comparison to control. However, no significant changes in the concentrations of resistin were observed after feeding mice experimental diets. Additionally, body weight of mice was unchanged.

CONCLUSIONS
In conclusion, high concentrations of TNF-α inhibit the secretion of adiponectin from adipocytes (probably by reducing adiponectin gene expression) in plasma of mice fed diet with cheese. It is known that high levels of TNF-α were shown in cardiovascular diseases. Whereas, adiponectin has anti-atherogenic and anti-inflammatory effects.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_178

EFFECT OF AN INTERVENTION WITH NUTRITIONALLY ENHANCED BAKERY PRODUCTS ON CHRONIC LOW-GRADE INFLAMMATION IN CHILDREN WITH OVERWEIGHT OR OBESITY. MEDKIDS STUDY

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BACKGROUND AND OBJECTIVES

Chronic low-grade inflammation (CLGI), characterized by increased serum inflammatory markers such as C-reactive protein (CRP), IL-6 and TNFα, has been associated with the development of several non-communicable diseases. Mediterranean diet (MD), renowned for its anti-inflammatory properties, is regarded as a strategy for managing CLGI. Dietary fiber -an essential component of MD– has been suggested to reduce serum inflammatory markers, while simple sugars and saturated fatty acids have been linked to higher concentrations. This study aimed to evaluate the effect of an intervention based on nutritionally enhanced bakery products, with higher fiber content and other nutritional improvements, compared to conventional products, on CLGI in children with overweight and obesity.

METHODS

Randomized controlled crossover study, with two 8-week intervention periods separated by a 5-week washout. Participants, 6-12 years old children with overweight or obesity, followed an MD-based intervention and were randomly assigned to consume conventional bakery products (control) or enhanced products (intervention): one type of bread and two bakery items with a 39-49% increase in dietary fiber, and reductions in saturated fat (43-73%) and sugar (39-200%). Blood samples were collected at baseline and post-intervention to assess changes in inflammatory markers concentrations in both groups. To assess the combined effect of all inflammatory markers, an index was calculated by subtracting the sum of z-scores of the anti-inflammatory markers (IL-10,IL-4 and ghrelin) from the sum of z-scores of the proinflammatory markers (CRP, white blood cell count, leptin, IFNγ, TNFα, IL-1β, IL-6).

RESULTS

20 participants (age 11.2±1.6 years) met the inclusion criteria, having values for all inflammatory markers in the four measurements and having excluded those with acute inflammatory processes (leukocytosis or CRP > 10 mg/L). After adjusting for covariates (baseline inflammatory status, age, sex and zBMI), a significant interaction between the intervention and sequence was observed ($F=4.6$, $p=0.049$). The inflammation index decreased by −0.506 in the intervention group compared to the control group from baseline to the end of the study. No significant differences were observed in any of the inflammatory markers when analyzed individually.

CONCLUSIONS

Nutritionally improved bakery products intake, compared to conventional ones, may have an effect on CLGI in children with overweight/obesity.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_179

SOURCE-SPECIFIC DIETARY NITRATE AND NITRITE INTAKE AND INCIDENCE OF COLORECTAL CANCER IN THE DANISH DIET, CANCER, AND HEALTH COHORT

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BACKGROUND AND OBJECTIVES

Nitrate and nitrite, found in a variety of foods and drinking water, may be associated with colorectal cancer (CRC) via the formation of carcinogenic N-nitroso compounds (NOCs). The aim of this study was to examine source-specific associations and identify subpopulations at higher risk.

METHODS

Data was obtained from the Danish Diet, Cancer, and Health cohort, including over 54,610 participants with no history of cancer at baseline. Participants reported their usual diet in an FFQ, and nitrate/nitrite intakes were calculated using comprehensive food composition databases and data from national monitoring programmes on drinking water quality. During 27 years of follow-up, 2245 cases of CRC (of which 1508 colon and 737 rectal) were identified through national health registries. Cox proportional hazards models, adjusted for sociodemographic, diet and lifestyle factors, were used to estimate associations between source-specific nitrate/nitrite intakes and incidence of CRC as sub-types. Analyses were stratified by sex and factors hypothesized to promote (smoking and high consumption of red meat) and inhibit (high consumption of vitamin C, vitamin E, folate, and polyphenols) the formation of NOCs.

RESULTS

No associations were observed between intakes of nitrate/nitrite from dietary sources and incidence of CRC [HR [95% CI)]: plant sources: 0.97 (0.84, 1.12), naturally-occuring animal sources: 0.97 (0.84, 1.12), additive-permitted meat sources: 1.05 (0.90, 1.21), or drinking water: 1.07 (0.91, 1.24). We observed no clear pattern in the HRs when stratifying by factors hypothesized to influence the formation of NOCs. While no associations were found for tap water-sourced nitrate intake, a significantly higher rate of colon cancer was observed among participants supplied by wells with a nitrate concentration ≥ 9.25 mg/L [1.52 (1.11, 2.07)]. The association was similar across all models of adjustment. In the stratified analysis, evidence of the association was observed among former or current smokers [1.77 (1.24, 2.44)], and in participants with a low intake of folates [1.67 (1.03, 2.70)], and flavonoids [1.85 (1.16, 2.95)], and a high intake of red meat [1.58 (0.97, 2.57)].

CONCLUSIONS

Nitrate/nitrite intake from animal sources and plant sources were not associated with incidence of CRC in the cohort. A nitrate concentration in tap water ≥9.25 mg/L was associated with a higher incidence of colon cancer among subpopulations hypothesized to be at increased risk of NOCs formation.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_181

EFFECTS OF A POLYPHENOL-RICH PROPRIETARY BLEND OF FREEZE-DRIED FRUITS AND VEGETABLES ON SERUM PROTEOME, COGNITIVE FUNCTION, AND HEALTH IN OLDER ADULTS AT RISK OF COGNITIVE AND FUNCTIONAL DECLINE

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BACKGROUND AND OBJECTIVES
The Mediterranean diet (MD) is associated with cardiovascular and cognitive health benefits. However, it is challenging for Western populations to replicate the recommended blend and quantity of fruits and vegetables. Polyphenols a key bioactive found in MD with antioxidant and anti-inflammatory properties, may also influence extracellular vesicle (EV) dynamics. DailyColors™, a polyphenol-rich formulation inspired by the MD, incorporates extracts from 16 fruits, vegetables, and herbs. This study aimed to evaluate the cognitive and physiological effects of 60 days of supplementation with DailyColors™ in overweight older adults.

METHODS
A total of 150 UK adults aged 50 years and older with a BMI ≥ 25 were recruited for a randomised, double-blind, placebo-controlled study conducted to evaluate cognitive and physical fitness via the PROTECT-UK online platform. Participants were randomly assigned to receive either a medium dose (750 mg, ~300 mg polyphenols), a high dose (2000 mg, ~750 mg polyphenols) of DailyColors™, or a placebo for 60 days. Additionally, a subset of 45 participants (n=15 per group) underwent further assessments, including blood pressure monitoring, phenolic metabolite analysis, evaluation of circulating EVs, and tandem-mass-tagged serum proteomics in blood.

RESULTS
Sixty days of DailyColors™ supplementation improved cognitive function, with significant improvements in attentional reaction time and accuracy in the intervention groups. Enhanced physical fitness was observed in the Timed Stand Test in the high-dose group and in the Chair Stand Test across all groups. Proteomic analysis showed that both medium and high doses of DailyColors™ decreased protein expression in pathways associated with inflammation and immunity, vesicle-mediated transport. Expression of proteins known to inhibit high-density lipoprotein (HDL) assembly was also diminished. No such effects were observed in the placebo group. No significant effects were observed on the size and concentration of total EVs or specific EV populations (CD31+, CD41+, CD45+, or CD31+CD45-).

CONCLUSIONS
DailyColors™ supplementation may improve cognitive function, physical fitness, and overall health in older, overweight individuals, possibly replicating the anti-inflammatory benefits of the MD. These RESULTS should be further explored via larger-scale studies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_182

FLAVORS OF HEALTH: COMMUNITY-BASED NUTRITION EDUCATION FOR CHRONIC DISEASE PREVENTION

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BACKGROUND AND OBJECTIVES
Throughout the world, high rates of chronic disease can be attributed in part to poor diet and physical inactivity, both of which can be mitigated through behavior change.Flavors of Health (FoH) is a dynamic, community nutrition and health education program within the State of Louisiana. FoH utilizes evidence-based information and practices to empower both youth and adults to make healthy food and fitness choices, to help prevent or manage chronic disease and improve quality of life.

METHODS
FoH consists of a group of nutrition extension agents and specialists across the state who develop and conduct presentations and community workshops on a variety of food, nutrition, and lifestyle topics. Agents engage with their communities through a variety of methods, to build consumer's knowledge and skills in areas of label reading/food selection, food preparation and cooking, creating healthy home food environments, exercise/physical activity, healthy habit development strategies, weight management, and diet-disease issues and trends. FoH has also developed multi-session educational initiatives to help prevent or manage diabetes, hypertension, overweight/obesity, and chronic diseases in general. FoH typically evaluates these initiatives among small samples of adult participants, through a pre/post intensive survey design, analyzed using Wilcoxon signed-rank test; and a 3-month follow-up survey to assess on-going behaviors/use of information. Participant comments after each learning event are also collected.

RESULTS
FoH teaches and motivates participants to make healthier choices: "*I learned to create healthy, lifestyle goals that are specific, do-able and sustainable*"; "*…this workshop has inspired me to cook more!*" Program survey participants (n=26 to 49) reported ($p<0.05$): increased consumption of fruits, vegetables, whole grains; reduced consumption of saturated fats and sodium; increased frequency of label reading to make healthier food choices; increased time being physically active; decreased time spent sitting; increased confidence in various [healthy] food-related activities. Most respondents (up to 98%) maintained their behavior changes through follow-up.

CONCLUSIONS
The FoH program affects healthy eating and physical activity behaviors among adult participants and appears to support maintenance of these behaviors. The FoH approach to community nutrition education supports chronic disease risk reduction.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_183

"A TASTE OF HERBS AND SPICES": A COMMUNITY-BASED FOOD AND NUTRITION EDUCATION INITIATIVE TO ADD FLAVOR, REDUCE SODIUM, AND IMPROVE HEALTH

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BACKGROUND AND OBJECTIVES

High sodium intake is among dietary risk factors that largely impact chronic disease (CD) and early death, while *taste* is a primary driver of food choice and eating behavior. Diet strategies to improve public health include a focus on knowledge, confidence and skills associated with adoption of lower salt food preparation. “A Taste of Herbs and Spices” (Taste) is a Louisiana-based nutrition education initiative, promoting an array of herbs and spices, in lieu of salt, to develop flavorful, culturally appropriate dishes/meals. The objective of Taste is to encourage lower sodium cooking and meal preparation, ultimately, to improve diet quality and health.

METHODS

Taste highlights a different herb/spice each month. A one-page, two-sided colorful newsletter-style template has been developed to provide a consistent format for information describing the herb/spice, its nutritional benefits, how to use it, and how to grow it. Importantly, a recipe and an herb/spice sample, sufficient to prepare the recipe, is also included. This document also provides links to AgCenter nutrition education/CD prevention curricula available to community members. And each document contains a QR code linking to a [voluntary], 4-item program evaluation survey. All information is reviewed by field specialists. The document is printed; the seasoning sample is attached. Each month LSU AgCenter nutrition agents distribute the informational handout to libraries, community centers, and/or other local organizations, for community access. Some agents also conduct food/recipe demonstrations at these sites.

RESULTS

The Taste program just began its third year. Materials have been picked up by approximately 2,000 people each month, across 23 of Louisiana’s parishes. The year 1 survey focused on familiarity of this and other AgCenter nutrition education/CD prevention programs. Of those responding (n=106), 90% did not know about the nutrition educational opportunities, and 96% reported that they plan to find out more about them. The year 2 survey focused on behavior change. Of those reporting (n=85), 74% tried a new herb/spice because of this program, and 100% will/will possibly use the herb/spice in place of salt, in food preparation.

CONCLUSIONS

A Taste of Herbs and Spices successfully fosters flavorful, lower sodium cooking to improve diet quality.Taste materials help publicize more substantial nutrition education/CD prevention programs. Directly and indirectly, Taste supports better health within the community.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_184

DEFICIENCY IN WDR6 REGULATES LIPID METABOLISM AND SUPPRESSES FAT ACCUMULATION IN OB/OB MICE

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BACKGROUND AND OBJECTIVES

WD repeat protein 6 (WDR6) is characterized by a WD repeat sequence with motifs of approximately 40–60 amino acids repeated four or more times. Previous studies showed that the knockdown of WDR6 reduced lipid accumulation in 3T3-L1 cells; however, its role in systemic fat accumulation remains poorly understood. This study explored the effects of systemic WDR6 deficiency on obesity-related phenotypes in Lep*ob/ob* mice, providing new insights into the molecular mechanisms underlying obesity.

METHODS

Wdr6+/+Lep*ob/ob* and Wdr6−/−Lep*ob/ob* mouse groups were generated by crossing Lep*ob/+* mice with Wdr6+/− mice, both on a C57BL/6J genetic background. Mice were maintained under ad libitum feeding and drinking conditions until 16 weeks of age. Bodyweight, food intake, water consumption, and fat volume were measured. Plasma, liver, and adipose tissue samples were collected from each group for the analysis of lipid metabolism-related gene and protein expression using qPCR and western blotting(WB).

RESULTS

The body weights of Wdr6−/−Lep*ob/ob* mice were significantly lower than those of Wdr6+/+Lep*ob/ob* mice. Computed tomography (CT) imaging demonstrated a substantial reduction in subcutaneous and visceral fat volumes in the Wdr6−/−Lep*ob/ob* group compared with the Wdr6+/+Lep*ob/ob* group. Additionally, plasma aspartate aminotransferase (AST) levels were significantly lower, and adiponectin levels were significantly higher in the Wdr6-/-Lep*ob/ob* group. mRNA expression analysis by qPCR showed an upregulation of genes associated with β-oxidation in Wdr6−/−Lep*ob/ob* mice. Furthermore, protein analysis revealed increased p-AMPK levels and suppressed ACC levels. These RESULTS suggest that WDR6 deficiency activates the AMPK-ACC pathway, promoting lipid metabolism and reducing fat accumulation.

CONCLUSIONS

This study demonstrated that WDR6 inhibition in Lep*ob/ob* mice activated the AMPK-ACC pathway and promoted β-oxidation, leading to reduced body weight. These findings suggest that WDR6 is a novel regulator of lipid metabolism and may be a potential therapeutic target for metabolic disorders.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_186

GREEN-ALGAE EXTRACT AS A NOVEL FUNCTIONAL FOOD COMBATING OBESITY BY IMPROVING LIPID PROFILE AND PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR-GAMMA COACTIVATOR 1-ALPHA LEVELS

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BACKGROUND AND OBJECTIVES
Obesity is associated with cardiovascular disease, metabolic disorders, and accelerated aging. Both obesity and aging manifest in decreased peroxisome proliferator-activated receptor-γ coactivator α (PGC-1α) levels. *Caulerpa racemosa* (sea grapes), a green alga abundant in shallow temperate and tropical seas around the world, is harvested intensively as a source of macro and micronutrients, and is important in the Southeast Asian traditional diet. Integrating compound profiling via metabolomics, followed by in silico, in vitro tests and a clinical trial, this study aims to improve our understanding of the pharmacological activity of *C. racemosa* ethanol extract (CRE) demonstrated in our previous preclinical trial (In Vivo study).

METHODS
Six major CRE constituents identified by metabolomic profiling were evaluated using an in silico approach against human pancreatic lipase, a-glucosidase, and a-amylase to predict prospective anti-obesity candidates. A 4-week randomized, double blind, placebo-controlled clinical trial was conducted to evaluate the effect of CRE on the lipid profile and PGC-1α levels in obese men. Participants were randomly assigned CRE (*n*=35) or placebo (*n*=35) at a dose 1.68 g/70kg BW/day. The trial received ethical approval from Prof. Dr. R. D. Kandou General Hospital with No. 142/EC/KEPK-KANDOU/VIII/2021 and was registered with ClinicalTrials.gov NCT05037591.

RESULTS
In vitro, CRE showed 45.66±0.55% antioxidant activity by DPPH assay. The lipase inhibitory activity of CRE reached 90.30±0.40%, 1.75% lower than orlistat. The a-amylase inhibitory activity of CRE was 84.07±5.28%, while its inhibitory activity against a-glucosidase was 81.67±1.54%, both lower than acarbose. The CRE group showed a significant ($p<0.05$) decrease in blood glucose, total cholesterol, low-density lipoprotein (LDL), triglycerides (TG), waist circumference, BMI, and WHR ($p <0.05$), while PGC-1α and high-density lipoprotein (HDL) increased significantly ($p =0.0001$) compared with the placebo group.

CONCLUSIONS
Our study revealed that green algae *C. racemosa* extract or CRE is a potent anti-obesity agent or functional food that produces no significant adverse effects.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_187

UNLOCKING THE THERAPEUTIC POTENTIAL OF EDIBLE BIRD NEST: IN SILICO, IN VITRO, AND IN VIVO EVIDENCE AGAINST METABOLIC SYNDROME ON OBESE RATS

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BACKGROUND AND OBJECTIVES
This study aims to reveal the existence of an edible bird nest (EBN) as a functional food candidate that may be a new alternative in fighting metabolic syndrome.

METHODS
The study included three approaches: in silico molecular docking simulation, in vitro, and in vivo in rats fed on cholesterol- and fat-enriched diets (CFED) as obesity model. Four terpenoids of Bakuchiol, Curculigosaponin A, Dehydrolindestrenolide, and 1-methyl-3-(1-methyl-ethyl)-benzene in EBN have been identified through LCMS/MS-QTOF. Forty male Rats (*Rattus norvegicus*) rats weighing 204.03 ± 3.68 g were used in the in vivo investigation. The rats came from the Animal Model Farm in Yogyakarta, Indonesia, and were acclimated for 10 days in a controlled environment (27 °C, 50–60% relative humidity, balanced light–dark cycle), with access to regular animal feed and water from PT Citra Ina Feedmill.

RESULTS
In molecular docking simulations, Bakuchiol and Dehydrolindestrenolide are considered very potent because they have higher inhibitory power on the four receptors (iNOS, ROS1 kinase, FTO, and lipase) than standard drugs. In vitro tests also provide insight into the antioxidant, antidiabetic, and antiobesity activities of EBN, which is quite feasible due to the smaller EC50 value of EBN compared to standard drugs. Interestingly, in vivo studies also showed significant improvements ($p<0.05$) in the lipid profile, blood glucose, enzymatic levels, and inflammatory biomarkers in rats given high-dose dietary supplementation of EBN. More interestingly, high-dose dietary supplementation of EBN upregulates PGC-1α and downregulates HMG-CoA reductase. In addition, CFED rats supplemented with both doses of EBN had significant improvements in inflammatory biomarkers, including peroxisome proliferator-activated receptor-γ coactivator 1-α Levels PGC-1α, TNF-α), IL-10, and superoxide dismutase (SOD) serum levels.

CONCLUSIONS
Comprehensively, it has been revealed that EBN can be novel functional foods for combating metabolic syndrome.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_188

DELITES™ SUPPLEMENTATION MITIGATES METABOLIC SYNDROME AND MODULATION GUT MICROBIOME IN MALE SPRAGUE DAWLEY RATS FED ON CHOLESTEROL- AND FAT-ENRICHED DIET: A RANDOMIZED PRECLINICAL TRIAL STUDY

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BACKGROUND AND OBJECTIVES
Metabolic syndrome (MetS) is a global health concern, characterized by a combination of dyslipidemia, insulin resistance, obesity, and hypertension, significantly increasing the risk of type 2 diabetes mellitus (T2DM) and cardiovascular diseases. Gut microbiota plays a pivotal role in MetS pathophysiology, with dysbiosis exacerbating metabolic impairments. Delites™, a supplement inspired by Traditional Chinese Medicine, has shown potential in modulating gut microbiota and mitigating MetS.

METHODS
A randomized preclinical trial was conducted on 32 rats divided into four groups: control-normal, CFED, CFED+low-dose Delites™ (54 mg/kg), and CFED+high-dose Delites™ (108 mg/kg). Parameters including lipid profiles, enzymatic activity, molecular biomarkers, and gut microbiota composition were analyzed.

RESULTS
Delites™ significantly improved lipid profiles, reduced inflammation (TNF-α), enhanced anti-inflammatory markers (IL-10), and increased energy metabolism regulator PGC-1α. Gut microbiota modulation showed increased beneficial genera (*Bifidobacterium*, *Lactobacillus*) and reduced pathogenic *Proteus*, improving microbial diversity.

CONCLUSIONS
Delites™ supplementation effectively mitigates MetS through metabolic and microbiota modulation. These findings highlight its potential for precision medicine approaches to combat metabolic disorders. Further research is needed to explore its long-term effects and translational relevance in humans.

CONFLICTS OF INTERESTS
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. However, author Juan Leonardo is affiliated with the Company of Delites™ (PT. Citra Deli Kreasitama) and received funding support for this research. However, the authors and contributors also declare that this is not an endorsement of the product that is the subject of this study Delites™; all claims in this article are in accordance with the study/research conducted. The funder had no role in the design, data collection, data analysis, and reporting of this study.

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THE EFFICACY OF NOVEL SEAWEED SULFATED POLYSACCHARIDES IN ALLEVIATING CARDIOMETABOLIC SYNDROME VIA PRMT1/DDAH/ADMA AND GUT MICROBIOTA MODULATION IN OBESITY MODELS

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BACKGROUND AND OBJECTIVES
Our investigation intended to analyze the effects of sulfated polysaccharides from *Caulerpa racemosa* (SPCr) in attenuating obesity-induced cardiometabolic syndrome via regulating the protein PRMT1-DDAH-ADMA with the mTOR-SIRT1-AMPK pathways and gut microbiota modulation.

METHODS
A total of forty rats were randomly divided into four treatment groups: Group A received a standard diet; Group B was provided with a diet enriched in cholesterol and fat (CFED); and Groups C and D were given the CFED along with ad libitum water, and daily oral supplementation of 65 or 130mg/kg of body weight (BW) of SPCr, respectively. This study approved by the Ethics Committee with a registration number of 039/EC/KEPK-KANDOU/IV/2023, and received approval from the ethics board of the International Register of Preclinical Trial Animal Studies Protocols (preclinicaltrials.eu) under the registration number PCTE0000370.

RESULTS
Group D showed the lowest low-density lipoprotein, triglyceride, total cholesterol, and blood glucose levels, and the highest HDL level compared to the other groups in this study. These RESULTS in the group fed high-dose SPCr demonstrated a significant effect compared to the group fed low-dose SPCr ($p < 0.0001$), as well as in total cholesterol and blood glucose ($p < 0.05$). Supplementation with SPCr was also observed to have an upregulation effect on peroxisome proliferator-activated receptor gamma coactivator (PGC)-1alpha, interleukin 10, Sirtuin 1, DDAH-II, superoxide dismutase (SOD) cardio, and AMPK, which was also followed by a downregulation of PRMT-1, TNF-α, 3-hydroxy-3-methylglutaryl coenzyme A reductase inhibitor, and mTOR. Interestingly, gut microbiota modulation was also observed; feeding the rats with a cholesterol-enriched diet shifted the gut microbiota composition toward the Firmicutes level, lowered the Bacteroidetes level, and increased the Firmicutes level.

CONCLUSIONS
A dose of 130 mg/kg BW of SPCr is the recommended dose, and investigation still needs to be continued in clinical trials with humans to see its efficacy at an advanced level.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_191

PROBIOTIC LACTOBACILLUS SP. AS A VIABLE STRATEGY FOR MODULATION OF NON-COMORBID OBESITY: A METHODICAL META-ANALYSIS AND GRADE ASSESSMENT OF RANDOMIZED CONTROLLED TRIALS

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BACKGROUND AND OBJECTIVES
The World Health Organization (WHO) reports that over 650 million people are affected by obesity. A prominent contemporary approach to treating obesity involves altering the gut microbiota. Substantial evidence indicates that Lactobacillus sp. may beneficially impact body weight and fat accumulation. The aim of this study is to evaluate the efficacy and safety of probiotic supplementation with *Lactobacillus sp.* in individuals who are overweight or obese.

METHODS
The Preferred Reporting Items for Systematic Review and Meta-analysis, commonly known as PRISMA, were adhered to in this research. Searches were conducted in the following medical databases up to November 28, 2024: PubMed, Wiley, ScienceDirect, and Cochrane. Revised Tool for Risk of Bias in Randomized Trials (RoB 2.0) was used to evaluate the potential for bias, and Review Manager 5.4 was employed for the meta-analysis.

RESULTS
A total of 1,058 participants was included across 12 studies. Eight studies presented a low risk of bias, and four presented a medium risk of bias. Significant reductions were observed in body mass index (BMI; MD:-0.40 kg/m2; 95%CI: -0.48 to -0.32, $p<0.00001$), weight (MD:-1.16 kg; 95%CI: -1.79 to -0.53, $p=0.0003$), waist circumference (MD:-1.41 cm; 95%CI: -1.75 to -1.08, $p<0.00001$), and hip circumference (MD:-0.85 cm; 95%CI: -1.09 to -0.61, $p<0.00001$).

CONCLUSIONS
Supplementation *with Lactobacillus sp.* probiotics to address gut dysbiosis demonstrates potential in inducing reductions in body mass index, body weight, adipose tissue content, waist and hip circumferences, visceral and subcutaneous adiposity, and leptin levels, while concurrently elevating adiponectin concentrations, with an observed absence of discernible adverse effects.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_192

EMPLOYING MULTI-OMICS, PHARMACOINFORMATICS, AND IN VITRO APPROACHES TO DISCOVER THERAPEUTIC BIOMOLECULES IN OYSTER MUSHROOM

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BACKGROUND AND OBJECTIVES
Oyster mushroom (*Pleurotus ostreatus*) is recognized as a functional food due to its bioactive compounds with therapeutic potential, particularly in managing metabolic disorders. This study aims to explore the bioactive profile of oyster mushroom flour (OMF) using a multi-omics approach to evaluate its antioxidant, antiobesity, and antidiabetic properties.

METHODS
A comprehensive multi-omics approach was employed, integrating metabolomics and proteomics profiling using LC-HRMS and Orbitrap mass spectrometry. In vitro assays assessed antioxidant capacity through ABTS and superoxide dismutase (SOD) activity, antiobesity potential via lipase inhibition and 3T3-L1 adipocyte assays, and antidiabetic effects via α-glucosidase, α-amylase, and dipeptidyl peptidase-4 (DPP-4) inhibition tests. *In silico* pharmacoinformatics analysis further mapped molecular interactions and pathways.

RESULTS
Metabolomic profiling identified 376 unique compounds and 13 peptides, including antioxidants and enzyme inhibitors, contributing to antiobesity and antidiabetic effects. In vitro assays demonstrated that OMF exhibited significant radical scavenging activity with ABTS inhibition (EC_{50}: 119.80 mg/mL) and SOD activity (EC_{50}: 101.75 mg/mL). The lipase inhibition assay revealed an IC_{50} value of 104.10 mg/mL, indicating a potential antiobesity effect. Additionally, OMF showed significant α-glucosidase inhibition (EC_{50}: 101.90 mg/mL), α-amylase inhibition (EC_{50}: 96.18 mg/mL), and DPP-4 inhibition (EC_{50}: 130.59 mg/mL), with statistical significance ($p < 0.05$). *In silico* pharmacoinformatics analysis mapped bioactive compounds to metabolic pathways, revealing enrichment in oxidative stress response and glucose metabolism pathways. Notably, the KEGG pathway analysis identified significant involvement in "Metabolic pathways" (Fold Enrichment: 500, FDR < 0.05) and "Biosynthesis of secondary metabolites" (Fold Enrichment: 500, FDR: 3.83e-68). Network pharmacology studies indicated interactions of bioactive compounds with key molecular targets such as PPAR-γ, GLUT4, and AMPK, which are crucial in regulating glucose uptake and lipid metabolism. These RESULTS confirm the potential of OMF in metabolic disorder management.

CONCLUSIONS
These findings validate *P. ostreatus* as a natural resource for managing metabolic disorders and developing evidence-based functional foods. The study bridges the gap between compound discovery and therapeutic application, paving the way for broader utilization in nutraceuticals and precision nutrition strategies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_193

INFLAMMATORY POTENTIAL OF THE DIET IN KIDNEY TRANSPLANT RECIPIENTS: ASSOCIATION WITH SARCOPENIA AND ITS COMPONENTS

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BACKGROUND AND OBJECTIVES
Sarcopenia, a progressive and generalized disorder of the skeletal muscle associated with adverse outcomes, is highly prevalent in kidney transplant recipients (KTR). The etiology of sarcopenia is multifactorial, and inflammation is one of its underlying mechanisms. Recently, evidence has emerged that dietary intake is capable of modulating systemic inflammation. The dietary inflammatory index (DII) is a widely used tool to assesses the inflammatory potential of the diet. Previous studies have shown a negative association between the DII and sarcopenia in the general population; however, to our knowledge, no study has investigated this association in KTR. The present study aimed to evaluate the association between DII and sarcopenia and its components (muscle mass, muscle strength, muscle quality, and physical performance) in KTR.

METHODS
This cross-sectional study included 170 adult KTR (59% men) aged 50 (42-57) years. Appendicular lean soft tissue (ALST) was evaluated using dual-energy X-ray absorptiometry, muscle strength by handgrip strength (HGS), muscle quality by muscle quality index (MQI), and physical performance by gait speed (GS). Sarcopenia was defined according to the European Working Group on Sarcopenia in Older People 2 (EWGSOP2) and sarcopenic obesity according to the European Society for Clinical Nutrition and Metabolism (ESPEN) and the European Association for the Study of Obesity (EASO). Energy adjusted DII (E-DII) was estimated based on 3 24-h recalls as proposed by Shivappa et al. (2014) and stratified as anti-inflammatory (E-DII<0) and pro-inflammatory (E-DII>0).

RESULTS
The E-DII ranged from -2.89 to 4.78. KTR with E-DII>0 (n=94), compared to those with E-DII<0 (n=76), exhibited lower values of GS (1.02 ± 0.18 vs. 1.09 ± 0.21; p=0.03). E-DII was negatively correlated with MQI (r = -0.23; p = 0.006) even after adjustment for confounders (r = -0.28; p = 0.001) and tended to be negatively correlated with HGS (r = -0.16; p = 0.06) and GS (r = -0.16; p = 0.05). In the adjusted regression analysis, higher E-DII values were associated with higher odds of poor MQI (1.37 (1.02-1.84); p = 0.04) and presented a tendency toward higher odds of low HGS (1.30 (0.97-1.75); p = 0.08). Indices of ALST (ALST/height, /weight, and /BMI) and the diagnosis of sarcopenia and sarcopenic obesity were not associated with the E-DII.

CONCLUSIONS
The present study suggests that in KTR a pro-inflammatory diet is associated with poor muscle quality and worse physical performance.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_195

ADDRESSING DYSLIPIDEMIA IN MADHYA PRADESH, INDIA: A CALL FOR TARGETED LIPID-LOWERING INTERVENTIONS

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BACKGROUND AND OBJECTIVES

The rising burden of atherosclerotic cardiovascular disease (ASCVD) in India is driven by risk factors such as hypertension, diabetes, obesity, and tobacco use, with dyslipidemia contributing significantly to this risk. However, population-based data on lipid profiles stratified by ASCVD risk are limited, particularly in low epidemiological transition states like Madhya Pradesh. This study aimed to quantify the burden of dyslipidemia and assess the need for lipid-lowering therapy as a strategy for primary and secondary prevention of ASCVD in Madhya Pradesh.

METHODS

We conducted a secondary analysis of a cross-sectional, population-based STEPS survey in Madhya Pradesh, India, covering 4,552 adults. Lipid parameters (total cholesterol, LDL-C, HDL-C, triglycerides) were assessed using point-of-care testing. ASCVD risk was categorized following the Lipid Association of India 2020 guidelines, and treatable dyslipidemia was defined using updated therapeutic thresholds.

RESULTS

Among 4,552 participants, we found that 32.73% of study population is at a low ASCVD-risk, and 36.42% and 30.84% are at moderate and high/ very high risk for CVD. The proportion of individuals in each of these risk-categories who need lipid-lowering therapy in these low, moderate and high risk categories is 1.5%, 8.7% and 38.1% respectively for LDL-C treatable dyslipidemia, and 1.1%, 5.2%, and 25.1% respectively for Non-HDL-C treatable dyslipidemia. Thus, a total of 19.3% of adults in the state of Madhya Pradesh need statin therapy.

CONCLUSIONS

This study highlights the considerable burden of dyslipidemia and the associated need for lipid-lowering therapy in the population of Madhya Pradesh, especially in individuals with moderate to high ASCVD risk. With nearly one-fifth of the population requiring statin therapy, there is an urgent need to enhance screening and treatment efforts to manage dyslipidemia effectively. The findings emphasize the importance of a risk-based approach to cardiovascular disease prevention, particularly in populations with elevated risk factors such as hypertension, obesity, and diabetes. Implemention of guideline-directed interventions, including statin use and lifestyle modifications, are needed for the mitigation of the progression of cardiovascular diseases in this population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_196

NON-CANCER EFFECT OF NITRATE AND NITRITE ON HUMAN HEALTH FROM DRINKING WATER IN THE AUTONOMOUS PROVINCE OF VOJVODINA

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BACKGROUND AND OBJECTIVES
In 2023, 45% of the Autonomous Province of Vojvodina (APV) population, especially in municipalities without appropriate drinking water treatment, used non-purified but disinfected drinking water (NPDW), which was safe in about 18% of samples. Among elevated concentrations of organic matter, ammonia, iron, and manganese and inadequate sensory characteristics, the recognized hazards were nitrate and nitrite. This work aims to assess the non-cancer effect of nitrate and nitrite on the APV population's human health

METHODS
The analyses are based on the RESULTS for 11.919 NPDW samples from the APV originating from seven authorized and accredited public health institutions. Drinking water safety was assessed according to national laws, in which the proposed level for nitrate is 50 mg/l and nitrite 0.03 mg/l. The non-cancer risk was characterized by the chronic hazard index (HHI) using the United States Environment Protection Agency methodology, separately for adults and children, ingestion and dermal absorption, and average and maximum nitrate and nitrite concentrations.

RESULTS
The average and maximum nitrate concentrations in NPDW were 5.23 mg/l and 139 mg/l, respectively. Regarding nitrite, the average concentration was 0.04 mg/l, while the maximum was 1.01 mg/l. The highest nitrate and nitrite concentrations in NPDW were found in the south and south-west of APV. After one year of ingestion and dermal absorption, HHI for average nitrate concentration among adults and children under five is acceptable (8.46E-02; 4.36E-01, respectively), while the maximum nitrate concentration with HHI 2.25E+00 for adults and 1.16E+01 for children under five represent a nonacceptable hazard. Although are the average and maximum nitrite concentrations in NPDW above the proposed values, HHI for nitrite does not represent a human health hazard (<1) nor for adults (5.97E-04 for average and 1.63E-02 for maximum concentration), nor children under five (3.08E-03 for average and 8.38E-02 for maximum concentration).

CONCLUSIONS
The concentration of nitrate and nitrite in NPDW in APV poses critical health concerns, so action is urgently needed to provide safe drinking water to every citizen of APV. The local governments responsible for water supply must be encouraged to take immediate and effective action to address this pressing issue.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_198

EFFECTS OF SEMAGLUTIDE 2.4 MG ON HEALTHCARE COSTS IN PATIENTS WITH OBESITY AND HEART FAILURE

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BACKGROUND AND OBJECTIVES
Obesity is increasingly recognized as a significant public health challenge and economic burden in the United States. Multiple studies have established obesity as a major risk factor for the development of heart failure (HF). Similarly, HF also imposes a significant economic burden on healthcare systems. Semaglutide 2.4 mg, which has shown improvements in HF-related symptoms, physical limitations, along with noticeable weight loss in the STEP-HFpEF phase 3 clinical trial, may reduce healthcare costs in the real world. This study assessed the change in medical costs in the year pre vs. post initiation of treatment with semaglutide 2.4 mg among patients with overweight or obesity (Ov/Ob) and HF.

METHODS
Patients with Ov/Ob and HF initiating semaglutide 2.4 mg after June 15th 2021 with ≥12 months of continuous insurance enrollment before (baseline period) and after (follow-up period) the index date (first semaglutide 2.4 mg fill date) were identified from a large nationally representative claims database. Absolute and relative changes in inpatient, outpatient, emergency room (ER), and total medical costs were assessed in the follow-up period vs. baseline period using a paired t-test.

RESULTS
A total of 806 eligible patients with Ov/Ob and HF treated with semaglutide 2.4 mg were identified; more than half were female (59.7%) with a mean age of 54 years and BMI of 36.9 kg/m2 . The mean total costs per patient per year (PPPY) were $29,654 in the baseline period, compared to $22,152 in the follow-up period, resulting in a reduction in total medical costs by $7,502 (25.3%; p=0.003). Mean inpatient, outpatient, and ER costs PPPY were $13,481, $13,975, and $2,197 in the baseline period compared to $9,110, $11,341, and $1,701 in the follow-up period, resulting in a reduction in costs by $4,372 (32.4%; p=0.04), $2,634 (18.84%; p=0.005), and $496 (22.58%; p=0.003), respectively.

CONCLUSIONS
Semaglutide 2.4 mg was associated with a significant decrease in annual medical costs among patients with Ov/Ob and HF.

CONFLICTS OF INTERESTS
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EPO6_199

NON COMMUNICABLE DISEASE PROFILE OF A RURAL COMMUNITY IN KWAZULU-NATAL IN SOUTH AFRICA

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BACKGROUND AND OBJECTIVES
According to Indigo Wellness report released by the World Health Organization (WHO) South Africa has the unhealthiest people in the world out of the status of 151 countries. The score was brought down by the following criteria of the population: inactivity (0), hypertension (0.2), obesity (0.2) and diabetes risk (0.2) together with low life expectancy (0). This reflects the unhealthy reality as set out by the WHO that 28.3% of adults are obese, with an increased risk of non-communicable diseases like hypertension and diabetes. The increased consumption of highly refined and processed foods together with the decreased consumption of nutrient- and fibre-dense fruits, vegetables, legumes and grains in communities attribute to increased risk of non-communicable diseases.

METHODS
Participants were conveniently sampled with door-to-door visits from trained fieldworkers within the Umzinyathi District – one of the rural areas of the KwaZulu-Natal province. Non-communicable diseaases diagnosis, like diabetes Mellitus, hypertension and cholesterol dia was self-reported after known medical diagnosis of participant. Dietary intake was taken by 24-hour recall administered by fieldworkers.

RESULTS
The study sample (N=150) were predominantly female (83%) with 125 females completing the 24 hour food recall questionnaire compared to 25 male adults. Self-reported non-communicable diseases included a profile of 29.3% (n = 24) already diagnosed with Diabetes Mellitus (DM) of the total sample. 66.7% of the self-reported adults have been diagnosed with DM type 1 and 33.3% with DM type 2 while being on treatment. With 50% (n=48) diagnosed with hypertension on treatment and 21% (n=17) with high cholesterol levels.

CONCLUSIONS
Higher mortality rates of black Africans, especially in rural areas, are attributed to complications of DM and other non-communicable diseases such as cerebrovascular disease and hypertensive heart disease, which is in line with the self-reported information of hypertension, DM and high cholesterol given by the study sample. The lack of dietary diversity combined with high intake of refined starches and sugar likely contribute to the mortality and morbidity in this rural community. Further interventions can be addressed by local clinics and improving dietary intake. This can assist with the 2030 nutrition goals to reduce the risk of non-communicable diseases such as hypertension and DM in rural areas to improve the South African health status of adults.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

1. Diabetes Atlas: https://diabetesatlas.org
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EPO6_203

CAN DIETITIANS LEAD THE WAY FOR ORAL HEALTH PROMOTION IN THE EATING DISORDER CLINICAL SETTING?

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BACKGROUND AND OBJECTIVES
Individuals with an eating disorder (ED) are five times more likely to have poor oral health, regardless of ED subtype. Research involving individuals who have experienced a mental illness like an ED, have documented barriers such as shame or fear of judgment as deterrents from seeking dental care. The role of non-dental health professionals providing pre-emptive oral health promotion (OHP) has been gaining traction in recent years. However, there is limited research investigating the perceptions and acceptability of individuals with an ED towards oral health and the potential role of dietitians in this area. Hence, the aim of this study is to explore the role of dietitians in OHP within ED clinical settings. Specifically, the objectives are to synthesise current evidence on the role of ED clinical dietitians and OHP; explore the perceptions of individuals with a lived experience of an ED regarding their experience of oral health and; to explore the knowledge, attitudes and practices of dietitians in general, and in ED clinical settings about OHP.

METHODS
A sequential mixed methods study was undertaken across four phases involving a scoping review, quantitative and qualitative studies. Participants included Dietitians and individuals with a lived experience of an ED.

RESULTS
The findings from the literature review showed some dietitians were already using OHP in their practice and this was further supported by recommendations from prominent dietetic organisations that supported the role of dietitians providing oral health promotion. A significant gap identified in both the scoping review, national survey and interviews with dietitians showed a dearth in training and professional resources to support the role of OHP in dietetic practice. Importantly, dietitians felt that OHP was part of their role. Qualitative interviews with individuals with a lived experience of an ED detailed the impacts of poor oral health on their self-esteem, and recovery. Both individuals with an ED and dietitians were receptive to the concept of a dietitian led oral health promotion program.

CONCLUSIONS
The findings show support from both dietitians and individuals with a lived experience of an ED towards optimising the role of dietitians in the ED clinical setting to include OHP. Further research is required to develop and pilot test a basic screening tool and resources to support dietetic practice in OHP. Further, clear guidelines need to be developed to assist and encourage dietitians in incorporating OHP into their practice.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_209

IDENTIFICATION OF NATURAL BIOACTIVE COMPOUNDS AS POTENTIAL INHIBITORS OF ADIPOGENESIS: AN IN SILICO ANALYSIS

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BACKGROUND AND OBJECTIVES

The prevalence of obesity has become a significant global health concern, driven by sedentary lifestyles and unhealthy dietary patterns (1). This condition is closely linked to the accumulation of adipose tissue through a process known as adipogenesis, which involves the differentiation of preadipocytes into mature adipocytes (2). Natural bioactive compounds have gained increasing attention due to their potential to inhibit adipogenesis and offer safe alternatives for obesity management (3). Computational approaches, particularly ligand-based methods, provide valuable techniques for identifying and predicting the bioactivity of compounds with known anti-adipogenic effects reported in literature (4). By targeting key molecular pathways involved in this process, our objective is to offer insights into their therapeutic potential and lay the groundwork for future experimental validation and anti-obesity strategies.

METHODS

Ligand-based virtual screening calculations have been employed using the MetaScreener tool (https://github.com/bio-hpc/metascreener) to select molecules as bioactive compounds with adipogenesis inhibition activity. Next, the top 100 compounds were chosen for additional visual analysis. Finally, we carried out a consensus. This procedure allowed the identification of 60 compounds simultaneously present in all computational techniques, which indicates their high potential as inhibitors of adipogenesis.

RESULTS

From all 60 potential molecules, our RESULTS showed that those derived from plant sources demonstrated promising activity in inhibiting adipogenesis. This activity is similar to that reported in the literature for well-known bioactive compounds, which are recognized for their ability to modulate adipocyte differentiation . These findings suggest that the compounds under investigation may also possess potential anti-adipogenic effects.

CONCLUSIONS

In silico studies offer a systematic approach to identify new bioactive compounds with potential anti-adipogenic activity. Our computational research has highlighted compounds with notable in silico potential to inhibit adipogenesis by targeting key molecular pathways involved in adipocyte differentiation. These compounds are currently being further explored for their efficacy in obesity management through in vitro analysis.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_210

VALIDITY OF BODY MASS INDEX AND GLYCATED HEMOGLOBIN FOR EVALUATING METABOLIC SYNDROME

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BACKGROUND AND OBJECTIVES
Metabolic syndrome is currently considered a public health problem that has had an exponential increase secondary to nutritional habits and physical activity of the population at a global level, which requires a continuous re-evaluation of the parameters used for diagnosis and treatment. Although body mass index (BMI) and glycated hemoglobin are commonly used, they have significant limitations. This study aims to identify the most cost-effective parameters for clinical application, optimizing patient treatment, outcomes, and prevention.

METHODS
A literature review was conducted in various databases to evaluate the parameters used for diagnosis and monitoring of metabolic syndrome, focusing on the limitations of BMI and glycated hemoglobin.

RESULTS
BMI has notable limitations for assessing obesity, as it does not allow differentiation between muscle mass and body fat, being more useful as a population-level marker rather than as a precise tool for individualized patient assessment. The cost-effective alternatives identified include abdominal circumference, lipid profile, C-reactive protein, fibrinogen, inflammatory cytokines and indices such as lipid accumulation product and cardiometabolic index, being highly sensitive and specific. (1)
With the introduction of Continuous Glucose Monitoring (CGM), glycated hemoglobin has been discontinued for glycemic control, especially in insulin-dependent diabetes. Although CGM is promising, it has limitations and should be complemented with glycated hemoglobin for optimal control. (2)

CONCLUSIONS
BMI and glycated hemoglobin, when used in isolation, require re-evaluation as diagnostic tools for metabolic syndrome. This study proposes to incorporate parameters and innovative technologies that impact early diagnosis and in turn the prognosis of patients.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_212

IMPACT OF A 3-WEEK HYPOCALORIC DIET AND EXERCISE ON BODY WEIGHT AND LIPID PROFILES IN OBESE CHILDREN

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BACKGROUND AND OBJECTIVES
Children's obesity is a significant public health issue affecting millions of children worldwide. It is characterized by excessive body fat that negatively impacts children's health and well-being. The main goal of this study was to assess the effect of a hypocaloric diet combined with physical activity on body weight, body mass index (BMI), and lipid profiles in obese children.

METHODS
Thirty-six hospitalized obese children (17 boys and 19 girls) aged 12-18 years underwent a 3-week hypocaloric diet with proper nutritional value (1200-1500 kcal/day) and practiced individual aerobic physical activities at least 3 hours/day. Serum lipids (total cholesterol (TC), high-density lipoprotein (HDL)-cholesterol and triglycerides (TGs)) were measured using standard enzymatic methods, while low-density lipoprotein (LDL)-cholesterol was determined using the Friedwald equation. The obtained RESULTS were used to calculate two parameters: risk for cardiovascular diseases (RFCVD; TC—HDL-cholesterol) and index of atherosclerosis (IA; LDL-cholesterol—HDL-cholesterol).

RESULTS
After three weeks of diet and exercise, body weight and BMI significantly decreased (8.6% and 10.7%; $p<0.001$, respectively) in obese children. All lipid parameters (TC, LDL and TGs) significantly reduced, $p<0.001$, except HDL-cholesterol with no significant changes ($p=0.05$). A significant reduction was also found for RFCVD and IA (24.2% and 36.8%; $p<0.001$, respectively).

CONCLUSIONS
This study highlights the positive impact of a hypocaloric diet combined with aerobic physical activity on body weight, BMI, and lipid profiles in obese children. The significant reductions in cardiovascular risk factors underscore the effectiveness of this intervention in improving the overall health and well-being of obese children. These findings emphasize the importance of structured dietary and exercise programs in early prevention and management strategies to combat childhood obesity and its associated health risks.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_213

ASSOCIATION BETWEEN INTERLEUKIN8-251 POLYMORPHISM, HELICOBACTER PYLORI INFECTION, AND DIETARY VITAMIN C INTAKE WITH THE RISK OF GASTRIC PRECANCEROUS LESIONS

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BACKGROUND AND OBJECTIVES
This study aimed to investigate the effects of interleukin 8-251 (IL8-251) polymorphism, *Helicobacter pylori* (*H. pylori*) infection, and dietary vitamin C intake on gastric precancerous lesions, atrophic gastritis (AG) and intestinal metaplasia (IM), and to evaluate the interaction effects of IL8-251 genotypes according to the presence of *H. pylori* infection or dietary vitamin C intake.

METHODS
This cross-sectional study used data from a baseline survey of the Yangpyeong cohort for cancer research. Overall, 331 voluntary participants (135 normal, 80 AG, and 116 IM) who underwent upper gastrointestinal endoscopy and agreed to participate in the genomic analysis and dietary habit survey were included. A food frequency questionnaire was used to obtain the dietary vitamin C intake and *H. pylori* infection was diagnosed using the campylobacter-like organism test.

RESULTS
IL8-251 polymorphisms and *H. pylori* infection were independently associated with the risk of AG and/or IM. *H. pylori*-positive was associated with the risk of IM in participants with IL8-251 AT type (odds ratio [OR] = 4.85; 95% confidence interval [95% CI] = 1.96–11.99) and AA type (OR = 8.51; 95% CI = 2.31–31.31), compared to TT type with *H. pylori*-negative. Low vitamin C intake was associated with the risk of IM in the IL8-251 AT type (OR = 3.29; 95% CI = 1.43–7.60) and AA type (OR = 5.82; 95% CI = 1.59–21.27) compared to the IL8-251 TT type with a high vitamin C intake.

CONCLUSIONS
IL8-251 genotype was the important risk factor of AG and IM, and *H. pylori*-positive and low vitamin C intake were associated with the risk of AG or IM in IL8-251 AA or AT genotype.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_214

THE EFFECT OF PERSONALIZATION OF A COMBINED LIFESTYLE INTERVENTION ON HABITUAL FOOD CONSUMPTION EVALUATED WITH THE EETSCORETM

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BACKGROUND AND OBJECTIVES
Combined Lifestyle Interventions (CLI) are programs used for people with chronic lifestyle related diseases focusing on improving food intake, physical activity, sleep and/or stress coping skills. The reimbursed Dutch CLI SLIMMER was enriched with personalisation factors that resulted in additional weight loss and improved retention. The aim of the current study was to examine the effect of the six-months personalized SLIMMER-CLI on habitual food consumption.

METHODS
In this cluster-allocated open-label study, 54 persons (age 49.8±11.8 yrs; BMI 33.6±4.6 kg.m-2) participated in the personalized SLIMMER-CLI (intervention) and 24 persons (age 47.3±11.1 yrs; BMI 34.6±5.0 kg.m-2) participated in the regular SLIMMER-CLI (control). Personalization, i.e. the adaptation of the combined lifestyle intervention to personal needs and preferences, included shared decision making, continuous monitoring and feedback, goal setting, and adaptation of the advice based on a person's biology and behaviour. Adherence to the Dutch dietary guidelines was assessed with the Dutch Healthy Eating Index at baseline and at six months using data from the online EetScoreTM questionnaire (doi: 10.1017/S0007114521004499).

RESULTS
The per protocol analysis showed that both groups changed their habitual food intake after six months SLIMMER-CLI. Main effects indicated that adherence to the Dutch dietary guidelines significantly increased for vegetables, whole grain products, unhealthy food choices, salt intake, sugar-sweetened beverages and processed meat for both groups, resulting in an increase in the total Dutch Healthy Diet Index Score at month 6. Within group statistics showed that adherence to the Dutch dietary guidelines with respect to salt intake improved more in the personalized SLIMMER-CLI as compared to regular SLIMMER-CLI. Within the personalized SLIMMER-CLI only, adherence scores for whole-grain product consumption and fats and oils correlated with waist circumference and waist-hip ratio.

CONCLUSIONS
Adherence to the Dutch dietary guidelines improved after six months of SLIMMER-CLI in both groups. For whole-grain product and fats and oils adherence also correlations with waist circumference and waist-hip ratio were found.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_217

AMARANTH PROTEIN ISOLATE (AMARANTHUS CRUENTUS L.) PROMOTES A NORMOLIPIDEMIC EFFECT IN A DIET RICH IN SATURATED FAT AND MODULATES THE ACTIVITY OF THE ENZYME HMG-COA REDUCTASE

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BACKGROUND AND OBJECTIVES
Hypercholesterolemia and the resultant cardiovascular diseases represent the primary causes of mortality worldwide. Some foods, including amaranth, have been shown to reduce the risk of these diseases developing. The objective of this study was to determine the effect of amaranth proteins on cholesterol homeostasis in hamsters fed a diet high in saturated fat. The study also examined the impact of amaranth proteins on the expression of mRNA related to cholesterol metabolism, fatty acids profile, and the activity of the enzyme HMG-CoA reductase in the liver of the hamsters.

METHODS
The hamsters were divided into three groups (n = 8/group): Group N (AIN93, 20% casein), Group H (cholesterol and saturated fat, 20% casein), and Group I (cholesterol and saturated fat, 20% amaranth protein). The hamsters were fed for 21 days. At the conclusion of the experimental protocol, the animals were anesthetized and a comprehensive set of biological samples was collected for analysis. These samples included blood and liver tissue. Total cholesterol, fractions, and triacylglycerols were analyzed in the plasma. Liver analysis encompassed total lipids, total cholesterol, fatty acid profile, and the expression levels of the genes Srebf2, Ldlr, Abca1, Abcg1, Abcg5, Abcg8, Lxrα, Ampk, and the activity and expression of the enzyme HMGCoA-reductase.

RESULTS
The RESULTS obtained from this study are as follows: As anticipated, the H diet resulted in elevated cholesterol levels; however, the amaranth protein isolate effectively maintained total cholesterol, triacylglycerol, and fraction concentrations, comparable to the N group. A comparative analysis revealed a lower deposition of lipids and total liver cholesterol in groups N and I compared to group H, thereby indicating the protective effect of amaranth. Furthermore, groups N and I exhibited higher levels of polyunsaturated fatty acids and a greater polyunsaturated/saturated ratio. While the relative expression of the analyzed genes remained consistent across groups, group I exhibited a reduced activity of the HMG-CoA reductase enzyme in comparison to group H.

CONCLUSIONS
These findings suggest that amaranth protein can impede an escalation in the levels of both circulating and hepatic lipids, even in the context of concurrent consumption of a diet with a high degree of saturation. This effect appears to be, at least in part, attributable to a decrease in the activity of the HMG-CoA reductase enzyme.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_219

ASSESSING HIDDEN TRANS FAT SOURCES IN REFINED VEGETABLE OILS: A MULTI-COUNTRY ANALYSIS TO INFORM GLOBAL TFA POLICY IMPLEMENTATION

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BACKGROUND AND OBJECTIVES
World Health Organization (WHO) has been working toward the global elimination of industrially produced *trans* fat (iTFA) through the REPLACE initiative since 2018. The initiative has successfully introduced mandatory, best practice regulations in more than 45 countries since 2018. WHO recommends one of two policy options: 1) limit iTFA to 2% of total fat in all fats, oils and foods, or 2) ban the production and use of partially hydrogenated oils (PHO). The application of high temperatures during the deodorization stage of oil refining can lead to the conversion of unsaturated fatty acids to TFA. Typically, the *trans*isomers created through this process range from 0.5-2% percent of total fat. However, evidence from Bangladesh(1) and China(2) has shown that some vegetable oils exceed the WHO recommended limit, and have a higher than expected *trans* fat content, likely due to prolonged exposure to high temperatures. This unexpected source of TFA could mean that the impact of TFA intake on heart disease is underestimated; that relying on PHO bans may have limited efficacy, and that TFA surveillance activities may overlook important TFA sources. Resolve to Save Lives in collaboration with the Instituto Nacional de Saúde Doutor Ricardo Jorge (INSA) and collaborators in low and middle-income countries, is conducting a multi-country assessment to determine the prevalence of high TFA in refined vegetable oils. The study aims to 1) measure the levels of iTFA in commonly used cooking oils in study countries, 2) compare the prevalence of iTFA in commonly used cooking oils across study countries, and 3) establish whether price or type of oil influences iTFA content in cooking oils.

METHODS
Our study will map the available vegetable oils from vendors in 8 countries. In each country, up to 20 oils will be collected, key nutrient and label information will be recorded. Oils will be analyzed using gas chromatography with flame ionization detection at INSA's lab. Data will be collected and analyzed between January and June 2025

RESULTS
Samples from 8 countries will be analyzed according to the WHO Laboratory Protocol on Measuring TFA and reporting as a percentage of TFA of the total fatty acids in oils. RESULTS will be compared across oil types and countries.

CONCLUSIONS
This study will reveal important information about sources of *trans* fat in the diets of many low and middle-income countries and potentially lead to significant changes in plans for TFA policy adoption and implementation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_223

FOLATE METABOLISM AND BREAST CANCER RISK IN THE EPIC-SPAIN COHORT: A NUTRIGENETICS PERSPECTIVE

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BACKGROUND AND OBJECTIVES

Breast cancer (BC) is the neoplasm with the highest incidence, prevalence and mortality in women worldwide. Folate metabolism participates in nucleotide biosynthesis and regulation of DNA expression. Multiple of enzymes and a wide range of vitamins participate in this path, such as folate, vitamins B2, B6, and B12. The aim of this study is to assess the impact of single nucleotide polymorphisms (SNPs), and nutrients related to folate metabolism on breast cancer risk within the EPIC-Spain cohort.

METHODS

A case-control study nested in the European Prospective Investigation into Cancer and Nutrition (EPIC)-Spain cohort was conducted with 269 incident BC cases in women and 472 non-cases. EPIC was the source of demographic, clinical and dietary information. Genetic data were obtained from wide genotyping through Infinium Global Screening Array (Illumina®) and utter imputation. SNPs selection was done according to 1) GWAS Catalog evidence; 2) Minor allele frequency; 3) Linkage disequilibrium. Association between genetic and nutritional variables with BC risk was performed using $\chi 2$ tests and logistic regression, individually and using risk scores.

RESULTS

Median age was 48.3 and 51.2 years in cases and controls, respectively. Menopause status, tobacco consumption and oral contraceptives consumption were associated with a higher risk of BC risk. Among a total of 18 SNPs in 14 genes selected, RESULTS suggested that *MTHFS* rs4778734, in the recessive model, might be associated with a higher risk of developing BC (OR = 1.30; 95%CI = 1.10-1.59; p = 0.009) after multiple comparison adjustment. Otherwise, neither the other SNPs or the assessed nutrients (folate, B2, B6, B12, and alcohol) nor the risk scores showed a significant association with BC risk.

CONCLUSIONS

Our findings suggest that genetic variants in genes related to folate metabolism may influence BC development. However, this association was not conclusive when analyzing the nutrients involved. This may be partly due to implicit errors in the estimation of the intake of these nutrients, as well as their bioavailability, lack of repeated measurements, etc. Further larger studies including nutritional biomarkers are needed to confirm these RESULTS.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_224

CALORIC AND FAT INTAKE AMONG STATIN USERS IN SERBIA

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BACKGROUND AND OBJECTIVES

Cardiovascular diseases (CVDs) remain the leading cause of death worldwide, significantly contributing to increased disability and healthcare costs. Serbia is no exception, with CVDs accounting for 47% of all deaths, making them the leading cause of mortality in the country. Dietary risks rank second in the global burden of CVDs attributable to selected modifiable risk factors. Adherence to dietary recommendations plays a crucial role in the prevention of CVDs, both before and alongside pharmacological interventions. This study evaluated the quality of diet, specifically regarding fat intake, among statin users.

METHODS

Data on demographic, clinical, and lifestyle factors were collected, using a series of interviewer and self-completion questionnaires. Data on total caloric intake, total fat intake, saturated fat intake, and dietary cholesterol intake were calculated using 24-hour dietary recalls for three non-consecutive days. The average daily intake for each subject was calculated as the mean of the three 24-hour dietary recalls.

RESULTS

In total, 70 participants on chronic atorvastatin therapy (20 mg) [age: 63.3 ± 7.8 yrs; 25 female, 55 male; BMI: 27.1 ± 3.5 kg/m2] completed all questionnaires and were included in the analysis. Of these participants, 77% were eligible for secondary prevention of cardiovascular events, and 51% reported a positive family history of CVDs. Patients with diabetes represented 23% of the study population. The average daily energy intake with 24-h dietary recall was 1768 ± 490 kcal/day. The RESULTS indicated that the intake of total fats (39%), saturated fats (14%), and cholesterol (221 mg) exceeded the recommended dietary values.

CONCLUSIONS

These findings suggest suboptimal dietary behaviors among patients on chronic statin therapy. Public health initiatives and dietary monitoring are needed to enhance the understanding of the impact of diet on health within this population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO6_225

MULTICOMPONENT NUTRITIONAL APPROACH PROTOCOL AND ASSESSMENT OF ITS IMPACT ON THE HEALTH OF BRAZILIAN WOMEN WITH OBESITY

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BACKGROUND AND OBJECTIVES
Obesity is a complex issue influenced by political, relational, behavioral, social, and health factors. The overload of social roles and responsibilities of women, social stigma, and aesthetic pressure exacerbate the condition, making more humanized and comprehensive approaches necessary. The objective was to develop a protocol for a multicomponent nutritional approach and assess its impact on the health of Brazilian women with obesity.

METHODS
A comprehensive literature review on multicomponent nutritional interventions, official documents on obesity and communication techniques was conducted by an interdisciplinary team. The developed protocol was applied in a randomized clinical trial over 6 months and included 89 adult women with obesity, randomly assigned to the following groups: control group (G1), individual multicomponent approach (G2), and individual multicomponent approach combined with group meetings (G3). The study was approved by the Ethics Committee of the research institution. Participants in G1 followed a diet with a 500 to 1000 kcal/day deficit aimed at weight loss. G2 participated in an average of 10 individual sessions based on the developed protocol, while G3 combined this approach with group meetings focused on social support and experience sharing. Assessments were conducted at the beginning and end of the intervention and included anthropometric measurements, body composition using DXA, biochemical analyses, and the use of scales to assess stress, anxiety, and depression. Statistical analyses were conducted using SPSS.

RESULTS
The protocol integrated political, relational, environmental, behavioral, and health dimensions, using tools for each dimension, culminating in special attention to mental health, movement/physical activity, spirituality, sleep, and nutrition. All groups showed reductions in waist circumference and fasting blood glucose, a decrease in body fat percentage, and an increase in lean mass. G1 did not show significant changes in anxiety, while G2 and G3 exhibited significant reductions. G2 also showed a decrease in depression symptoms.

CONCLUSIONS
The multicomponent approach was effective in psychoemotional aspects. All groups showed improvements in fasting blood glucose, body fat percentage, and lean mass. The study emphasizes the need for public policies that address the emotional and social issues of women with obesity. The protocol offers an innovative, low-cost approach to obesity treatment, especially within public health systems, focusing on overall well-being.
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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_226

HYPOTHESIS ABOUT LINKS BETWEEN SOME BIOLOGICAL MARKERS AND SOME TYPE 2 DIABETES COMPLICATIONS

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BACKGROUND AND OBJECTIVES
Diabetes is a chronic multifactorial disease with increasingly frequent complications. The aim of our study was to investigate associations between some biological markers and some complications of type 2 diabetes.

METHODS
Our study is retrospective conducted on type 2 diabetes patients with at least one degenerative complication. This study took place between May 2023 and August 2024. Assessment of diabetic neuropathy was made by the DN4 score (positive if >=4).

RESULTS
A total of 82 patients were included. There was a female predominance (gender ratio:1.28). The average age was 61.09 years old ± 10.11. The mean duration of diabetes was 12.78 years ± 9.21. Obesity was present in 33.9% of the cases. Chronic renal failure was present in only 6.2% of cases.Two-thirds (66.7%) of the patients were on insulin therapy.The major complications observed were respectively: diabetic retinopathy (34.4%), diabetic neuropathy (31.2%), and diabetic nephropathy (29.3%). The median of DN4 score was 2 IQR[0; 4].The mean HbA1c was 12%± 2.96%. The mean of serum calcium level, phosphoremia, magnesemia, uremia and uratemia were respectively 2.37 mmol/l ±0.10; 1.14 mmol/l ±0.17; 0.75 mmol/l ±0.09; 5.87mmol/l± 1.67 and 279.88 µmol/l± 98.80.
As for the clearance of creatinine, it had a mean of 93.54 ml/min ± 20.41.The median of microalbuminuria was 9mg/24h IQR[5; 40]. There was a positive correlation between phosphoremia and DN4 score (p=0.009; r= 0.269), between phosphoremia and microalbuminuria (p=0.049; r=0.226), between magnesemia and the duration of diabetes (p=0.022; r=0.255), between magnesemia and uremia (p=0.022; r=0.257).
As for the negative correlation, it was observed between serum calcium level and microalbuminuria (p=0.020; r=0.-259), between BMI and microalbuminuria (p=0.023, r=-0.293), between uratemia and HBA1C (p=0.046; r=-0.224), between duration of diabetes and creatinine clearance (p=0.019; r=-0.263).

CONCLUSIONS
As phosphoremia increases, neuropathy increases, while nephropathy is associated with higher magnesemia and lower serum calcium level. These two complications seem to be associated. On the other hand, the older diabetes is, the more magnesemia and uremia decrease and clearance of creatinine increases; no controlled diabetes seems to be associated with low urate levels.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_227

DIETARY INTAKE OF CALCIUM AND PHOSPHOROUS: ARE THEY ADEQUATE IN CHRONIC KIDNEY DISEASE PATIENTS IN SERBIA?

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BACKGROUND AND OBJECTIVES
Disturbances in bone and mineral metabolism are highly prevalent among patients with chronic kidney disease (CKD), significantly affecting their quality of life and morbidity. Dietary calcium restriction is often the first-line intervention to mitigate the progression of these disorders. However, inadequate calcium intake can be as detrimental as excessive exogenous calcium load. Concurrently, elevated dietary phosphorus intake in known to exacerbate bone remodeling process. Despite the importance of these nutrients, data on their dietary intake in CKD patients, especially within the Serbian population, remain scarce. Therefore, this study aimed to assess the dietary intake of nutrients essential for bone health, calcium and phosphorus, in a cohort of CKD patients.

METHODS
This study included 77 patients with CKD, (36 pre-dialysis, 41 on hemodialysis). Three repeated 24-h recalls were used for assessment of dietary intake. Serum levels of fasting glucose, total, LDL-, and HDL-cholesterol, triacylglycerol, urea, creatinine, parathyroid hormone, and vitamin D were determined using standardized commercial assay kits. Statistical analyses were conducted using the Mann-Whitney U test and Pearson's correlation test.

RESULTS
Inadequate dietary intake of calcium and phosphorous was found in 61% and 69% of CKD patients, respectively. In this cohort, the estimated median daily intake was 716 mg for calcium and 934 mg for phosphorus. No statistically significant differences were observed in calcium and phosphorus intake between the pre-dialysis and hemodialysis groups. In two patients, total daily calcium intake surpassed the suggested maximum of 1500 mg, whereas in 45 patients, it was below the recommended 800 mg/day (recommended value: 800-1000mg, and not more than 1500 mg/day). In all cases of inadequate phosphorus intake, consumption exceeded the CKD-recommended threshold of 800 mg/day, with a strong positive correlation observed between phosphorus and protein intake (Pearson's index 0.906, $p<0.001$). Finally, the median calcium-to-phosphorus intake ratio was 0.769, indicating a suboptimal balance far below the recommended range of 1–2:1.

CONCLUSIONS
The RESULTS of this study indicate that nutritional management in CKD should prioritize meeting requirements for calcium and phosphorous, essential nutrients for bone health. Such interventions could play a pivotal role in mitigating bone and mineral metabolism disturbances and improving patient outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_229

PERINATAL HEALTH STATUS OF WOMEN WITH PRE-PREGNANCY DIABETES MELLITUS AND ITS RELATIONSHIP WITH INFANT HEALTH

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BACKGROUND AND OBJECTIVES
The prevalence of diabetes has been increasing annually, with a noticeable trend toward younger age groups. Women's increased access to education and participation in the workforce may contribute to delayed childbearing. In the past, pregnancies among women with diabetes were primarily associated with type 1 diabetes. However, in recent years, there has been a rising trend in pregnancies among women with type 2 diabetes.
This study analyzes past electronic medical records from the hospital to investigate the effectiveness of nutritional therapy and to identify common dietary issues among pregnant women with diabetes. The findings aim to serve as a reference and guide for future nutrition education initiatives.

METHODS
To investigate the blood sugar control status of women with pre-gestational diabetes in the past 2012-2022 by reviewing medical records.
Sampling criteria: 1. Pregnant patients with type 1 and type 2 diabetes
2. Newborns born to mothers with type 1 and type 2 diabetes
The data were analyzed using SPSS statistical software for descriptive and inferential statistics.

RESULTS
We reviewed electronic medical records from Taichung Veterans General Hospital from 2012 to 2022, identifying a total of 118 cases were diagnosed with diabetes prior to pregnancy. The data indicated that there were no statistically significant differences in age, DM type, or mode of delivery between subjects who received nutrition education and those who did not. We found that both groups had a high proportion of cesarean deliveries, with 69.8% in the with ND group and 66.7% in the without ND group. The pre-pregnancy BMI in the without ND group was significantly higher than that in the with ND group; however, there was no statistically significant difference in weight gain during pregnancy between the two groups. Of these, The distribution of nutrition counseling in each trimester was: 27 times in the first trimester, 9 times in the second trimester, and 5 times in the third trimester, totaling 41 times, accounting for about 34.7%. Blood sugar and HbA1c levels dropped significantly before and after nutrition counseling (p=0.001, 0.002).

CONCLUSIONS
This suggests that multiple sessions of nutrition education help individuals better understand dietary control concepts and effectively implement dietary control plans.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_231

HEALTH-RELATED QUALITY OF LIFE AMONG PEOPLE LIVING WITH HYPERTENSION AND DIABETES CO-MORBIDITY IN RURAL BANGLADESH

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BACKGROUND AND OBJECTIVES
The growing prevalence of hypertension and diabetes is leading to a rising number of individuals with hypertension and diabetes co-morbidity. Individuals with any comorbidity often show poorer health status. The objective of this study was to assess the health-related quality-of-life status among individuals living with hypertension and diabetes comorbidity in rural Bangladesh and identify factors associated with quality of life.

METHODS
This cross-sectional quantitative study was conducted in a rural setting in Bangladesh. A total of 387 participants were recruited from an ongoing non-communicable disease surveillance project of BRAC James P Grant School of Public Health. To capture data on health-related quality of life, the EuroQoL-5D-5L scale was used. UK utility value set scores were utilized to get final index scores for health-related quality of life. Scores were categorized into three levels (poor, average, and good) by separating into three equal quartiles. Ordinal logistic regression was used to examine associations with various factors using STATA 17.0.

RESULTS
The average age of the participants was 54.13 years, with a majority being women (61.76%), unemployed (59.92%), and one-fourth of the participants lacking formal education (25.32%). The mean quality of life status score was 0.749 (±0.23). A majority (65.89%) of the participants reported problems in the pain and discomfort dimension among five dimensions of EuroQoL-5D-5L scale. Increasing age (AOR = 0.97, 95% CI: 0.95 to 1.00, p = 0.004), being female (AOR = 0.29, 95% CI: 0.13 to 0.63, p = 0.002), having other diseases (AOR = 0.43, 95% CI: 0.26 to 0.69, p = 0.000), consuming less amount of food with high salt content (AOR = 0.49, 95% CI: 0.29 to 0.85, p = 0.01) were found to have lower odds of poor health-related quality of life.

CONCLUSIONS
Since consuming less amount of food high in salt was found to have a link with less chance of having a poor quality of life, the government of Bangladesh should focus on educating people to adopt healthy eating practices with food having less salt in the rural context. In addition, a longitudinal study is needed to better understand the relationships between various factors and how they may influence one another in evaluating quality of life. Integration of measures to improve quality of life in the existing health care can also enhance the well-being of individuals with hypertension and diabetes co-morbidity.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO6_232

APPLYING CANCER PREVENTION RECOMMENDATIONS AT POPULATION LEVEL: A POLICY BLUEPRINT

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BACKGROUND AND OBJECTIVES

There is well established evidence that diet, body weight, nutrition and physical activity influence cancer risk. The WCRF/AICR Cancer Prevention Recommendations [1] summarise this evidence in easy-to-understand statements addressed at individuals that, taken together, constitute an overall way of living healthily to prevent cancer. They have been proven to lower cancer risk [2] and impact living well with and beyond cancer [3]. To encourage the adoption of those recommendations by all and lower cancer risk, governments need to implement population-level policies that create environments promoting healthy behaviours, with regards to diet, weight, alcohol, breastfeeding and physical activity.

METHODS

We mapped the best available evidence on cancer risk, as summarised by the WCRF/AICR Cancer Prevention Recommendations, against policy advice for population-level cancer prevention. We did this by integrating existing World Cancer Research Fund International policy tools, such as the NOURISHING and MOVING policy frameworks, and current World Health Organization (WHO) guidance relevant to cancer prevention policy. The latter includes the WHO noncommunicable diseases (NCDs) Best Buys, the Global action plan on physical activity, the Global action plan on alcohol, and the International Code of Marketing of Breastmilk Substitutes.

RESULTS

The policy blueprint presents a package of policy recommendations across 8 key policy areas that apply across diet, weight, alcohol, breastfeeding and physical activity and includes principles for policy design and implementation. The potential co-benefits of cancer prevention policies in relation to prevention of NCDs, contributing to sustainability targets, reversing health inequities, addressing commercial determinants of health and fulfilling human rights are also assessed, as well as potential trade-offs when policy goals do not align. Accompanying policy factsheets present in-depth analysis on how to each relevant cancer risk factor can be addressed through population-level policies.

CONCLUSIONS

A resource for policymakers and advocates, the Policy Blueprint integrates for the first time WCRF/AICR's Cancer Prevention Recommendations with population-level policy advice. It promotes an integrated approach to policy development on healthy diets and weight, breastfeeding, physical activity and to reduce alcohol intake, with the aim of preventing cancer and supporting healthier environments for people living with and beyond cancer.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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Precision and clinical nutrition

EPO7 - Precision and clinical nutrition

EPO7_006

DIGITAL ASSESSMENT OF LIFESTYLE ADHERENCE TO CANCER PREVENTION GUIDELINES AMONG BRAZILIAN BREAST CANCER SURVIVORS

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BACKGROUND AND OBJECTIVES
Breast cancer is the most common cancer among women globally and in Brazil. After treatment, recurrence has a 48.5% chance within 5 years post-diagnosis. Modifiable factors like inadequate diet and sedentary lifestyle are strongly linked to both primary and secondary cancers, with breast cancer survivors showing worse dietary and lifestyle patterns compared to the general population. This underscores the importance of adhering to evidence-based healthy lifestyle recommendations, such as those published in 2018 by the World Cancer Research Fund (WCRF) and the American Institute for Cancer Research (AICR). Lifestyle self-assessment tools can promote adherence to these recommendations by motivating behavioral changes. However, no self-assessment questionnaire for adherence to the WCRF/AICR recommendations has been identified for the Brazilian breast cancer survivors. Therefore, this study aimed to evaluate adherence to the WCRF/AICR recommendations among Brazilian women using a self-administered instrument.

METHODS
This cross-sectional pilot study utilized a self-administered digital instrument specifically developed for the research. The tool was applied to women with breast cancer in the southern region of Brazil. The instrument evaluated components of the WCRF/AICR recommendations, including body weight, eating habits, and alcohol consumption. The components generated an individual score and a total score (sum of components with a range of 0 to 10 points). Scores were classified as follows: low adherence (0-3 points), moderate adherence (4-7 points), and high adherence (8-10 points), reflecting the level of compliance with the recommendations.

RESULTS
The study included 44 participants with an average age of 49 years. The average total score was 7 points (standard deviation 1.05), indicating moderate adherence to the WCRF/AICR recommendations. Participants had a mean body mass index (BMI) of 27.8 kg/m², which is classified as overweight for adults according to the World Health Organization. The average daily consumption of fruits and vegetables was 429 g, meeting the recommended intake of plant-based foods. However, regular alcohol consumption was reported by 27 participants (61.3%), which may represent a risk factor for cancer recurrence.

CONCLUSIONS
The self-administered instrument identified vulnerable aspects of the participants' lifestyle, underscoring the importance of educational interventions in primary care to promote cancer prevention and reduce the risk of recurrence.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_007

ASSOCIATION OF NUTRITIONAL THERAPY WITH CLINICAL OUTCOMES IN CRITICALLY ILL COVID-19 PATIENTS: A RETROSPECTIVE OBSERVATIONAL STUDY

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BACKGROUND AND OBJECTIVES
The COVID-19 pandemic has challenged ICU care globally. Studies show that appropriate nutritional therapy can improve outcomes and recovery for COVID-19 patients. This study analyzes data from severe cases in our ICU to assess how enteral nutrition affects hospitalization length and respirator use duration.

METHODS
This study is a retrospective analysis to identify patients with severe COVID-19 who were admitted to the ICU at our institution from January 2021 to December 2022.
Independent sample t-tests and one-way ANOVA were used to explore the differences in ICU stay length and total hospitalization days across variables. Subsequently, Pearson correlation analysis was conducted to investigate the relationships between continuous variables and chi-square tests were applied to examine the differences in mortality rates at discharge among patients with different characteristics.

RESULTS
A total of 122 cases were included in the statistical analysis. Most patients were discharged alive, totaling 90 cases (73.8%). The average ICU stay was 9.52 ± 9.53 days. Patients who required mechanical ventilation tended to have longer ICU stays. Higher serum albumin levels were associated with shorter ICU stays, while patients with hypophosphatemia had longer ICU stays than those without. The deceased patients had significantly lower average weight and BMI than the survivors. A regression model analysis showed that the type of ventilator used, duration of ventilator use, serum albumin levels, and the presence of hypophosphatemia jointly influenced the length of ICU stay, with an explanatory power of 74.5%.

CONCLUSIONS
The study found that initial nutritional status, especially weight, BMI, and serum albumin levels, significantly impacted COVID-19 patient outcomes. Higher serum albumin levels were linked to shorter ICU stays, and early caloric and protein intake improved survival rates. Monitoring and correcting serum phosphate levels also helped reduce ICU stay length. Overall, good nutritional care was crucial for better recovery, shortening both ICU and total hospital stay durations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_008

EFFECTS OF THE BURDEN OF MEDICAL EXPENSES ON MEDICAL CARE IN PATIENTS WITH TYPE 1 DIABETES MELLITUS

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BACKGROUND AND OBJECTIVES
[BACKGROUND AND OBJECTIVES**]** Type 1 diabetes requires lifelong insulin therapy, which is essential for survival. This necessity of continuous, life-sustaining treatment is believed to have significant impacts not only on the physical aspects of a patient's life but also on psychological and social dimensions. Additionally, many patients are diagnosed in childhood, and it is said that the financial burden and anxiety about their future are extremely significant. However, there is a lack of nationally collected survey data on these issues. To address this, the Japan IDDM Network, a certified non-profit organization and a national body for type 1 diabetes patients, conducted a survey. The purpose was to understand the living conditions related to treatment among type 1 diabetes patients and their caregivers. The collected data serves as foundational material for making policy recommendations to the government regarding the current challenges faced by these patients.

METHODS
[Method] The survey targeted type 1 diabetes patients and their families across Japan. It was conducted via an online questionnaire set up by the Japan IDDM Network from January to March 2024. The number of respondents was 780.

RESULTS
[RESULTS] Among the respondents, 30.1% experienced onset of the disease before the age of 10, which was the largest group, followed by those in their teens and twenties. The monthly out-of-pocket medical expenses were less than 10,000 yen for 37.3% of respondents and less than 20,000 yen for 41.4%. The perceived burden of monthly medical expenses was reported as follows: 33.5% found it "very heavy," 21.9% found it "somewhat heavy," and 25.0% indicated that while it was "not heavy," they still desired a reduction.

CONCLUSIONS
[CONCLUSIONS**]** In the individual responses to the survey, there were pressing comments such as: "Medical expenses are high," "I want to use a pump, but the additional cost would be too burdensome," "It's difficult to make ends meet with living expenses," "The cost of snacks for managing hypoglycemia is a burden," "I have to take time off work to attend medical appointments," and "The proportion of medical expenses to my income is too large. " It was found that, especially for younger patients, the out-of-pocket medical expenses constitute a significant portion of their income, and financial assistance for using beneficial medical devices is insufficient.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_009

A CHANGE-POINT REGRESSION MODEL FOR ESTIMATING THE EFFECTS OF FUNCTIONAL FOODS ON MUSCLE STRENGTH IN THE ELDERLY

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BACKGROUND AND OBJECTIVES

The change-point regression model (CPRM) is a valid method of analysis for assessing the effectiveness of nutraceuticals and functional foods. When clinical trials are conducted using muscle strength as an indicator in the elderly, it is difficult to analyze using the usual testing methods due to the large individual differences in muscle strength. In the present study, we applied CPRM to the analysis of the leg muscle-strengthening effects of fish protein supplementation in the elderly (Alaska pollock protein（APP） study) and investigated its usefulness.

METHODS

CPRM：Consider the following CPRM for between-group comparisons of RCT,

$yi = \alpha + b1xi + b2I(xi - xcp)(xi > xcp)gi + ei \quad (i = 1,2,3,\ldots n)$

where n is the number of participants, yi is the leg muscle strength at the study's end of participant i, xi is the leg muscle strength at baseline of participant i, xcp is a constant, gi is the group indicator (control = 0; treatment = 1), and $I(\cdot)$ is an indicator function defined as $I(xi > xcp) = 1$, if $xi > xcp$ and as 0 otherwise. The proposed method was applied to APP study data, and the merit of the proposed method was demonstrated by comparing it with the conventional method.

RESULTS

Applied to the APP study data, the RESULTS showed that the CPRM was indicated more fitting to data and power of statistical analysis was stronger than the conventional method. The RESULTS of the CPRM analysis showed that the significant increase in leg muscle strength with APP is effective when the pre-intervention leg muscle strength is 15.5 (kgf) or higher (p=0.03).

CONCLUSIONS

We have proposed a new approach to evaluate the efficacy of functional foods on muscle strength in the elderly based on a CPRM, and the merit of the method was demonstrated by comparing it with the conventional method.

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CONFLICTS OF INTERESTS

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EPO7_010

THE PREVALENCE OF FOOD ADDICTION AND ITS ASSOCIATION WITH FAST FOOD CONSUMPTION PATTERNS IN DIABETIC PATIENTS: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
Diabetes mellitus, including both type 1 and 2 diabetes, as well as other subtypes, is a significant public health issue in many parts of the world. The interlink between Diabetes and food addiction (FA) is complex due to the link with overweight/obesity, which is a significant risk factor for diabetes. Given the increasing prevalence of diabetes and its related complications, this study looks to evaluate diabetic management that focuses on dietary adherence and food addiction among diabetic patients.

METHODS
A total of 101 patients who are being managed for diabetes mellitus at University College Hospital were recruited. Participants completed the questionnaire on FA, using the modified Yale food addiction scale and Scoff Eating Disorder Scale for eating disorders; the participants' socio-demographic data and dietary habits were considered. Data were analyzed using SPSS, version 29.20. A p-value <0.05 was regarded as statistically significant.

RESULTS
The vast majority (86.1%) of the respondents were food addicted, and 55.4% of them were females. Approximately 64.3% of the respondents who indicated being obese were aged above 60 years. The RESULTS showed no significant relationship between FA and other determinants. Moreover, we found a significant relationship between BMI and age, marital status, occupation, and diabetes type. Furthermore, BMI was found to be significantly correlated with weight and FBS. The RESULTS in this sample study show that FA was significantly associated with eating fast food, sleeping too much, anxiety, and feeling afraid as if something awful might happen.

CONCLUSIONS
The research findings show that FA is high in diabetic patients, which exposes them to more complications of diabetes, causing adverse health consequences, and this dangerous dietary pattern directly compromises their therapy in the management of diabetes and metabolic control and confers medical complication risk and is associated with increased mortality and morbidity in diabetes which is caused by mental health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_011

PREVALENCE AND ASSOCIATED BODY COMPOSITION FACTORS OF SARCOPENIA IN COMMUNITY-DWELLING OLDER ADULTS

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BACKGROUND AND OBJECTIVES
The objective of this investigation was to examine the frequency and determinants related to body composition of sarcopenia among aging individuals residing in the Beijing community through implementation of the diagnostic criteria for sarcopenia outlined by the 2019 Asian Working Group for Sarcopenia (AWGS).

METHODS
A cross-sectional examination employing multistage cluster sampling was conducted on a sample consisting of 933 individuals aged 50 years or above. The study utilized the AWGS 2019 criteria for muscle mass, muscle strength, and physical function to gauge sarcopenia. Additionally, data on demographic characteristics, anthropometry, and body composition were collected. Logistic regression analysis was carried out to ascertain the relationships between sarcopenia and correlated factors.

RESULTS
The study found that the overall prevalence of sarcopenia was 8.3%. Sex ($p<0.001$) and body mass index (BMI $p<0.001$) were determined to have a significant association with the occurrence of sarcopenia. The adjusted analyses demonstrated that with each standard deviation increase in fat-free mass index (OR=0.02, of 95%), skeletal muscle mass (OR=0.17, of 95%), and other body composition indicators (including Total Body Water, Intracellular Water, Protein, Soft Lean Mass, BMI, Body Cell Mass, OR<0.60, of 95%), the risk of sarcopenia decreased by more than 40%. Certain straightforwardly accessible anthropometric indices such as upper arm circumference (correlation coefficient 0.94(0.9-0.97), 0.97(0.95-1), 1.01(0.99-1.03) respectively, of 95%), waist circumference (0.94(0.92-0.96), 1.01(0.99-1.03), 1.02(1-1.03), of 95%), hip circumference (0.93(0.9-0.96), 0.99(0.97-1.02), 1.02(1-1.04), of 95%), waist-to-hip ratio (0.93(0.87-1), 1.04(1-1.08), 1(0.97-1.03), of 95%), body fat percentage (1(0.98-1.02), 1.02(1-1.04), 1.01(0.99-1.02), of 95%), and phase angle (0.91(0.89-0.93), 0.96(0.94-0.98), 0.99(0.98-1), of 95%) exhibited substantial correlation with skeletal muscle index, muscle strength or physical performance. However, no noteworthy link between sarcopenia and most variables associated with physical function was discovered.

CONCLUSIONS
The findings of the study highlight the prevalence of sarcopenia among the aging residents of Beijing. Certain easily measured anthropometric indices demonstrated strong correlation with muscle strength or physical performance, thereby providing an avenue for screening and diagnosing sarcopenia in older people who may not be able to undergo grip strength or physical function assessments.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_013

ADEQUATE TRACE ELEMENT INTAKE MIGHT AMELIORATE MAJOR ADVERSE KIDNEY EVENTS IN CRITICALLY ILL PATIENTS

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BACKGROUND AND OBJECTIVES
Critically ill patients might have altered trace element metabolism and frequently appear concurrent with acute kidney injury (AKI). We assessed the association of trace element intake with kidney function outcomes in critically ill patients.

METHODS
We included patients older than 20 years old and stayed in the intensive care unit (ICU) for more than 48 hours. Patients were allocated to non-AKI or AKI groups based on whether they occurred AKI at admission. The patients' clinical and hematological data were collected, and plasma selenium, zinc, and copper concentrations were measured on the ICU's 1st day and 7th day. The mean 7-day nutrient intake from enteral nutrition and intravenous fluid infusions was recorded and calculated. The outcome of kidney function was applied to the major adverse kidney events within 14 days and 28 days (MAKE14 and MAKE28) based on the patient's dialysis provision, sustained loss of kidney function, and/or death on the 14th and 28th day after admission to the ICU.

RESULTS
AKI occurred in 56 out of 124 patients (54.8%) at admission. AKI patients had significantly lower estimated glomerular filtration rate levels and higher serum creatinine concentration than non-AKI patients on the 1st and 7th days in the ICU. Non-AKI patients had a significantly higher mean 7-day energy, protein, carbohydrate, fat, selenium, zinc, and copper intake than AKI patients. Mean selenium, zinc, and copper intakes were negatively associated with MAKE14 and MAKE28 after adjusting for potential confounders. However, plasma selenium, zinc, and copper concentrations on the 1st and 7th days had no association with MAKE14 or MAKE28.

CONCLUSIONS
Adequate intake of trace elements might ameliorate major adverse kidney events in critically ill patients. (This study was supported by a grant from the National Science and Technology Council, Taiwan. NSTC 112-2320-B-040 -009 -MY3)

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_014

A CHANGE-POINT REGRESSION APPROACH FOR ESTIMATING THE THRESHOLD DOSE (TD) -COMPARISON OF RR AND RD-

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BACKGROUND AND OBJECTIVES

The change-point regression model (CPRM) is a valid method of analysis for assessing the effectiveness of nutraceuticals and functional foods. The model is characterized by including the threshold dose (TD) for analysis. In addition, we reported the usefulness of the weighted CPRM (w-CPRM), which is weighted by the heterogeneity between clinical trials in a meta-analysis for amino acid safety assessment. We used the risk difference (RD) for the dependent variable when fitting the data to the model, thus avoiding the problem of zero cells. However, RD cannot assess the intensity of risk and the risk ratio (RR) must be used as the dependent variable to assess intensity. To achieve this, the solution to the zero-cell problem is a challenge. Therefore, in this study, we investigated the pre-processing for RR data and the new w-CPRM application for RR data. The RESULTS were also compared with those obtained using RD data.

METHODS

The w-CPRM shows below.

$\omega i^* yi = \omega i^* \beta \mathrm{I}(xi > xcp)(xi - xcp) + \omega i^* \varepsilon i$

where yi and xi are the logarithmic transformation value of RR and dose for the i-th study, respectively, and xcp is the unknown change point or threshold. $\mathrm{I}(\cdot)$ is an indicator function defined as $\mathrm{I}(xi > xcp) = 1$ if $xi > xcp$ and is 0 otherwise. ωi is the weight of the i-th study with DerSimonian-Laird method.

We added 0.5 to both cells respectively when the either cell was 0 for solving the problem of zero cells.

RESULTS

Applied to the L-Arg study data, the RESULTS showed that 7480mg/ one-time dose as the TD. That is quite close to the TD when RD data was used (7531mg/ one-time dose). The feasibility of applying CPRM was confirmed by comparing it to a linear regression model with AIC as an index.

CONCLUSIONS

We found that w-CPRM can use RR as well as RD when RR data insert to the model after the problem of zero cells appropriately modified. This approach helps to estimate the TD using RR data that wasn't used before. This research was supported by the research program on the development of innovative technology grants from the Project of the Bio-oriented Technology Research Advancement Institution (BRAIN: JPJ007097-04013B2).

CONFLICTS OF INTERESTS

Prof. Hayamizu conducts this research supported by the research program on the development of innovative technology grants from the Project of the Bio-oriented Technology Research Advancement Institution

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EPO7_015

ADAPTING A NUTRITION-RELATED QUALITY OF LIFE MEASURE TO A CANCER POPULATION

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BACKGROUND AND OBJECTIVES

The association between malnutrition and quality of life among patients with cancer is well-known. An understudied aspect in this population is whether nutrition interventions, beyond improving nutrition status, can enhance nutrition-related quality of life. However, concise questionnaires for assessing this in the context of cancer-related malnutrition is lacking. The Satisfaction With Food-related Life scale (SWFL-scale) has been validated in several languages, including Swedish, but not for a cancer population. This study aimed to assess the face validity of the SWFL-scale(1) in a cancer population with malnutrition or risk of it.

METHODS

The SWFL-scale was tested through cognitive interviews using the verbal-probing technique (2). Six patients treated for cancer (head and neck cancer, n = 5; lung cancer, n=1), recruited via patient organizations, participated. It consists of five questions, with responses on a seven-point Likert scale. The measure is intended to assess a broad perspective on food and meals, including planning, shopping, cooking, and the act of eating. Interviews were conducted in Swedish and were recorded. Ethical approval was obtained for the study.

RESULTS

Of the five SWFL questions, three were easy to understand and answer and should remain unchanged for this patient group (Table 1). Although food and meals are distinct concepts, combining the terms encouraged broader thinking. Two questions needed minor rephrasing in the Swedish translation. For instance, "conditions of my life" was difficult to relate to "regard to food" which could possibly be explained by respondents having faced a cancer diagnosis. Overall, the patients found the scale to capture relevant aspects.

Table 1 The questions included in the SWFL scale and RESULTS

Food and meals are positive elements in my life	Unchanged
I am generally pleased with my food	Rephrased
My life in relation to food and meals is close to my ideal	Unchanged
Food and meals give me satisfaction in daily life	Unchanged
With regard to food, the conditions of my life are excellent	Rephrased

CONCLUSIONS

The SWFL scale is a suitable tool, with minor refinements needed in the translation to Swedish of two questions, for use in a population with cancer. Utilizing this scale in studies on nutrition therapy for cancer-related malnutrition could help determine if nutrition-related quality of life is affected. However, further assessment of construct validity is needed.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_016

FROM INSIGHTS TO ACTION: NURSING EDUCATION TO IMPROVE ORAL NUTRITION SUPPLEMENTS ADMINISTRATION IN ACUTE CARE

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BACKGROUND AND OBJECTIVES

Malnutrition worsens patient outcomes and increases healthcare costs. Barriers to effective nutritional care, including knowledge gaps and staff attitudes, are well-documented (van den Berg et al., 2023). Observational findings at an acute care hospital revealed poor adherence to Oral Nutritional Supplement (ONS) administration. A quality improvement initiative with nursing staff used focus groups to identify key barriers, including limited knowledge, workflow challenges, and attitudes toward ONS. This initiative aimed to pilot a nursing education programme to address barriers and enhance ONS-related practices.

METHODS

A training programme covering malnutrition, nutrition importance, ONS types, and practical strategies was piloted with 50 nurses. Pre- and post-training questionnaires assessed knowledge, confidence, and attitudes. Mann-Whitney U tests, chosen for non-parametric data, compared pre- and post-training responses. Cohen's *d*, calculated using means and pooled standard deviations, quantified effect sizes. *p*-values <0.05 were considered statistically significant. Participants' feedback assessed satisfaction and relevance.

RESULTS

All outcomes showed p<0.001, indicating a high level of statistical significance, including malnutrition (U=133.0, p<0.001, d=2.6) and the importance of nutrition (U=290.0, p<0.001, d=2.0). Confidence in explaining ONS rationale to patients and families also increased (U=385.0, p<0.001, d=1.5). Intentions to implement ONS-related practices improved significantly: encouraging patients to take ONS (U=571.0, p<0.001, d=1.2), checking adherence (U=684.5, p<0.001, d=1.0), and considering patient preferences during handovers (U=538, p<0.001, d=1.2). Participants rated the training highly (94%), intended to apply the knowledge (92%), and 80% recommended annual retraining. Qualitative feedback highlighted the programme's practical relevance. Large effect sizes, typical of impact evaluations, reflect the training's impact on knowledge and confidence.

CONCLUSIONS

This initiative demonstrates the effectiveness of a tailored nursing education programme in improving knowledge, confidence, and ONS-related practices. Statistically significant improvements and high satisfaction validate its relevance. Mandatory training aligned with behavioural change models can sustain long-term clinical improvements. This programme offers a scalable approach to address global malnutrition through tailored clinical education.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_018

HOW DO DIETITIANS FROM THE PROVINCE OF QUEBEC LEVERAGE EATING PLEASURE IN THEIR WORK WITH HIGHER WEIGHT INDIVIDUALS?

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BACKGROUND AND OBJECTIVES
Many people with higher weight are preoccupied with their body size and food consumption(1). This can lead them to consult dietitians to change their eating habits. Eating pleasure is a promising approach to promote both healthy eating and a positive relationship with food(2). This qualitative study explores if and how eating pleasure is used by dietitians in their clinical interventions with higher weight individuals.

METHODS
Registered dietitians (n=19) from various clinical settings in the province of Quebec, Canada, were recruited online through social media and the research center's website. After filling out a sociodemographic questionnaire, they participated in an in-depth online interview exploring their use of eating pleasure in their clinical practice when working with higher weight patients, including key areas of intervention as well as barriers and facilitators. Semi-structured interviews were conducted by a PhD student and transcribed verbatim by two research assistants. They were then reviewed, imported and thematically analyzed using the NViVo software based on a coding frame created by the research team. The first five interviews were double coded by the PhD student and the research coordinator, and all discrepancies were discussed and resolved. The PhD student coded the remaining interviews, which then were reviewed by the research coordinator.

RESULTS
All dietitians reported leveraging eating pleasure in their clinical practice with higher weight patients. Key areas of pleasure-based interventions were 1) Food preparation 2) Food preferences, 3) Health considerations, 4) Social experiences, and 5) Psychological/physical state surrounding food intake. The most frequently named barrier to the use of eating pleasure was patients having a negative relationship with food (e.g., food guilt). Aspects of the sociocultural environment were also considered barriers to using eating pleasure, particularly those related to weight stigma and diet culture. Dietitians mentioned that patients who expressed openness to eating pleasure was an important facilitator. They also mentioned that different methods could be useful in facilitating the adoption of a pleasure-based clinical practice, such as establishing trust and addressing pleasure-related myths.

CONCLUSIONS
Dietitians working with higher weight individuals use eating pleasure in various aspects of their practice. Future research focusing on leveraging eating pleasure to promote healthy eating among this population should include strategies fostering a positive relationship with food and build resilience against weight stigmatizing messages.
(Funded by CIHR)

CONFLICTS OF INTERESTS
The first author co-owns a continuing education platform for health professionals focusing on the weight-inclusive approach.

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EPO7_020

ASSOCIATION BETWEEN OXIDATIVE BALANCE SCORE AND THE PROGNOSIS OF COLORECTAL CANCER PATIENTS

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BACKGROUND AND OBJECTIVES
Colorectal cancer is one of the most common malignant tumors globally. Research has demonstrated that oxidative stress plays a significant role in the development and progression of colorectal cancer. The oxidative balance score (OBS) is a comprehensive measure that evaluates the burden of oxidative stress in individuals by considering both pro-oxidative and antioxidant dietary and lifestyle factors. However, few studies have examined the relationship between OBS and colorectal cancer prognosis. This study aimed to evaluate the association between OBS and the prognosis of colorectal cancer patients.

METHODS
A total of 2799 colorectal cancer patients from the Guangdong Colorectal Cancer Cohort, enrolled at baseline in 2010, were followed for mortality outcomes through 2023. Dietary data were collected using a food frequency questionnaire, which assessed the participants' diet over the year prior to their diagnosis. The OBS includes dietary components such as phytochemicals, vitamins, minerals, and fats, as well as lifestyle factors including smoking, alcohol consumption, obesity, and physical activity. A higher OBS score reflects greater exposure to antioxidants. Multivariable Cox proportional hazards regression models were used to estimate the hazard ratios (HR) and 95% confidence intervals (CI) for the association between the OBS and both all-cause mortality and colorectal cancer-specific mortality. Subgroup analyses were conducted based on cancer site.

RESULTS
The RESULTS showed that OBS was significantly and inversely associated with both overall mortality and colorectal cancer-specific mortality. The adjusted HRs for individuals in the highest versus the lowest quartile of OBS were 0.79 (95% CI: 0.63-1.00) for overall mortality and 0.77 (95% CI: 0.60-0.98) for colorectal cancer-specific mortality. Subgroup analysis by cancer site revealed that a high OBS was significantly associated with improved overall and colorectal cancer-specific survival in patients diagnosed with rectal cancer.

CONCLUSIONS
These findings suggest that a high OBS may be linked to better survival outcomes in colorectal cancer patients.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_021

ASSOCIATION BETWEEN ANEMIA AND ORAL HEALTH OF UNDERSERVED US PREGNANT WOMEN

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BACKGROUND AND OBJECTIVES
To assess the effects of anemia, pica practices, and oral health status among pregnant women.

METHODS
A cross-sectional study was conducted among pregnant women in New York. Demographic, medical history, and oral hygiene practice data were collected using validated questionnaires. Comprehensive oral examinations included DMFT (decayed, missing, filled teeth), DMFS (decayed, missing, filled surface), and periodontal status (plaque index (PI) and bleeding on probing (BOP). We compared the oral clinical measures among participants with anemia and non-anemia, and pica and without pica using the Fisher exact, Independent sample t-tests, and Mann-Whitney U tests on SPSS software.

RESULTS
Among 20 women enrolled (8 (40%) with pica and 12 (60%) without pica), 25% had an anemia history, and the mean gestational age was 25.55 ± 8.8 weeks. Women with pica reported markedly higher prevalence of anemia (50%) compared to non-pica participants (8.3%) ($p < 0.05$). The pica group exhibited worse oral health, showing more decayed-missing-filled teeth and surfaces than the non-pica counterparts ($p < 0.05$). The overall mean DMFT and DMFS were 5.6 ± 4.4 and 9.85 ± 9.1 respectively. The total mean PI was 0.67 ± 0.5 and BOP was 3.2 ± 5.6. Anemia was not associated with DMFT, DMFS, BOP, or PI.

CONCLUSIONS
Pica practices were associated with maternal poor oral health. As these novel findings could have critical implications for oral diseases and treatment, during pregnancy, we recommend the study is replicated with a larger sample size and explore mechanisms.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_022

CREATION OF A TOOL FOR IMPLEMENTING A 2:1 KETOGENIC DIET IN CHILDREN - IMPROVING THE DIETARY MANAGEMENT OF CHILDREN WITH REFRACTORY EPILEPSY AND NEUROMETABOLIC DISEASES

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BACKGROUND AND OBJECTIVES

Fasting has long been described as a treatment for epilepsy. The ketogenic diet induces the same physiological processes as prolonged fasting by providing energy from lipids rather than carbohydrates. It has therefore been used since 1921 as a non-pharmacological treatment for refractory epilepsy. It is also indicated for certain metabolic disorders. The classic versions of this extremely restrictive diet (4:1 and 3:1 ratios) completely exclude starchy foods.In recent years, a new ratio has emerged: 2:1 (2g of fat to 1g of protein and carbohydrate). This allows starchy foods to be consumed in small quantities.
The aim of this work is to make it easier for parents of children on a 2:1 ketogenic diet to choose starchy foods. This will be done by creating a tool that shows the carbohydrate equivalents of different types of starch, including new products that have appeared on the market in recent years (e.g. legume based pasta).

METHODS

The work was carried out in several stages. The first was to revise the recipes created by the partner hospital for this project in a 2:1 ratio to meet the nutritional goals of the most recent consensus on the ketogenic diet. The second step was to create a database containing a large number of starchy foods from different regions of the world and to create 5g carbohydrate equivalents for them. The final and most important step was to create the tool itself. This involved a preliminary survey of families and caregivers about dietary difficulties. This stage made it possible to define the needs of the target group.

RESULTS

A 29-page ring binder has been produced. It contains a brief explanation of the diet and the types of starch, calculated equivalents (150), recipes (12) and resources. The recipes included in the tool have all been tested. An evaluation was carried out by the partner hospital’s Dietetics and Metabolism teams. They gave our tool an overall score of 9/10. An evaluation with parents of patients is still to be carried out to assess the practical aspect of the tool, whether the objectives set have been achieved and whether it meets the expectations of the target group.

CONCLUSIONS

The ketogenic diet is a complicated and restrictive therapeutic diet, but it has been shown to be effective in the treatment of certain epilepsies and metabolic disorders. This tool, after evaluation with patients' families, could be a way to facilitate the implementation of this diet. By tasting recipes with patients, this work has also shown that it is possible to compose appetising meals with a 2:1 ketogenic ratio.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_023

STAKEHOLDER INVOLVEMENT IN DEVELOPING A HOME-BASED POST DISCHARGE BREASTFEEDING SUPPORT INTERVENTION FOR INFANTS UNDER 6 MONTHS RECOVERING FROM MALNUTRITION TREATMENT

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BACKGROUND AND OBJECTIVES
Guidelines recommend malnourished infants under 6 months (U6M) re-establish exclusive breastfeeding during inpatient care, with community-based follow-up. However, LMICs often lack structured community support. This study engaged stakeholders to develop a home-based breastfeeding support intervention for U6M infants discharged from malnutrition treatment.

METHODS
The study used a participatory approach, reviewing policies and conducting workshops. National guidelines were sourced from Kenya's health portal, international ones from WHO, and relevant PubMed studies were reviewed. Snowball sampling identified stakeholders for interviews, and purposive sampling was used for workshop participants. Three workshops refined intervention components through iterative discussions.

RESULTS
The review identified 12 guidelines and 10 publications on post-discharge care. Literature emphasized intensive counseling, family inclusion, IEC materials, SMS reminders, and frequent visits. Stakeholders proposed components included nutrition counseling, social support, home follow-up by Community Health Promoters (CHPs), food rations, and hands-on skills like knitting. Workshops recommended peer-based breastfeeding counseling, targeted food support for malnourished mothers, SMS reminders, and linking mothers to CHPs. The finalized intervention involves three home visits and three phone calls for individualized breastfeeding support by a peer, establishing a breastfeeding buddy, and linking mothers to CHPs for social support.

CONCLUSIONS
The intervention addresses risk factors identified in literature. Testing among 20 mother-infant pairs shows feasibility and acceptability. An ongoing clinical trial will evaluate its effectiveness in improving clinical outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_026

NUTRITIONAL AND INFLAMMATORY MARKERS ASSOCIATED WITH SERUM INFLIXIMAB TROUGH CONCENTRATIONS IN CROHN'S DISEASE

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BACKGROUND AND OBJECTIVES
Infliximab (IFX) has been shown to be effective in inducing and maintaining remission in Crohn's disease (CD). A higher serum IFX level is associated with a better biochemical, endoscopic, or histological response. A serum IFX level of 3μg/ml is the concentration required for CD treatment. Studies have shown that nutritional and inflammatory status of patients correlates with serum IFX concentrations. This study aims to investigate the nutritional and inflammatory indicators that are correlated with IFX concentration and explore the potential predictors of IFX concentration.

METHODS
This study included 112 CD patients who were admitted tothe research hospital and treated with IFX from October 2019 to December 2022. By compared patients with IFX concentrations ≥ 3μg/ml and those below 3μg/ml at week 14 to investigate the relationship between IFX concentrations and nutritional and inflammatory markers. Receiver operating characteristic (ROC) was adopted to analyze the potential efficacy of these indicators in predicting serum IFX concentrations. Logistic regression analysis was performed to evaluate the potential influencing factors of serum IFX levels.

RESULTS
The Hgb, serum ALB and hand grip strength in patients with serum IFX concentration ≥ 3μg/ml were significantly higher than those in patients with serum IFX < 3μg/ml ($P < 0.05$), while serum sedimentation rate (ESR) and antibodies to infliximab (ATI) positive ratio were significantly lower than those in patients with serum IFX < 3μg/ml group ($P < 0.05$). ROC analysis showed that serum ALB, Hgb and hand grip strength had predictive value for serum IFX concentration ≥ 3μg/ml, and the cutoff values were 37.5g/L and 129.5g/L,19.3kg, respectively. ESR had predictive value for IFX serum concentration < 3μg/ml. The cutoff value was 35mm/h. In multivariate Logistic regression, it was found that serum ALB ≥ 37.5g/L, ESR ≤ 35 mm/h, hand grip strength and ATI were potential influencing factors for serum IFX concentration ≥3μg/ml ($P < 0.05$). And the combined predictor generated by these indicators had better predictive value than the single indicator. The serum concentration of IFX was significantly correlated with the clinical remission of CD patients during the IFX maintenance period ($P < 0.05$).

CONCLUSIONS
Hgb, serum ALB, ESR, grip strength and ATI were potential influencing factors of IFX concentration. Monitoring nutritional and inflammatory markers is helpful to assess IFX concentrations in patients with CD.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_027

ASSOCIATION BETWEEN OLFACTORY CAPACITY, BODY MASS INDEX AND EATING BEHAVIORS IN ADOLESCENTS

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BACKGROUND AND OBJECTIVES

Childhood obesity is a significant global public health problem. The availability of energy-dense and highly palatable foods and increased powerful cues can override homeostatic satiety signals by influencing brain areas related to reward, emotion and olfaction. Olfaction is a sensory function associated with food preferences, intake, and obesity . The olfactory system is linked to the nervous system and can regulate food intake by sensing the metabolic state. Additionally, there is an inverse association between olfactory capacity and body mass index. However, no studies have assessed the possible effect of eating behavior traits on the relation between olfactory capacity and obesity. Aim: To evaluate if the association between olfactory capacity, eating behaviour traits and body mass index in adolescents aged 10-16 years**.**

METHODS

Methods: A cross-sectional study with a sample of 141 Chilean adolescents (45 % female; 56 % male) were recruited. We found that the sample was underweight (7%) and normal weight (36.3%), overweight (27.2%) and obese (29.2%). Anthropometric measurements (weight, height, BMI Z-score), eating behavior, and olfactory capacity was assessed. Eating behavior was assessed using the Child Eating Behavior Questionnaire (CEBQ), and the Food Reinforcement Value Questionnaire (FRVQ). Olfactory capacity was assessed using the Sniffing sticks test method.

RESULTS

RESULTS: Preliminary data show that male showed higher food responsiveness, enjoyment to food and lower satiety responsiveness scores in relation to female (p £ 0.05). In relation to olfactory capacity, adolescents with excess nutrition (overweight and obesity) showed lower discrimination, olfactory identification and TDI score (p=0.05).There was a significant inverse correlation between food responsiveness and olfactory threshold (r = -0.23; p<0.05) and a positive correlation between satiety responsiveness and odor identification score (r = 0.28; p < 0.05).

CONCLUSIONS

CONCLUSIONS: We observed a preliminary association between obesogenic eating behaviors traits and poorer olfaction. These findings may have implications for the understanding of the relation between olfaction and excess energy intake leading to obesity.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_028

EFFECT OF ORAL PROBIOTIC LACTOBACILLUS JOHNSONII TCI250 OR WHITE POMEGRANATE EXTRACT ON SYMPTOMS, OXIDANT STRESS AND ANTIOXIDANT CAPACITY FOR BACTERIAL VAGINOSIS

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BACKGROUND AND OBJECTIVES
Bacterial vaginosis (BV) is the most common cause of vaginal dysbiosis in women, characterized by a depletion of l*actobacilli* and an overgrowth of anaerobic pathogens. Although antibiotic treatment is effective in the short term, recurrence remains a significant clinical challenge. Recent studies suggest that probiotics may play a role in managing and preventing BV. And extracts of white pomegranate (*Punica granatum* Linn) exhibit potent antioxidant and antimicrobial properties, which may contribute to the inhibition of vaginal pathogen growth and the maintenance of vaginal health. This study aimed to evaluate the effect of heat-killed *Lactobacillus johnsonii* TCI250 or white pomegranate extract on symptoms, oxidative stress, and antioxidant capacity in women with BV.

METHODS
Forty-five women with BV were enrolled in this double-blind, placebo-controlled clinical trial. Participants were randomly assigned to three groups: group A (TCI250 heat-killed *Lactobacillus johnsonii* 100mg, n=15), group B (white pomegranate extract 500mg, n=15), and group C (placebo, n=15). Each group received daily supplementation for 8 weeks. The Nugent score, vulvovaginal signs and symptom, oxidative stress, and antioxidant capacity were evaluated at baseline and after 8 weeks of intervention.

RESULTS
The average age of the participants was 27.6 ± 5.2 years, with an adherence rate of 96.3%. No significant changes in Nugent scores were observed in any group. Regarding vulvovaginal symptoms, vaginal discharge and vaginal odor significantly improved in all groups after 8 weeks. Group B showed a reduction in oxidative stress, approaching statistical significance (TBARS: 0.8±0.4 vs 0.6±0.1 μM, p=0.055). Additionally, white pomegranate extract appears to improve itching, (β=-1.374, p=0.057).

CONCLUSIONS
Administration of white pomegranate extract for 8 weeks appears to reduce oxidative stress and improve more symptoms compared to *Lactobacillus johnsonii* TCI250, although the study's statistical power was insufficient. Future research with larger sample sizes and microbiome analysis is necessary to investigate the effects of *Lactobacillus johnsonii* TCI250 and white pomegranate extract on the management of BV.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_029

COMBINING METAGENOMICS AND METABOLOMICS TO EXPLORE MICROBIOTA-METABOLITE DYNAMICS IN HUMAN METABOLIC HEALTH

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BACKGROUND AND OBJECTIVES

The imbalance in the composition and function of the gut microbiota (dysbiosis) has a significant impact on the development of various metabolic disorders, including obesity. However, it remains unclear which microbial taxonomic groups pose a higher or lower risk for obesity and how they relate to the development of metabolic disorders. This study aims to analyse the gut microbiota of Spanish volunteers with normal weight and obesity, explore the relationship between significantly differential bacterial taxa and various physiological variables and with plasma metabolites linked to either adverse or healthy metabolic states.

METHODS

Data from 298 adult volunteers were classified into LOW or HIGH obesity levels according to an obesity index based on the combination of three parameters: body mass index, fat mass, and waist circumference. Differences in the abundance of families, genera, and species between the two groups were studied, both combined and separated by sex. We also examined how the identified taxa correlated with the variables of the obesity index and with statistically significant metabolites associated with high or low obesity levels.

RESULTS

Most of the identified taxa were reduced in individuals with high obesity index (n=162), such as *Gemmiger quciabialis*, *Bifidobacterium longum*, and *Bacteroides cellulosilyticus*, among others. Additionally, these individuals were characterized by an increase in the specie *Clostridium fessum*, whose abundance showed positive correlations with the three variables of the obesity index. In addition, this was the only taxon that showed a statistically significant positive correlation with phosphatidylethanolamine, which was the only metabolite that was found significantly more abundant in the high obesity group.

CONCLUSIONS

Our study reveals that the microbiota of individuals with a high obesity index shows increased abundance of *Clostridium fessum*, correlated to an increase of plasma phosphatidylethanolamine levels. These RESULTS suggest a potential role for this species and this metabolite in the development of this condition and represent a therapeutic target for its control.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_031

HARNESSING ARTIFICIAL INTELLIGENCE TO IMPROVE DIETARY ASSESSMENT FOR PRECISION NUTRITION

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BACKGROUND AND OBJECTIVES
Technologies for precision nutrition research are in high demand in part because nutrition impacts the health of individuals differently. However, the effectiveness of precision nutrition research can be hindered by a lack of accurate tools and the reliance on time-intensive methods for assessing individual dietary intake. Leveraging artificial intelligence (AI) has the potential to enhance the accuracy of dietary intake assessment.
Objective: To conduct a pilot study of the PlantVillage Food Recognition and Nudging Insights (FRANI) mobile AI application by capturing images, recording portion weights of commonly consumed foods, and performing image annotation.

METHODS
Data collection occurred in the University of California Davis Dining Commons (DC) during the summer of 2024, following a 2-week menu cycle. It involved image capture and weighing of foods in two waves: Wave 1 consisted of real-life images of foods taken right before consumption, while Wave 2 consisted of images taken in two contexts – single foods in four standard portions and combination foods as they are typically eaten. Seasonal foods that were not served during the summer will be captured in the fall and winter quarters to expand the food database further. Image annotation and subsequent semantic segmentation model training are currently underway to train PlantVillage FRANI to recognize foods in images.

RESULTS
Approximately 4,000 images representing 251 food classes, along with food portion data (in grams), were collected during the 2024 summer menu cycle. The initial semantic segmentation model was trained with 984 annotated images and achieved a Mean Intersection over Union (MIOU) = 0.441. While these initial RESULTS were promising, visual inspection of the prediction masks suggested that additional Wave 1 training images would help further improve the model's performance.

CONCLUSIONS
Collaboration with the dining commons demonstrated the ease and feasibility of collecting food data in a U.S. college setting to train the AI model. The outcome of this pilot will set the stage for a validity study that compares the accuracy of FRANI to weighed food records and a feasibility study that will investigate the effectiveness of FRANI for future precision nutrition interventions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_033

MALNUTRITION IN PATIENTS WITH DIGESTIVE CANCER: EVALUATION AND MANAGEMENT STRATEGIES

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BACKGROUND AND OBJECTIVES
Malnutrition is a common complication in patients with digestive cancer, negatively impacting prognosis and quality of life. Proper nutritional management is crucial to improving clinical outcomes.
Objective: This study aims to assess the effectiveness of nutritional management strategies in patients with digestive cancer and identify optimal practices.

METHODS
A retrospective cohort study was conducted in the oncology department and the day hospital unit of the Cancer Center in Blida. The study included 102 patients diagnosed with digestive cancer between January 2023 and March 2024.
Both malnourished and non-malnourished patients were evaluated using their medical records and a questionnaire. Data collected included nutritional status indicators such as body weight changes during treatment, body mass index (BMI), dietary intake, and serum albumin levels to assess the severity of nutritional risk. The prevalence of malnutrition was determined, along with demographic characteristics and risk factors associated with malnutrition.

RESULTS
The analysis, with a significance threshold of 0.05, revealed that malnutrition is prevalent among digestive cancer patients (61%), particularly in those with esophageal and liver cancer (100%). The primary diagnostic method was monitoring patients' weight variations.
Regarding malnutrition management, the most common approach was oral nutrition, including dietary and hygienic advice, implemented in 18% of cases. Nutritional interventions were effective in more than half of the patients.
Despite limitations such as a shortage of nutritionists and adequate equipment, as well as the high mortality rate associated with digestive cancers, the RESULTS are promising. They highlight the importance of systematic malnutrition screening protocols from the time of digestive cancer diagnosis.

CONCLUSIONS
The findings underscore the need for enhanced efforts to improve nutritional management through systematic screening and strengthened collaboration among oncologists, nutritionists, and other healthcare professionals to ensure a more coordinated and effective approach.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_034

IN VITRO AND IN VIVO STUDIES ON ANTI-INFLAMMATORY EFFECTS OF ARTEMISIA INDICA WILLD VAR. ORIENTALIS (PAMP.) H. HARA

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BACKGROUND AND OBJECTIVES
Artemisia princeps Pamp. (mugwort) has been used as a folk remedy including hemostatic, relieving skin itching, anti-inflammatory and so on. We focused on the anti-inflammatory effects of *Artemisia indica* Willd var. *orientalis* (Pamp.) H. Hara (nishi-yomogi), a species closely related to *Artemisia indica* var. *maximowiczii* （Nakai） H. Hara (Japanese mugwort). However, there is little information about the anti-inflammatory effects of nishi-yomogi polyphenol to date. Therefore, in this study, we examined the anti-inflammatory effects of nishi-yomogi from Ishigaki and Kume Islands, which have different morphological characteristics using a mouse macrophage cell and an acute inflammation animal model.

METHODS
Polyphenols were extracted from the freeze-dried powder with methanol. Cytotoxicity was examined using the MTT assay. The inflammatory mediator productions, gene and protein expressions in LPS-treated RAW264.7 cells were measured using the Griess method, ELISA kit, real-time PCR and western blotting, respectively. Polyphenol profiles were examined by HPLC. In an acute inflammation study, each polyphenol was administered intraperitoneally to SD rats, followed by administration of carrageenan to the footpad. The footpad volume was measured by plethysmometer. Data are shown as mean ± SEM. For cytotoxicity, each value was compared with the control using the Dunnett test, and for other, comparisons between groups were performed using the Tukey. Differences were considered significant at less than 5%.

RESULTS
From the MTT assay, in vitro study was performed at the concentration of 3 μg/ml polyphenol. In the case of in vitro study, Kume nishi-yomogi polyphenol significantly ($P<0.05$) suppressed NO production, and iNOS and TLR4 gene expressions compared to control, and was also observed the pronounced decreases in the iNOS and TLR4 protein expression levels in the LPS-treated cells. The HPLC RESULTS showed that Kume nishi-yomogi contained an unknown component not found in other mugwort. While, in the case of in vivo study, intraperitoneal administration of Kume nishi-yomogi polyphenol slightly reduced footpad swelling compared to the other groups.

CONCLUSIONS
The anti-inflammatory effects of Kume nishi-yomogi polyphenol were suggested by our studies. Daily consumption of Kume nishi-yomogi might contribute to reduce the inflammation in the body.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_035

PHENOTYPING METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE FROM AN IMMUNOLOGICAL, METABOLIC, AND GUT MICROBIOME PERSPECTIVE

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BACKGROUND AND OBJECTIVES
Metabolic dysfunction-associated steatotic liver disease (MASLD) and the progressed subtype, metabolic dysfunction-associated steatohepatitis (MASH), represent two common hepatic manifestations of obesity, presenting as dysfunctional metabolism, hepatic steatosis, insulin resistance, visceral adiposity, hyperlipidaemia, and hypertension. It is hypothesised that chronic low-grade inflammation and gut microbiome dysbiosis play vital roles in the pathogenesis of MASLD and progression to MASH. This research aims to phenotype the immunological, metabolic, and gut microbiome phenotype associated with MASLD/MASH and determine if transplantation of gut microbiomes via FMT from individuals with MASLD or MASH is sufficient to induce a MASLD/MASH phenotype in the mice.

METHODS
Individuals with MASLD (n=20) and MASH (n=16) were recruited for metabolic and inflammatory phenotyping and provided stool samples for microbiome analysis. Innate immune training (IIT) and whole blood stimulation (WBS) assays were carried out to analyse inflammatory responses. Dysbiotic MASLD and MASH gut microbiomes were transplanted via FMT into antibiotic-cleansed recipient mice which were fed HFD or SFD for 8 weeks. Fasting glucose and insulin were measured and 16S rRNA sequencing was carried out to phenotype the gut microbiomes of MASLD/MASH individuals and the recipient mice.

RESULTS
Despite no differences in fasting/postprandial insulin/glucose levels between MASLD/MASH individuals, IIT assays revealed a correlation between capacity to undergo IIT and liver stiffness score, indicating that MASH individuals were less likely to mount a sufficient IIT response, and MASLD individuals were more likely ($p=0.0411$). The IIT and WSB responses were highly heterogenous. Decreases in MASH vs MASLD IL-1β concentrations measured from viral-stimulated WBS reinforces the observed overall decrease in inflammatory responses in MASH vs MASLD ($p=0.0483$). There was reduced glucose tolerance in the MASH HFD mice vs MASLD HFD mice ($p<0.05$). There was an increase in fasting insulin and HOMA-IR in the MASH recipient mice vs MASLD recipient mice ($p<0.01$).

CONCLUSIONS
These RESULTS highlight differences in MASLD and MASH inflammatory profiles and reveal that transplantation of the gut microbiome alone is sufficient to induce phenotypic differences in the MASLD/MASH recipient mice. Current work is focusing on understanding the relationship between progression of disease and reduced inflammatory responses. Characterisation and exploration of the donor and mice recipient microbiomes is also ongoing.

CONFLICTS OF INTERESTS
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EPO7_036

EFFICACY OF PROBIOTIC-CONTAINING BUCCAL TABLETS ON HALITOSIS: AN IN VITRO AND IN VIVO STUDY

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BACKGROUND AND OBJECTIVES
Halitosis, recognized by an unpleasant odor emanating from the oral cavity, affects approximately 27.5% of individuals in China. Recently, probiotics have been investigated as an alternative treatment or prevention for halitosis, through modulation of oral microbiota, and inhibition of oral pathogens (e.g., *Fusobacterium nucleatum*). Evidence suggests that probiotics may alleviate bad breath within a short timeframe. Therefore, this study aimed to evaluate the inhibitory effect of specific probiotics (*L. helveticus* R0052, *L. rhamnosus* R0011 and *B. longum* R0175) on *F. nucleatum* ATCC25586 in vitro and to assess the impact of the probiotic-containing tablets on individuals with halitosis in vivo.

METHODS
The antimicrobial activity of the three selected probiotics was assessed based on their proportions in the tablet formulation. Biofilm formation was quantified using crystal violet staining. The effect of orally taken probiotics-containing tablets was investigated through a double-blind, placebo-controlled clinical trial involving 45 participants (aged 25-45 years) suffering from obvious bad breath (VSC＞150 ppb). Participants were randomly assigned into three groups, namely, control group (CG; placebo), low-dose group (LG; 3.3 billion CFU) and high-dose group (HG; 10 billion CFU). VSC levels were measured using OralChroma CHM-2 at baseline, 5 minutes (5 min) and 1 hour (1 h) after taking the tablets.

RESULTS
Co-culturing *F. nucleatum* ATCC25586 with the three probiotics resulted in a 97.47% reduction in the biofilm formation of *F. nucleatum* ATCC25586 ($p < 0.05$). In the clinical trial, both LG and HG exhibited significant decreases in VSC levels at both timepoints compared to baseline measurements ($p < 0.05$). In comparison to CG, the VSC level in HG decreased by 65.2% after 5 min ($p = 0.047$) and by 71.5% after 1 h ($p = 0.035$), while the reduction observed in LG was not statistically significant. This indicates that the efficacy of the probiotics-containing tablets in improving oral odor may be dose-dependent.

CONCLUSIONS
In summary, these findings suggest that the combination of *L. helveticus* R0052, *L. rhamnosus* R0011 and *B. longum* R0175 serves as an effective antimicrobial alternative against *F. nucleatum* ATCC25586. Furthermore, its breath-freshening effect on individuals with halitosis could persist for more than one hour following a single application.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_038

NUTRITIONAL INTERVENTIONS IMPROVE THE MENTAL HEALTH AND QUALITY OF LIFE OF HEAD AND NECK CANCER PATIENTS

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BACKGROUND AND OBJECTIVES
Patients with head and neck cancer often encounter challenges with nutrition, which can negatively impact their mental health and overall quality of life. Our systematic review and meta-analysis was conducted to evaluate the effects of nutritional interventions on mental health and quality of life in patients undergoing treatment for head and neck cancer.

METHODS
A comprehensive literature search was conducted using five electronic databases (PubMed, CINAHL, ProQuest, Medline, and Scopus) to identify all potentially relevant RCTs and Quasi-experimental studies published in English between 2018-2024. Two reviewers evaluated the titles and abstracts before the full-text review. The Joanna Briggs Institute's critical appraisal tool was used to appraise the quality of studies. Meta-analysis was conducted using CMA software ver 3.0. The I2 test was used to assess between-study heterogeneity, and Egger's test qualitatively evaluated the presence of publication bias.

RESULTS
Four articles met the inclusion criteria and were subsequently incorporated into the meta-analysis. The forest plots reported significant improvement in quality of life metrics (SMD = 0.862, 95%CI: 0.349, 1.376, P=0.001) and reduction in anxiety (SMD = -0.941, 95%CI: -1.342, -0.540, P=0.000) and depression (SMD = -0.747, 95%CI: -0.993, -0.501, P=0.000) compared to controls. Symmetry in funnel plots and p-value >0.05 in Egger's regression test negates the presence of publication bias.

CONCLUSIONS
Our findings underscore the significant benefits that nutritional support provides for the mental health and quality of life of head and neck cancer patients. They also stress the importance of incorporating dietary strategies into their comprehensive treatment regimens.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_039

SEX-DEPENDENT URINARY HIPPURIC ACID AS A BIOMARKER OF FRUIT AND NUTS INTAKE BASED ON THE EAT-LANCET INDEX

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BACKGROUND AND OBJECTIVES

Assessing nutrient intake is crucial for understanding body homeostasis and interpreting the relationship between diet and health outcomes (1). Nutritional balance measurement (inputs/outputs) have traditionally relied on dietary questionnaires and quality indices (2). However, these methods are limited by the subjective nature of the questionnaires and the variability inherent in food composition tables (3). Such methodological inconsistencies can be partially addressed by developing biochemical markers of nutritional intake (4), which provide an objective tool to link dietary consumption with urinary metabolite excretions (5). In this context, hippuric acid has been associated with the intake of certain vegetable foods and products (6). The aim of this study is to evaluate the validity of determining hippuric acid excretion as a biomarker for fruit and nut consumption and to explore the potential influence of sex on these relationships.

METHODS

An NMR analysis was performed to study targeted metabolites (n=34) in urine samples from 138 participants (69,7% F), concerning the Dietary Deal project (ref. AC21/00038). Urinary metabolite concentrations were categorized based on median adherence to the EAT-Lancet index (7) through medians (≤p50 or >p50), using a validated Food Frequency Questionnaire (FFQ) to assess energy and dietary intake (8). Hypothesis-based correlations were performed to identify associations between the metabolites and the 14 groups included in the EAT-Lancet index. Linear regression analyses were conducted to explore the relationship between urinary hippuric acid output and the consumption of fruits and nuts, once adjusted for demographic, as well as energy-related and appropriate food variables.

RESULTS

The use of the EAT-Lancet index, stratified by medians, allowed the discrimination between high and low dietary intake of fruits ($p=0.012$), nuts ($p<0.001$), poultry ($p<0.001$), and milk or dairy products ($p=0.010$) but no other foods. Sex appears to influence urinary concentrations of hippuric acid ($p=0.020$), with a mean higher concentration of 44,7% in females, as found in other investigations. Regarding hippuric acid concentrations, an association with FFQ nut estimated consumption is found for the first time ($p = 0.049$), along with a corroborated trend with fruit FFQ intake ($p = 0.057$).

CONCLUSIONS

Hippuric acid shows great potential as a dietary biomarker for nut and fruit intake in healthy populations, where sex should be accounted to assess food consumption.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_040

PHYSICAL CAPACITIES IN CONSTITUTIONAL THINNESS AND ANOREXIA NERVOSA ARE DIFFERENTIALLY ALTERED

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BACKGROUND AND OBJECTIVES

Physical capacities (PC) are linked to body weight and consequently body composition. Anorexia nervosa (AN) and constitutional thinness (CT) are two distinct conditions characterized by low body weight with different body composition and muscle phenotype. Data suggest altered PC in AN, whereas scarce recent studies indicate similar PC in CT, with no direct comparison between the two thin populations. This study aims to fill this gap and compare PC in women with AN, CT and a normal-weight control group (CON).

METHODS

A total of 84 women were included: 29 with AN, 24 with CT, and 31 healthy normal-weight women as CON. Leg extension and handgrip strength measurements as well as cardiopulmonary exercise testing (CPET) were performed. Subjective fatigue was also evaluated using the FACIT-F questionnaire. Pulse wave velocity and baroreflex sensitivity were recorded before the CPET. Fatigability was also assessed through the QIF test in a subset of 7 AN, 6 CT and 15 CON.

RESULTS

Maximal voluntary force in upper and lower body were both significantly lower in AN and CT compared to CON. Fatigue was lower in CON (FACIT-F score: 45.1±2.7) than in AN (32.8±2.7; $p=0.0003$) and CT (29.8±3.1, $p<0.0001$). VO2peak, maximal aerobic power (MAP) and VO2 at the first and second ventilatory threshold were significantly lower in CT and AN than in CON. MAP was significantly higher in CT than in AN. Exhaled gas volume was significantly lower in AN than in CON. Maximal lactate concentration was found to be higher in AN than CT and CON and lower in CT than in CON. The number of stages performed during the QIF test was significantly lower in CT than in CON (6.3±1.5 vs. 7.9±1.1, $p<0.05$), but no differences were observed between the groups for other parameters of the QIF test.

CONCLUSIONS

This study highlights both lower aerobic and muscular capacities in both AN and CT, with greater impact in CT. If these alterations in AN may directly be linked to undernutrition, they might appear more linked to deconditioned and altered muscle phenotype in CT. Subjective fatigue assessments showed a higher self-reported fatigue for both AN and CT, contrasting with relatively normal objective RESULTS. These findings have clinical implications. In AN, physical condition should be evaluated to tailor and time the implementation of an adapted exercise program appropriately. In CT, further examination of the potential role of adapted physical training in improving muscular and aerobic capacity, reducing fatigue, enhancing well-being, and supporting weight and muscle mass gains is warranted in this population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_041

EXPLORING IRON DEFICIENCY IN PERNICIOUS ANAEMIA: A SURVEY OF DIAGNOSIS, TREATMENT AND MANAGEMENT PRACTICES

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BACKGROUND AND OBJECTIVES
Pernicious anaemia (PA) is an autoimmune condition characterised by vitamin B12 deficiency due to the destruction of gastric parietal cells and subsequent loss of intrinsic factor [1]. Iron deficiency (ID) is commonly observed in PA and can present as ID with or without anaemia, single-occurrence ID, or recurrent ID, all of which pose unique management challenges. Despite its prevalence, formal guidelines for screening or managing ID in PA patients are lacking [2–4]. To address these gaps, this study investigates the diagnosis, management, and screening of ID among PA patients, with or without anaemia.

METHODS
An online survey was developed using Qualtrics and distributed to approximately 2068 members of the Pernicious Anaemia Society (PAS) to collect data on demographic characteristics, medical history, ID diagnosis and treatment, monitoring practices and symptoms. Ethical governance approval was provided by the University of Surrey's Research Innovation & Impact Office (EGA ref: 0499). Participant responses were anonymised and analysed descriptively using R software (2024.09.1+394).

RESULTS
Data collection is ongoing, but interim analysis was conducted for 202 participants (n=159 (79%) female; mean age 61, range: 24-91 years). Among respondents, n=119 (59%) reported experiencing ID, 61 experienced this both before AND after their PA diagnosis, while n=27 and n=31 reported ID occurring only before or after, respectively. Among those reporting recurring ID (n=74), n=30 (41%) indicated their ID was not well-managed. Iron tablets were the most common first-line treatment for those with iron deficiency n=81 (71%), followed by iron infusions n=10 (9%). Improvements in iron levels were reported by n=67 (59%), while n=37 (33%) had no follow-up blood tests. Symptom improvement following treatment was reported by n=64 (58%). Monitoring for ID was infrequent, with nearly 80% of participants (n=142) reporting no monitoring. Finally, n=49 (43%) of participants could not differentiate symptoms of iron deficiency from those of PA.

CONCLUSIONS
Iron deficiency among PA patients is often recurrent, poorly managed, and infrequently monitored, with variable treatment outcomes and insufficient follow-up. These findings highlight the need for clinical guidelines to address gaps in monitoring and treatment, considering the unique aetiology of ID and potentially overlapping symptoms in this population. Such efforts could enhance the diagnosis, monitoring, and management of PA-associated iron deficiency, ultimately improving outcomes and quality of life for patients.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_042

CONNECTIONS BETWEEN WAIST CIRCUMFERENCE, METABOLIC MARKERS, AND GUT MICROBIOTA DIVERSITY DEPENDING OF THE OBESITY PHENOTYPE

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BACKGROUND AND OBJECTIVES

Obesity and excessive adiposity have been associated with microbiota dysbiosis as well as with metabolic and homeostatic dysregulations (1). Some obesity phenotypes (e,g, Android vs Gynoid shapes) as well as sex have been related with different cardiometabolic risks rates (2), but the influence of the body fat morphological distribution has been scarcely investigated concerning interactions with microbiota abundance and taxonomic diversity. This study aims to analyze the relationship between waist circumference (WC), metabolic markers, and gut microbiota in women categorized by phenotypes based on fat accumulation according to the waist perimeter.

METHODS

A cross-sectional study was conducted including women (n=219) stratified in two groups based on the median WC (97 cm). Anthropometric measurements, body composition, and relevant metabolic markers were evaluated (3). Gut microbiota analyses based on 16S rRNA sequencing were studied employing hypothesis-driven statistical models. Beta diversity was assessed using PERMANOVA test (4).

RESULTS

Participants with high WC (>97 cm) exhibited higher body mass index (32.7 kg/m² vs. 24.5 kg/m², $p<0.001$), body fat percentage (43.4% vs. 32.5%, $p<0.001$), and visceral fat (11.0% vs. 6.5%, $p<0.001$), compared to the low WC group, respectively. Metabolic markers also differed significantly, with higher HOMA-IR (2.5 vs. 1.4, $p<0.001$), triglycerides (109.5 mg/dL vs. 80.0 mg/dL, $p<0.001$), and CRP (3.0 mg/L vs. 1.0 mg/L, $p<0.001$) in the high WC group. Fecal microbiota beta diversity evidenced statistically significant differences between both groups ($p=0.031$). *Prevotella* and *Bacteroides* showed discriminative opposite trends depending on the two analyzed fat distribution phenotypes.

CONCLUSIONS

This study highlights the significant associations between waist circumference (WC), metabolic markers, and gut microbiota composition in women. Findings reveal that individuals with the higher WC phenotype exhibit distinct metabolic outcomes, altered gut microbiota diversity, and specific bacterial profiles (e.g., *Prevotella* and *Bacteroides*) linked to fat distribution phenotypes. These RESULTS underscore the interplay between adiposity patterns and microbiota, offering newer insights into obesity-related health risks for precision nutrition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_043

NUTRITIONAL STATUS IS ASSOCIATED WITH PHYSICAL AND COGNITIVE PERFORMANCE OF OLDER ADULTS: A CROSS-SECTIONAL ANALYSIS OF THE CAPACITY OF OLDER INDIVIDUALS AFTER NUT SUPPLEMENTATION (COINS) TRIAL

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BACKGROUND AND OBJECTIVES
Nutritional status is associated with both physical and cognitive performance in older adults. The Mini Nutrition Assessment (MNA) is a validated tool to assess older adults' nutritional status. This study aimed to investigate whether MNA scores are associated with physical and cognitive performance of community-dwelling older adults.

METHODS
This is a cross-sectional analysis of baseline data from the Capacity of Older Individuals after Nut Supplementation (COINS) randomised, controlled trial (ACTRN 12622001291774) that included adults aged ≥65 years and at-risk for falls. Participants were screened for malnutrition risk using MNA, consisting of i) MNA-Screening (range 0-14; at-risk/ malnourished if <11), and ii) MNA-Assessment (range 0-16, no cut-offs) components, with both MNA screening and assessment scores summed to iii) MNA-Total (range 0-30; at-risk/malnourished if <23.5). Appendicular lean mass (ALM) was measured using dual-energy x-ray absorptiometry. Physical performance (muscle strength, gait speed, balance and muscle power), was objectively measured using standard tests. Global cognitive performance was measured using the validated Montreal Cognitive Assessment (MoCA, range 0-30). Linear regression analyses were performed with age and sex as covariates.

RESULTS
120 participants were included (70% females, age=74.8±4.5y) in the analysis. MNA-Screening, MNA-Assessment and MNA-Total scores were (median [IQR]) 14 [12.0-14.0], 14 [13.5-15.0] and 27.5 [26.0-28.4] respectively. Malnutrition was found in 18 (15.0%) and 8 (6.7%) participants based on MNA-Screening and MNA-Total. Higher MNA-Screening scores were associated with higher ALM [β=1.28 (SE 0.45), p=0.006] and knee extension strength [β=1.36 (SE 0.65), p=0.039]. Higher MNA-Assessment scores were associated with faster gait speed [β=0.04 (SE 0.01), p=0.007], shorter timed up-and-go time [β=-0.19 (SE 0.09), p=0.035], and better MoCA scores [β=0.65 (SE 0.20), p=0.001]. Higher MNA-Total scores were also associated with higher ALM [β=0.80 (SE 0.33), p=0.018]. Malnutrition risk status, determined by MNA-Screening (but not MNA-Total), was associated with lower ALM [β=-3.98 (SE 1.19), p=0.001], but not strength, physical or cognitive performance.

CONCLUSIONS
In community-dwelling older adults, MNA-Screening scores were associated with muscle mass and strength, whereas the MNA-Assessment scores were associated with physical and cognitive performance. The differential associations found with various MNA component scores may be explained by the distinctive aspects of malnutrition risks they assessed.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_045

MICROBIOTA-DIRECTED COMPLEMENTARY FOOD IMPROVES LINEAR GROWTH IN CHILDREN RECOVERING FROM SEVERE ACUTE MALNUTRITION

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BACKGROUND AND OBJECTIVES

Globally, stunting affects ~150 million children under five, while wasting affects nearly 50 million. Severe acute malnutrition (SAM) is a major global health problem affecting 19 million children under five. There is limited knowledge regarding the children who were diagnosed with SAM, underwent therapeutic dietary intervention, were discharged as cured,and presented any outcome when followed for a longer period.

METHODS

Following treatment for SAM, we enrolled 124 children aged 12–18 months with moderate acute malnutrition (MAM). In a previously reported RCT, we observed a significant improvement in weight gain among these children who received microbiota-directed complementary food (MDCF) as dietary supplementation after three months of intervention. We monitored these children for two years following the intervention, measuring their weight-for-length, weight-for-age, and length-for-age z-scores every six months.

RESULTS

Children who received MDCF demonstrated significantly higher LAZ scores over time during follow-up compared to those who received ready-to-use supplementary food [linear mixed-effects model: b (95% CI) for MDCF X Month = 0.006 (0.003, 0.009); P < 0.001].

CONCLUSIONS

MDCF treatment of Bangladeshi children with post-SAM MAM produced significant improvements during intervention and reduced stunting during follow-up. These RESULTS indicate the effectiveness of supplementary foods for undernourished children and the sustainability of growth during the follow-up period. We suggest conducting prospective cohort studies with longer intervention periods to observe nutritional outcomes in these vulnerable child groups.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_047

DYNAMIC CHANGES IN NUTRITIONAL AND SKELETAL MUSCLE INDICES AS PREDICTORS OF 5-YEAR SURVIVAL IN LIVER TRANSPLANT RECIPIENTS

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BACKGROUND AND OBJECTIVES
Nutritional status and muscle mass changes affect liver transplant outcomes. This study examined the prognostic value of changes in prognostic nutritional index (ΔPNI) and psoas muscle index (ΔPMI) on survival and mortality in liver transplant patients.

METHODS
A retrospective cohort study of 124 patients analyzed ΔPNI, ΔPMI, survival days, and mortality using Pearson correlation, logistic regression, and Kaplan-Meier survival analysis.

RESULTS
ΔPNI and ΔPMI significantly predicted mortality (ΔPNI: Exp(B) = 0.932, p = 0.006; ΔPMI: Exp(B) = 0.453, p = 0.002). A weak positive correlation was found between ΔPNI and ΔPMI (r = 0.253, p = 0.005).

CONCLUSIONS
Post-transplant changes in PNI and PMI are critical predictors of survival, emphasizing the need for targeted nutritional and rehabilitative interventions to improve outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_048

ANALYSIS OF FACTORS INFLUENCING PRE-DIABETES IN RURAL CHINA AND EVALUATION OF INTERVENTION EFFECTS

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BACKGROUND AND OBJECTIVES
Pre-diabetes mellitus (PDM) is an inevitable stage in the development of DM, and it is also one of the high-risk factors of DM. This study intends to investigate the prevalence of PDM in rural middle-aged and elderly people, analyze its influence factors. At the same time, as to find potential biomarkers that can reflect blood glucose levels and be used for subsequent intervention effect analysis.

METHODS
A total of 4,158 eligible residents were recruited. The significant factors were screened by single factor analysis, and then the independent influence factors of PDM were studied by multifactorial logistic regression. 30 patients with normal blood glucose, 30 people with PDM and 30 people with DM were selected to form the control group, PDM group and DM group. Differential metabolites and key metabolic pathways were screened by principal component analysis, orthogonal partial least squares discriminant analysis, topological analysis of metabolic pathways and enrichment analysis. The intervention time was 3 months. Questionnaire survey, physical examination and biochemical test were conducted before and after the intervention. In addition, the levels of potential biomarkers in each group were detected after the intervention.

RESULTS
The detection rate of PDM in rural middle-aged and elderly population in Huai'an City, Jiangsu Province was 23.91%.The metabolites from normal blood glucose individuals to PDM and then to DM change with the change of fasting blood glucose and glycosylated hemoglobin, mainly involving amino acids and their derivatives, fatty acids and their derivatives, carbohydrates, organic acids and their derivatives. In addition, 1,5-anhydroglucitol can be used as a potential biomarker to reflect blood glucose levels. The occurrence of PDM and DM may be related to alanine, aspartic acid and glutamic acid metabolism, taurine and hypotaurine metabolism, glycine, serine etc.Three intervention programs can prevent or delay the occurrence and development of DM to a certain extent. Among them, the intervention program of diet combined with exercise has the best effect, followed by the effect of simple diet intervention, and finally the exercise intervention. It is necessary to pay attention to the dietary structure of rural PDM population with crop planting as the main means of survival and provide dietary guidance to prevent or delay the development of PDM into DM.

CONCLUSIONS
The RESULTS of this study show that the prevalence of PDM in rural middle-aged and elderly people living in Huaian City, Jiangsu Province for a long time is high.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_050

DIETARY MODULATION FOR THE HYPERTENSION RISK GROUP IN KOREANS: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
Hypertension (HTN) is a critical global health issue, contributing to high morbidity and mortality rates. Representative risk factors for HTN include aging, genetics, obesity, alcohol drinking, smoking, and diet. Dietary interventions like the Dietary Approaches to Stop HTN (DASH) diet plan are effective in preventing and managing HTN. We intend to comprehend the influence of eating patterns on HTN applying multiple risk factors.

METHODS
Among the Korean Cancer Prevention Study-II subjects, those who responded to the dietary questionnaire were included in this study. Individuals were grouped into four groups: optimal (*n*=7,712), normal (*n*=1,220), high normal (*n*=3,655), and HTN (*n*=4,355) according to the 2022 HTN treatment guidelines of Korea. Factor analysis was performed to identify major dietary patterns based on nutritional data obtained from a brief dietary questionnaire, including 17 food items. Finally, we conducted a moderation effect analysis to evaluate the contribution of these dietary patterns on the HTN risk score calculated by genetic variables, body mass index, alcohol consumption, and smoking status.

RESULTS
Three principal dietary patterns (Korean, Western, and New diets) were detected. Those foods placed high on the factor loading on the Korean diet pattern include grain, mixed protein sources, vegetables, and Kimchi. The Western diet pattern is centered on sugar, eggs, and oil, whereas the New diet pattern is defined by a high consumption of fruits and dairy products and a low sugar intake. In a moderation effect analysis, the Korean diet showed no significant effect on HTN risk in the HTN high-risk population, whereas the Western diet prevented HTN risk. The New diet presented a beneficial effect with a statistical significance borderline.

CONCLUSIONS
The nutritional moderation effect was proven in the HTN risk group, defined by various risk factors, including heredity, obesity, alcohol consumption, and smoking status. If the findings are validated by longitudinal investigation, our findings could serve as the basis for developing dietary guidelines for HTN.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_051

CITRUS POLYPHENOLS POTENTIATE ANTI-OBESITY EFFECT OF GREEN TEA

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BACKGROUND AND OBJECTIVES
Green tea, a widely consumed beverage in Asia, contains green tea polyphenols effective against obesity, especially epigallocatechin-3-O-gallate (EGCG), but must be consumed in an impractically huge amount daily to elicit its biological effect. Metabolic profiling-based data mining showed that eriodictyol, a type of citrus polyphenol, enhances the anticancer effect of green tea polyphenol EGCG 1). This study aimed to evaluate the anti-obesity effect of a combination of EGCG or green tea and citrus polyphenols.

METHODS
C57BL/6J mice were fed a normal diet, high-fat and high-sucrose diet (HF/HS), HF/HS with green tea extract diet, HF/HS with eriodictyol diet, or HF/HS with green tea extract and eriodictyol diet. In a randomized, placebo-controlled, double-blinded, and parallel-group-designed clinical trial, 60 healthy Japanese males and females aged 30–75 years consumed green tea combined with α-glucosyl hesperidin, a type of citrus polyphenol at doses that have not been previously reported to exert anti-obesity effects by themselves in any clinical trial for 12 weeks.

RESULTS
In mice fed with high-fat/high-sucrose diet, green tea and eriodictyol combination prevented weight gain. At week 12, green tea combined with α-glucosyl hesperidin prevented weight gain and reduced body mass index (BMI) compared with the placebo. Especially in those aged < 50 years, triglyceride and body fat percentage decreased at week 6, visceral fat level and body fat percentage decreased at week 12; body weight, BMI, and blood LDL/HDL ratio also decreased.

CONCLUSIONS
Taking green tea combined with α-glucosyl hesperidin prevents weight gain, and the anti-obesity effect of green tea combined with α-glucosyl hesperidin was more pronounced in people aged < 50 years.

CONFLICTS OF INTERESTS
Hirofumi Tachibana was supported in part by TOYOTA MOTOR CORPORATION.Motofumi Kumazoe do not have any competing interest.Ren Yoshitomi do not have any competing interest.Yoshinnori Fujimura do not have any competing interest.

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EPO7_054

FROM POLYGENIC RISK TO DIETARY BALANCE: EXPLORING FAT INTAKE AND DEMENTIA RISK

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BACKGROUND AND OBJECTIVES

The relationship between dietary fat intake and dementia remains controversial, and the influence of genetic risk profiles on this association is poorly understood. This study examines the interactions between genetic factors related to fat intake, disease susceptibility, and various types of dietary fats in influencing the risk of all-cause dementia.

METHODS

This study analyzed 97,765 adults of European ancestry from the UK Biobank. Participants without cognitive impairment or dementia at baseline (2006–2010) who completed at least two dietary assessments were included in the study and followed until 2022. Dietary fat intake, including specific fatty acids, total cholesterol, and fats from vegetable and animal sources, was evaluated using 24-hour dietary recalls conducted from 2009 to 2012. A polygenic risk score (PRS) based on 12 single nucleotide polymorphisms was used to assess genetic variability in fat intake. PRS for dementia and *APOE* genotype (ε2 and ε4 status) were also calculated to evaluate disease predisposition. Associations between dietary fat intake and incident dementia were analyzed using multivariable-adjusted Cox proportional hazards models in the overall sample and subgroups defined by genetic variation.

RESULTS

During a median follow-up of 10.5 years, 985 cases (97.3/100,000 person-years) of all-cause dementia were identified. Non-linear associations were observed for various dietary fats. Total fat, total cholesterol, monounsaturated fatty acids, vegetable fat intake, and the vegetable-to-total fat ratio exhibited U-shaped relationships with dementia risk. Conversely, n-3 and n-6 polyunsaturated fatty acids showed L-shaped associations, with optimal intake thresholds of 1.43 g/day and 9.51 g/day, respectively. The association between cholesterol intake and dementia was stronger in participants with moderate-to-high PRS for fat intake (*P* for interaction=0.024). Similarly, the relationship between the vegetable-to-animal fat ratio and dementia risk was more pronounced in non-*APOE* carriers (*P* for interaction=0.035).

CONCLUSIONS

Dietary fat quantity and composition significantly influence dementia risk. Moderate fat consumption and a balanced intake of fats from animal and vegetable sources may provide protective effects. Personalized dietary recommendations, tailored to individual genetic backgrounds, are crucial for dementia prevention, particularly regarding cholesterol intake and the vegetable-to-total fat ratio.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_055

RISK OF MALNUTRITION IS ASSOCIATED WITH LOWER HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH CHRONIC KIDNEY DISEASE TREATED WITH HEMODIALYSIS

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BACKGROUND AND OBJECTIVES

Malnutrition is a common complication in chronic diseases, such as chronic kidney disease (CKD), and is linked to poorer survival rates and reduced health-related quality of life (HRQoL). The aim was to investigate the association between risk of malnutrition and physical HRQoL in patients with CKD treated with hemodialysis.

METHODS

A cross-sectional study was conducted at a university hospital in Sweden, and patients with CKD (age ≥18 years) treated with hemodialysis (duration >3 months) were recruited in August-September of 2024. Risk of malnutrition was assessed as part of clinical routine, using the Scored Patient-Generated Subjective Global Assessment Short Form (PG-SGA SF). This instrument includes scoring of items related to body weight, food intake, nutrition impact symptoms (NIS), and activity and function as self-reported by the patient. Cut-off score for risk of malnutrition was set at ≥4 points. HRQoL was measured with RAND-36, a 36-item instrument that assesses eight health concepts including both physical and mental health. Of the RAND-36, the physical HRQoL concepts energy/fatigue, physical functioning and role limitations due to physical health were assessed. Higher scores for the concepts (0-100) indicate better perceived health. Demographic and medical data were collected from the Swedish Renal Registry. The Mann-Whitney U-test was used to test for differences in HRQoL between those with or without risk of malnutrition.

RESULTS

In total, 69 of 74 eligible patients gave their written consent to participate, i.e., 43 men and 26 women. Mean age was 66.6 ±14.6 years and 25 patients (missing n=9) had diabetes. Mean time on dialysis was 48.9 months (min 3.7, max 198.8) and 30 patients (missing n=6) had risk for malnutrition. In total, 52 patients responded to both RAND-36 and PG-SGA SF. In patients with risk of malnutrition, all HRQoL concepts related to physical health were significantly lower; energy/fatigue (median HRQoL score 40 vs. 55, *p=0.003*), physical functioning (median HRQoL score 25 vs. 55, *p=0.020*), role limitations due to physical health (median HRQoL score 0 vs. 50, *p=0.002*).

CONCLUSIONS

In patients with CKD treated with hemodialysis, HRQoL concepts related to physical health are impaired in patients with risk of malnutrition. Finding patients at risk of malnutrition in time is of utmost importance, so that nutritional interventions can be timely initiated, with the aim to prevent low physical HRQoL.

CONFLICTS OF INTERESTS

H. Jager-Wittenaar was co-developer of the PG-SGA-based Pt-Global web tool.

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EPO7_056

PROFILING URINARY POLYPHENOL METABOLITES: FINGERPRINTS OF THE MEDITERRANEAN DIET AND ITS COMPONENTS

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BACKGROUND AND OBJECTIVES

Polyphenols are bioactive compounds present in plants, recognized for their potential protective effects against chronic diseases. However, dietary polyphenols undergo extensive metabolism, during digestion in the small intestine and later in the the gut, where the microbiota generates news compounds that may have distinct biological activities (Del Rio et al., 2013). This study aimed to profile a broad panel of urinary phenolic compounds derived from dietary polyphenols and explore their associations with adherence to the Mediterranean diet (MedDiet), as well as with its individual components.

METHODS

Data from a nested case-cohort study within the PREDIMED trial involving 1,180 participants was used for this study. A state-of-the-art methodology capable of detecting 150 urinary phenolic compounds using quadrupole time-of-flight liquid chromatography-tandem mass spectrometry was employed. Adherence to the MedDiet was assessed using the validated Mediterranean Diet Adherence Screener (MEDAS) questionnaire (Schröder et al., 2011). Correlations between individual standardized metabolites with the MEDAS score, as well as with each food component, were performed using Pearson correlation coefficient (ρ).

RESULTS

A total of 65 phenolic metabolites were identified and quantified in urine, primarily comprising phase-2 and microbial metabolites of dietary polyphenols. Most metabolites showed positive correlations with overall MedDiet adherence as assessed by MEDAS. When analyzing individual items included in the MEDAS, metabolites exhibited the strongest positive associations with consumption of fruits, wine and nuts. Specifically, fruit intake correlated with flavonoids and phenolic acids derived from them ($\rho > 0.1$) (Neveu et al., 2010). Wine consumption was associated with stilbene-derived metabolites ($\rho > 0.3$), such as resveratrol, and tyrosol derivatives ($\rho > 0.09$) (Neveu et al., 2010). Nuts intake showed correlations with urolithins and their phase-2 metabolites, originating from dietary ellagitannins ($\rho > 0.15$) (Garcia-Villalba et al., 2022).

CONCLUSIONS

This study identified a diverse panel of urinary phenolic metabolites linked to dietary polyphenols and their associations with MedDiet adherence and specific food components. These findings pave the way for the development of a novel urinary fingerprint to assess intake of specific foods and their role in diet-related health outcomes.

CONFLICTS OF INTERESTS

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EPO7_057

THE EFFECT OF DIETARY FIBER INTAKE ON NUTRITION IN HEMODIALYSIS PATIENTS

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BACKGROUND AND OBJECTIVES
Dietary fiber intake is often lower in hemodialysis (HD) patients, because of decreased intake of fruits and vegetables for restricted dietary potassium. The objectives of the study was to investigate the effect of dietary fiber intake on nutrition in our HD population.

METHODS
We include 102 HD patients, mean age 61.8± 12.4 years old, we assessment fiber intake, subjective global nutritional assessment (SGA), macronutrients, anthropometry. Mean dietary fiber intake is 11.9 g ± 2.7 g/day, all patients were divided dietary fiber intake <=11.0 g/day (low fiber group) and dietary fiber intake > 11.0 g/day (high fiber group).

RESULTS
Lower dry weight (58.4 ±10.9 vs 64.1 ±15.1 kg, $P < 0.005$) and BMI (22.3 ± 3.6 vs 24.8 ± 4.9 kg, $P < 0.005$) in the higher fiber group than low fiber group. In SGA, high fiber group had significantly higher score than low fiber group in appetite score (6.1 ± 0.8 vs 5.5 ± 1.3 score, $P < 0.01$) , GI function score (6.1 ± 0.8 vs 5.5 ± 1.3 score, $P < 0.05$) , metabolic stress score (5.6 ± 0.8 vs 5.1 ± 1.0 score, $P < 0.05$) , total score (5.7± 0.6 vs 5.2 ± 0.9 score, $P < 0.005$). Total daily energy (1849 ± 332 vs 1558 ± 320 kcal/day, $P < 0.0001$ and 32.1 ± 5.1 vs 27.5 ± 5.4 kcal/ IBW kg, $P < 0.0001$), protein (1.3 ± 0.2 vs 1.1 ± 0.2 g/IBW Kg, $P < 0.001$), and carbohydrate (228.4 ± 53.2 vs 190.2 ± 37.1 Kcal/day, $P < 0.05$) in high fiber group had significantly higher than low fiber group. In anthropometry, high fiber group had significantly lower than low fiber group as mid-arm circumference (MAC) (26.3 ± 3.3 vs 28.1 ± 3.7 cm, $P < 0.05$) and triceps skinfold thickness (TS F) (18.2 ± 10.2 vs 24.1 ± 11.8 mm, $P < 0.05$), but in muscle strength, HGS and PS had higher in the higher fiber group than low fiber groups, but there were no significantly difference.

CONCLUSIONS
Higher dietary fiber intake in HD patients had good nutritional status, higher energy and protein intake, and lower body fat. In clinical practice, we suggested HD patients to intake more dietary fiber.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_058

UNVEILING SEX DIFFERENCES: HOW TRADITIONAL CALORIC RESTRICTION OR TIME-RESTRICTED EATING IMPACT EMOTIONAL EATING IN ADULTS WITH FATTY LIVER DISEASE

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BACKGROUND AND OBJECTIVES
The Emotional Eating Questionnaire (EEC) assesses the relationship between emotions and eating habits, particularly in response to emotions like stress or anxiety. ECC RESULTS can affect parameters such as physical activity and total energy intake. Differences in body composition and physical activity between sexes may influence intervention outcomes, making sex-based segmentation crucial for improving accuracy and relevance in nutritional studies. This study evaluates the impact of traditional caloric restriction and time-restricted eating on emotional eating in male and female adults with fatty liver disease.

METHODS
We aim to recruit 177 participants, aged 50-70 years, with a BMI of 25-40 kg/m² and incipient fatty liver disease assessed by the FLI index. Participants are randomly allocated into three groups: control group (CG) following an unrestricted Mediterranean diet (MedD), CR group (25% energy-reduced MedD), and TRE group (14-hour daily fasting). The six-month intervention includes assessments at 0, 3, and 6 months for BMI, visceral fat index, waist circumference, fat mass %, and lean mass. Emotions impact on eating behaviour was evaluated using the CCE questionnaire, and group differences in CCE changes were analysed with ANCOVA adjusted for age and sex. Linear regression examined baseline CCE scores relationship with changes in weight and body composition, adjusted by age and sex.

RESULTS
Both TRE and RC groups increased the CCE score, although this increase was greater and significant only in RC group. TRE showed a decrease in the CCE score in comparison with RC group. The sex segregation analyses showed that men decreased the CCE score in both intervention arms, but this decrease was significant only in TRE group. However, women increased CCE score in both groups, although only the increase in RC group was significant. A higher baseline CCE was associated with an increase in muscle mass, BMI and physical activity in men.

CONCLUSIONS
TRE improves the impact of emotions on eating behaviour more in men, while it worsens the impact of emotions on eating behaviour less in women to traditional calorie restriction. In men, high emotional components are linked to greater motivation for physical activity and increased muscle mass. These findings highlight the need for further research on the intersex variable in the emotional modulation of nutritional outcomes, a critical factor for designing targeted interventions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_059

POTENTIAL BIOMARKERS FOR SARCOPENIA BASED ON METABOLISM, STEROID HORMONE AND INFLAMMATION

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BACKGROUND AND OBJECTIVES

Sarcopenia, a prevalent condition affecting 10-27% of older adults [1], is linked to various biological processes such as metabolism, hormone regulation, and inflammation [2]. Easily measurable biomarkers that provide early and precise assessment of sarcopenia are crucial but remain inadequate [3-5]. This study aimed to identify potential biomarkers for sarcopenia based on these mechanisms and to assess their impact on muscle-related parameters.

METHODS

Serum samples were collected from 44 individuals aged 65 and older, divided into a sarcopenia group and an age-matched control group. These samples were analyzed for metabolic profiles, steroid hormone levels, and inflammation markers. Using t-tests and the OPLS-DA analysis, we identified biomarkers that significantly differed between the two groups. After adjusting for confounding factors, such as gender, age, and lifestyle, we examined the association between these biomarkers and muscle-related parameters through multiple linear regression.

RESULTS

Our RESULTS revealed that individuals with sarcopenia had notably different levels of cortexolone, dehydroepiandrosterone (DHEA), IL-6, and 74 metabolites primarily related to lipid and lipoprotein metabolism, amino acids, and fatty acids. Specifically, creatine levels were negatively correlated with skeletal muscle mass index (SMI) (β=-0.01, P=0.038) and grip strength (β=-0.20, P=0.004), while DHEA levels were positively correlated with both SMI (β=0.08, P=0.032) and grip strength (β=0.81, P=0.034). Additionally, Fructose (β=-0.22, P=0.049) and DPA (β=-0.37, P=0.043) levels were negatively associated with SMI, meanwhile methylmalonyl-carnitine levels showed a positive correlation with grip strength (β=4.51, P=0.009).

CONCLUSIONS

Several biomarkers related to metabolism, steroid hormones, and inflammation were identified and validated as being associated with sarcopenia-related parameters. These findings suggest potential biomarkers for early detection and intervention, though further validation is needed.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_060

EFFICACY OF TIME-RESTRICTED EATING IN IMPROVING BODY COMPOSITION COMPARED TO TRADITIONAL CALORIE RESTRICTION: A RANDOMIZED CLINICAL TRIAL

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BACKGROUND AND OBJECTIVES

Intermittent fasting is emerging as an effective intervention to improve cardiovascular risk parameters. However, the RESULTS are contradictory. This study evaluates the effects of three dietary approaches: Mediterranean diet, caloric restriction (CR), and time-restricted eating (TRE), on anthropometric measures, including body composition.

METHODS

We aim to recruit 177 participants, men and women 50-70 years old with BMI-25-40 Kg/m2 and incipient fatty liver disease assessed by the FLI index. Participants are randomly allocated into three groups: control group (CG) following an unrestricted Mediterranean diet (MedD), CR group (25% energy-reduced MedD) , and TRE group (14 hour of daily fasting). The intervention lasts six months, with anthropometric and body composition assessments at 0, 3 and 6 months. Measured outcomes included body mass index (BMI), visceral fat index, waist circumference, fat mass percentage, and lean mass (kg). Body composition was evaluated with a Tanita scale and dual-energy X-ray absorptiometry (DEXA). Changes over time were analyzed using mixed linear models with time, age, and sex as fixed effects and participant as a random effect. The agreement between Tanita and DEXA was assessed.

RESULTS

All groups showed significant reductions in waist circumference. Visceral fat index improved significantly in the CR and TRE groups. BMI improved significantly in the TRE group. Fat mass significantly decreased in the CR and TRE groups, while lean mass remained unchanged with DEXA in all groups. Tanita measures indicated a significant lean mass decrease in the CR group. Notably, Tanita underestimated fat mass and overestimated lean mass compared to DEXA.

CONCLUSIONS

Preliminary RESULTS suggest that TRE improves body composition parameters more than CR without compromising lean mass. Discrepancies between Tanita and DEXA highlight the importance of measurement method selection in assessing body composition.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_061

COMPARISON OF CT AND BIA IN THE ASSESSMENT OF BODY COMPOSITION IN ELDERLY PATIENTS WITH SARCOPENIA

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BACKGROUND AND OBJECTIVES
Sarcopenia is defined as a syndrome with decline in muscle mass and strength associated with functional decline. Accurate methods for assessing body composition in elderly patients with sarcopenia are essential to determine muscle condition as well as monitor therapeutic interventions. The purpose of our study was to compare the accuracy of measurements of body composition made using analysis of computed tomography (CT) scans at the L3 vertebral level, and bioelectrical impedance analysis (BIA).

METHODS
The diagnosis of sarcopenia were based on the definition of primary sarcopenia produced by the Asian Working Group for Sarcopenia (AWGS). CT and BIA were performed in 34 patients recruited from a clinical trial investigating age-related sarcopenia with no more than seven days apart. CT image slices at the third lumbar vertebrae (L3) level were analyzed using SliceOmatic V4.2 software (Tomovision, Montreal, Canada) to calculate the surface area of the muscle tissue and adipose tissue.

RESULTS
Our RESULTS show strong correlations between fat-free mass on CT and BIA ($r=0.8696, P<0.0001$) and fat mass on CT and BIA ($r=0.9255, P<0.0001$). On Bland–Altman analysis, two methods showed ideal consistency. Average bias for fat-free mass on CT and BIA was -4.3289 with 95% limits of agreement (LOA) of –10.0020 to 1.3443. For fat mass on CT and BIA, average bias was 2.8717, with LOA of –1.8720 to 7.6155.

CONCLUSIONS
Our study showed that BIA underestimated fat mass and overestimated fat-free mass compared with CT when assessing sarcopenia. If patients with sarcopenia are overestimated by using the BIA method to assess muscle mass, appropriate treatments including nutritional and exercise interventions may be delayed and may affect prognosis.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_063

DISTINCT POSTPRANDIAL METABOLIC AND INFLAMMATORY RESPONSES IN HEALTHY INDIVIDUALS VS PATIENTS WITH METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE AND METABOLIC DYSFUNCTION-ASSOCIATED STEATOHEPATITIS

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BACKGROUND AND OBJECTIVES
Metabolic dysfunction-associated steatotic liver disease (MASLD) is a spectrum of conditions from simple steatosis to metabolic dysfunction-associated steatohepatitis (MASH), characterized by inflammation and fibrosis. Low-grade systemic inflammation, possibly driven by crosstalk between immune and metabolic pathways, may play a crucial role in the progression to MASH, wherein dietary responses and/or microbiome metabolites may contribute to this inflammatory-fibrotic state. This research aimed to explore whether postprandial metabolic and inflammatory responses to dietary triggers, e.g. saturated fat or fructose, may provide insights into the mechanisms driving the MASLD-MASH transition. Or indeed, better define MASLD vs MASH phenotypes.

METHODS
34 patients with obesity and MASLD and 10 non-obese healthy controls were recruited. Patients with MASLD were stratified according to liver fibrosis score (FibroScan; F0/1 MASLD, n = 18; F2/3 MASH, n = 16). MASLD, MASH, and healthy completed a high-fat mixed meal test (46g fat (33g saturated fat), 50g carbohydrates, 10g protein). MASLD and MASH also completed a high-fructose / glucose challenge (75g fructose, 25g glucose). Blood samples were drawn over 6-hours to evaluate metabolic (glucose, insulin, triglycerides (TAG), non-esterified fatty acids (NEFA)), inflammatory (IL-6) and metabolite responses. *Ex-vivo* cytokine (IL-1β, IL-6, CCL3) responses to bacterial (TLR2/4) and viral (TLR7/8) ligands were determined in whole blood.

RESULTS
Insulin resistance, determined by HOMA-IR, was greater in MASLD and MASH vs healthy. Postprandial increases in glucose, insulin and TAG were significantly greater in patients with MASLD and MASH compared to healthy, but were similar between MASLD and MASH. Plasma IL-6 responses were also similar between MASLD and MASH. Interestingly whole blood inflammatory profiles were distinctly different. MASLD, but not MASH, exhibited greater whole blood cytokine responses to bacterial and viral ligands compared to healthy. The IL-1β response to viral ligands was higher in MASLD versus MASH.

CONCLUSIONS
The preliminary data suggests that whilst a continuum of postprandial metabolic dysfunction presents in MASLD vs MASH, there are nuances with respect to inflammatory responses which may/may not explain fibrotic disease progression.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_064

STUDY ON THE EFFECTS OF CHOLESTEROL LOWERING AND ANTIOXIDANT EFFECTS OF PHYTOSTEROLS AND PHYTOSTEROLS COMBINED WITH PHOSPHOLIPIDS ON SUBJECTS WITH ELEVATED BLOOD CHOLESTEROL MARGINS

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BACKGROUND AND OBJECTIVES
It has been reported that Phytosterols (PSs) have cholesterol-lowering effects, but due to their poor oil solubility and insolubility in water, their bioavailability is low, which may affect the other health effects of PSs. Phospholipids (PLs) as emulsifiers can significantly improve the solubility of PSs. The aim of this study was to examine the effects of PSs and PSs combined with PLs in the prevention and management of disorders associated with dyslipidemia.

METHODS
This study has passed the ethical qualification examination of the Ethics Committee of Dongtai People's Hospital (ethics approval number: 2023-dtry-K048-PJ). A total of 88 volunteers were included and randomly assigned to 3 groups based on inclusion and exclusion criteria. Placebo control was adopted. Each person in the phytosterols group (PS group) took 2g phytosterols +1.3g wheat starch daily, each person in the phytosterols + phospholipids group (PS+PL group) took 2g phytosterols +1.3g phospholipids daily, and each person in placebo group (CON group) took 3.3g wheat starch daily. The samples were divided into capsules and taken with meals. The intervention duration was 2 months. Blood samples were collected and serum liver and kidney function, blood lipids, lipid metabolizing enzymes and oxidative stress related indexes were measured.

RESULTS
A total of 88 eligible volunteers were included, including 29 in PS group, 30 in PS+PL group and 29 in CON group. After 2 months of intervention, the serum levels of TC, LDL-C and ApoB in the two intervention groups were decreased. From the longitudinal comparison, serum alanine aminotransferase (ALT) and lactatedehydrogenase (LDH) of PS+PL group were significantly decreased ($P < 0.05$). Serum ALT level was markedly decreased ($P < 0.05$) in PS group too. After 2 months of intervention, oxLDL content, MDA content, MPO activity and ROS fluorescence value in serum were reduced in the two intervention groups significantly, while CAT activity and GSH-Px activity were significantly increased ($P < 0.05$). Compared with CON group, serum ox-LDL content, MPO activity and ROS fluorescence in PS+PL group and PS group significantly decreased after intervention. After intervention, visceral fat area (VFA) in CON group was significantly increased, while body weight, waist circumference and diastolic blood pressure were significantly decreased in PS+PL group ($P < 0.05$).

CONCLUSIONS
PSs and PSs and PLs combined intervention can significantly improve the lipid metabolism and oxidative stress level of this population.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_065

A MISALIGNMENT BETWEEN GENETIC AND SUBJECTIVE CHRONOTYPES INCREASES SATURATED FAT INTAKE. THE MYFOOD4SENIOR PROJECT

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BACKGROUND AND OBJECTIVES
Chronobiology and its influence on physiological and behavioural processes have significant potential in healthy aging. Chronotype is determined by the rs1801260 *CLOCK* single nucleotide polymorphism, but life-long training and social environment may develop a different chronotype. The aim of the present study was to identify people with misalignment between genetic chronotype and acquired daily habits, and to test whether this may affect body composition or dietary intake.

METHODS
A total of 120 individuals aged 65 and older were genotyped and classified as morning or evening types according to *CLOCK* rs1801260. The Horne and Östberg morningness-eveningness questionnaire was used to measure genotype subjectively and categorize individuals as morning, intermediate or evening types according to their preferred daily routines and habits. If the questionnaire RESULTS did not align with the genotype, a misalignment between subjective chronotype and genetic predisposition was identified. A validated 3-day dietary record was used to record diets, and BIA to measure body composition.

RESULTS
According to the questionnaire, 55.8% were classified as morning types, 42.5% as intermediate types, and 1.7% as evening types. However, regarding the genetic predisposition for the *CLOCK* gene, 49.2% were found to be morning types (A/A) and 50.8% were evening types (A/G + GG). We observed that 54.1% of those genetically identified as evening types followed morning type habits. A misalignment between the subjective and genetic chronotypes was observed in 70.8% of the individuals. No association was found between chronotype misalignment and the body fat, consumption of fruits, vegetables and legumes, or the intake of omega-3 fatty acids. However, a significant association was found between the intake of saturated fatty acids and chronotype misalignment ($p = 0.005$). Specifically, 92.9% of individuals with chronotype misalignment were identified as having inadequate dietary consumption of saturated fatty acids by the diet ($p = 0.005$).

CONCLUSIONS
Despite genetic predisposition, life-long acquired habits can lead to the development of one chronotype over another. This phenomenon may affect dietary intake, particularly with regard to saturated fat intake.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_069

SELF-REPORTED GASTROINTESTINAL DISCOMFORT, CAN FERMENTED SKIM MILK POWDER OFFER RELIEF?

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BACKGROUND AND OBJECTIVES
Gastrointestinal discomfort is widespread and carries both economic and social consequences (1). Limited evidence exists on potential dietary treatments to support gastrointestinal health in non-inflammatory bowel disease (IBD) populations. In-vitro studies have demonstrated that targeted fermented dairy products may have the capability to improve human gut health (2). This study aims to investigate the potential of a fermented skimmed milk powder to improve digestive health and quality of life in a non-patient cohort.

METHODS
In an 8-week parallel, double-blind randomised controlled trial, *n* 146 adults aged 20-45 years with self-reported gastrointestinal symptoms consumed 20g/day of a fermented skimmed milk powder (FSMP), skimmed milk powder (SMP) or maltodextrin. Groups were allocated on a 3:1:1 basis. Validated questionnaires were used to collect information pre- and post-intervention using the Functional Digestive Disorders Quality of Life (FDDQoL) (3), the Bristol Stool Form Scale (BSFS, 4) and Patient Assessment of Constipation Quality of Life (PACQoL) (5). ANOVA adjusting for baseline values, age, sex, baseline BMI and study site was performed using SPSS. The trial is registered as ISRCTN17696788.

RESULTS
A total of *n* 89 (64%) female subjects completed the trial, with a mean ± SD age of 34.9 ± 5.8 years and a BMI of 26.1 ± 4.4 kg/m2. In preliminary analyses, a 'normal' stool consistency was reported by *n* (49.1%) pre-intervention, and *n* 21 (38.2%) post-intervention, with no differences in response across groups (P=0.183). Within the 'Discomfort' domain of the FDDQoL, comfort score increased by a greater extent in the SMP group (16.1 ± 0.1) vs FSMP (6.9 ± 0.8, P=0.029) and maltodextrin (2.1 ± 1.3, P=0.11) compared to baseline. There were no differences in any PACQoL domains across groups at baseline or in response to treatment.

CONCLUSIONS
Sub-clinical gastrointestinal discomfort is prevalent in populaitons worldwide, although studies in non-patient/non-IBD cohorts are lacking. Preliminary analysis indicates FSMP and SMP may have some beneficial effects on aspects of functional digestive disorder in a non-clinical cohort, compared to an energy-mathed maltodextrin control. Further analysis will determine the potential of fermented or non-fermented skimmed milk powder to releive gastrointstinal symptoms in a non-patient cohort.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_071

A NOVEL PERSONALISED NUTRITION INTERVENTION WITH TAILORED BEHAVIOURAL SUPPORT TO PROMOTE LEGUME CONSUMPTION IN UNIVERSITY STUDENTS

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BACKGROUND AND OBJECTIVES
Personalised nutrition (PN) interventions have primarily focused on using differences in biological traits to generate PN advice (1). Such advice is purported to promote larger, more appropriate, and sustained changes in dietary behaviour relative to generic dietary advice (2). However, evidence on the effect of PN interventions on dietary behaviour change is mixed, particularly when behavioural support is balanced between intervention and control groups (3,4). As populations must move towards eating sustainable and healthy diets (SHDs), PN interventions that provide tailored behavioural support may enhance the consumption of less commonly eaten foods central to SHDs, such as legumes. This feasibility trial sought to test the efficacy, feasibility, and acceptability of a novel PN intervention incorporating tailored behavioural support for improving legume intakes in young, healthy university students.

METHODS
Young, healthy university students (aged 18–30 years) were recruited from the UCD PLAN'EAT Living Lab (5). Intervention development was guided by the Behaviour Change Wheel (6). Intervention group participants received a PN intervention plus tailored behavioural support based on their primary self-selected barrier to legume consumption. Control group participants received a PN intervention without tailored behavioural support. At baseline, participants completed ≥2 24-hour dietary recalls, received a PN report detailing a recommendation to improve their legume intake, and underwent an in-person diet counselling session with a nutritionist. After ~4 weeks, participants completed ≥2 24-hour dietary recalls. Change in legume intake was measured using analysis of covariance. All data analysis was conducted using R (v.4.3.1).

RESULTS
A total of 59 students were randomised to a control or intervention group (*n*=57 entered the trial; *n*=41 female; *n*=16 male). Of those randomised to the intervention group, 14 (50%) selected 'lack of convenience' as their top barrier to eating more legumes, whereas 7 (25%) reported 'lack of cooking skills' and 7 (25%) reported 'lack of habit'. Preliminary RESULTS suggest that legume intakes have improved in both the control and intervention groups.

CONCLUSIONS
RESULTS will help to shed light on the efficacy of tailoring behavioural support to individuals within PN interventions, and will guide the development of a larger trial focused on promoting SHDs in UCD PLAN'EAT Living Lab participants.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_072

EFFET OF A COMMUNICATION PROGRAM ON THE DIETARY BEHAVIOUR OF THE YOUNG FEMALE HANDBALL TEAM

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BACKGROUND AND OBJECTIVES
When preparing for top-level competitions, Beninese women handballers from different regions follow the same diet. However, they do not have a nutritional education and communication program to help them adopt performance-enhancing eating behaviour. Despite rigorous physical and technical-tactical preparation, they do not reach the continental level of the Challenge Trophy. The aim of the study was to determine the effect of a nutritional education and communication program offered in 2019 to Benin young female handball players on their eating behaviour.

METHODS
This is an intervention study conducted with 36 handball players aged 13 to 19, selected through a non-random method and the exhaustive selection technique at the training camp of the 2019 Challenge Trophy tournament. Data on physiological, social, cultural and psychological determinants of eating behaviour were collected by observation and questionnaire, as appropriate, before and after the intervention. Descriptive statistics were used to analyze the data, and the McNemar test was employed to analyze contingency tables.

RESULTS
Fifteen of the 36 players significantly improved their eating behaviour from zero at baseline to good ($p = 0.0001$). Physiological, social, cultural and psychological determinants of eating behaviour all improved with $p = 0.0001$.

CONCLUSIONS
The proposed PC+PEN led to a significant improvement in the eating behaviour of young female handball players in preparation for the 2019 Challenge Trophy. The nutrition education sessions and the consideration of the players' food preferences in their diet could have a greater impact in a future study.

CONFLICTS OF INTERESTS
none of the authors has a conflict of interest

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EPO7_074

NUTRITIONAL INTERVENTIONS AND GENETIC RISK: INSIGHTS INTO GESTATIONAL WEIGHT GAIN AND GLYCEMIC CONTROL IN PREGNANT WOMEN WITH DIABETES, CONSIDERING THE RS9939609 FTO POLYMORPHISM

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BACKGROUND AND OBJECTIVES

Diabetes mellitus (DM) significantly increases the risk of adverse outcomes of pregnancy. Glycemic control and the adequacy of gestational weight gain (GWG) are key strategies to mitigate such effects [1]. In this context, the rs9939609 (T>A) polymorphism in the Fat Mass and Obesity Associate Gene (FTO) may negatively influence dietary intake, body weight, and blood glucose levels [2]. This study aimed to evaluate the influence of the rs9939609 polymorphism on dietary intake, GWG, and glycemic control in pregnant women with pregestational DM.

METHODS

This cross-sectional study included pregnant women with pregestational DM attending a public maternity hospital. All women received insulin treatment and were provided with nutritional support specific to managing DM during pregnancy. Participants were genotyped for the rs9939609 polymorphism and dietary intake was assessed using a Food Frequency Questionnaire (FFQ) applied within 12 weeks before delivery. GWG adequacy was classified based on the Institute of Medicine guidelines [3] and glycemic control was assessed using glycated hemoglobin (HbA1c). Statistical analyses included conventional robust tests.

RESULTS

The study involved 68 women with 31.57 years old (SD 6.06), 41.2% had type 1 DM and 58.8% had type 2 DM. The pregestational BMI was 29.65 kg/m2 (SD 5.74), without difference comparing the genotypes. The GWG adequacy, glycemic control, and dietary intake differed between genotypes. Women with the AT genotype reported a higher daily caloric and carbohydrate intake compared to those with the AA genotype (2221.69 Kcal vs. 1757.84 Kcal, p=0.05; 1080,17 Kcal vs. 820,58 Kcal, p=0.04) and exhibited higher HbA1c than AA carriers (6,77% vs. 5,78%, p=0.03). However, carriers of the AA genotype had a higher prevalence of excessive GWG (70%) compared to the AT (30.4%) and TT (28.6%) genotypes (p=0.045) at the time of the dietary assessment.

CONCLUSIONS

These RESULTS suggest that women carrying the AA genotype experienced excessive GWG despite consuming fewer calories and carbohydrates, while exhibiting better glycemic control compared to those with the AT genotype. It appears that dietary recommendations should be tailored according to genotype to prevent GWG and improve glycemic control. Women with DM who carry the rs9939609 polymorphism may require a tailored personalized dietary approach to optimize pregnancy outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_075

RELATIONSHIP BETWEEN BONE MINERAL METABOLISM AND NUTRITIONAL STATUS: INTERPLAY OF ALBUMIN, PHOSPHORUS, CALCIUM, AND TRIGLYCERIDES IN HEMODIALYSIS PATIENTS

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BACKGROUND AND OBJECTIVES
Albumin is an essential marker of nutritional status in hemodialysis (HD) patients, whose levels may be indirectly influenced by metabolic factors such as phosphorus, calcium, and triglycerides, through inflammatory processes and metabolic alterations characteristic of this population. Therefore, the aim of this study was to determine the association between albumin levels and phosphorus, calcium, and triglyceride parameters in HD patients, identifying their role as indicators of nutritional status.

METHODS
Data from 168 patients on three-weekly HD were analyzed. Pearson correlations between albumin and metabolic indicators (phosphorus, calcium, triglycerides) were evaluated. Subsequently, multiple linear regression analysis was performed with albumin as the dependent variable and phosphorus, calcium, and triglycerides as predictors to evaluate their joint effects.

RESULTS
Phosphorus presented a positive and significant association with albumin ($r=0.278$, $p<0.001$), while calcium ($p=0.137$) and triglycerides ($p=0.092$) did not show significant relationships. The multiple linear regression model explained 8.7% of the variability in albumin levels. Phosphorus was the only significant predictor ($\beta=0.057$, $p<0.001$), highlighting its crucial role in nutritional status. Although triglycerides showed a trend close to significance ($p=0.058$), calcium had no statistically significant influence ($p=0.207$).

CONCLUSIONS
The RESULTS of the study highlight that phosphorus is a significant predictor of albumin levels, while calcium and triglycerides did not show clear relationships. This highlights the role of mineral metabolism, specifically phosphorus, in the nutritional status of HD patients. The positive relationship between phosphorus and albumin could be associated with higher protein intake, given that protein sources are usually rich in organic phosphorus. These findings underscore the importance of individualizing nutritional strategies in HD patients, balancing the need for adequate protein intake to maintain optimal albumin levels with organic phosphorus management to prevent complications related to mineral metabolism. This integrated approach could optimize both nutritional status and clinical outcomes in this population.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_076

THE PARADOX OF ADIPOSITY IN HEMODIALYSIS: NUTRITIONAL AND CARDIOMETABOLIC INSIGHTS FROM DIABETIC AND NON-DIABETIC PATIENTS

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BACKGROUND AND OBJECTIVES

Coronary heart disease is the leading cause of mortality among hemodialysis (HD) patients, closely associated with nutritional deterioration and chronic inflammation. The theory of reverse epidemiology (RE) suggests that greater adiposity might confer survival advantages in HD patients, despite its known links to inflammation and metabolic complications. Understanding this paradox is critical to addressing the nutritional and cardiometabolic challenges in this population. This study aimed to assess nutritional deficiencies in diabetic (DM) and non-diabetic (NDM) patients undergoing HD at an Italian dialysis center and to analyze the impact of long-term HD on cardiometabolic parameters, considering the implications of RE.

METHODS

This cross-sectional study included 60 chronic HD patients (DM:n=18, mean age: 73.1 ± 11.4 years; NDM:n=42, mean age:64.3±18.5 years). Nutritional indicators (brachial muscle area [AMB], brachial fat area [AGB], lean tissue index [LTI], fat tissue index [FTI]), biochemical markers (transferrin, vitamins B9, B12, D, bicarbonate, creatinine, albumin), inflammatory markers (C-reactive protein [CRP], ferritin), residual diuresis, years on dialysis, and cardiometabolic parameters (lipid profile, glycemia, calcium-phosphorus ratio) were measured. Statistical analyses included descriptive statistics, Student's t-test, and Pearson correlation, using SPSS version 11.0. A p-value <0.05 was considered statistically significant.

RESULTS

DM patients exhibited a significantly higher FTI (12.6 ± 5.0) compared to NDM patients (9.1 ± 5.5; p=0.03). Longer HD duration correlated with decreased AMB (p=0.02), elevated CRP levels indicating increased inflammation (p=0.01) and reduced pre-dialysis blood urea nitrogen (pre-BUN) levels (p=0.02) in both DM and NDM groups. No significant differences in other nutritional indicators were observed between the two groups.

CONCLUSIONS

The nutritional status of DM patients on HD is notably compromised, characterized by an imbalance between excess adiposity and reduced lean mass, often associated with HD-related protein-energy wasting. Chronic inflammation, exacerbated by prolonged HD and malnutrition, contributes to reduced protein intake, as reflected in lower pre-BUN levels. Interestingly, RE suggests that higher adiposity may provide a survival advantage in HD patients, despite its potential to intensify inflammation. Further research is needed to elucidate the complex interplay between adiposity, inflammation, and survival outcomes.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_077

DNA METHYLATION OF AMINO ACID TRANSPORTER GENE IN THE HUMAN PLACENTA ASSOCIATED WITH OFFSPRING GROWTH AND BODY COMPOSITION

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BACKGROUND AND OBJECTIVES
The human placenta exhibits a unique DNAm profile that is characterized by large hypomethylated regions interspersed with hypermethylated regions. The epigenetic regulation of amino acid transporters in maternal-fetal tissues is poorly understood. This study investigated the DNA methylation (DNAm) status of the amino acid transporter SNAT1 and its gene expression in uterine decidua and placental villi and the association of the findings with maternal-fetal-neonatal parameters.

METHODS
Pregnant women from the Araraquara Cohort Study (n=64) were followed up during pregnancy until delivery. Uterine decidua and placental villus samples were collected to assess DNAm levels by methylation-sensitive restriction endonuclease qPCR. Fetal growth and newborn body composition were assessed by ultrasonography and plethysmography, respectively. Univariate and multiple linear regression models were used to explore the associations of DNAm with markers of fetal and neonatal growth and body composition.

RESULTS
DNAm of SNAT1 in uterine decidua was associated with fetal thigh muscle (p=0.025) and newborn thoracic circumference (TC) (p=0.002) and fat-free mass (p=0.041). In placental villi, DNAm of SNAT1 was associated with fetal thigh muscle mass (p=0.049) and newborn TC (p=0.039) and head circumference (HC) (p=0.023)

CONCLUSIONS
SNAT1 was associated with multiple fetal-neonatal growth and body composition parameters, particularly those related to the muscle mass compartments.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_078

IMPLEMENTATION OF THE GLIM NUTRITIONAL SCREENING IN ELDERLY PATIENTS ON CHRONIC HEMODIALYSIS: A NEW NUTRITIONAL ASSESSMENT TOOL

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BACKGROUND AND OBJECTIVES
Malnutrition is a prevalent condition in elderly hemodialysis (HD) patients, underscoring the need for accurate diagnostic tools applicable to this population. The Global Leadership Initiative on Malnutrition (GLIM) proposes diagnostic criteria that combine phenotypic (such as weight loss, low body mass index, and reduced muscle mass) and etiologic (such as insufficient intake and inflammation) factors. However, validation of these criteria in the specific context of chronic kidney disease (CKD) remains limited. The aim of this study was to evaluate the applicability of the GLIM criteria in CKD patients on HD to identify more effective strategies for the diagnosis and management of malnutrition in this population.

METHODS
Retrospective study in 123 patients on chronic HD (mean age 77,3 ± 6,57 years, M/F 98/25, 43,1% with diabetes). All participants underwent routine nutritional assessment (anthropometry, bioimpedance (BIA) and nutritional screening by Mini nutritional assessment (MNA) and prognostic assessment using the multidimensional prognostic index (MPI). According to the GLIM criteria, a patient was considered malnourished if he/she met at least one phenotypic criterion and one etiological criterion (which, in the case of HD patients, is inherently met).

RESULTS
MNA showed a low specificity, which led to consider all patients within the GLIM criteria. 32% of patients could not undergo evaluation by BIA, mainly due to exclusions related to cardiovascular criteria. Among the patients evaluated with BIA, 23% had a reduced lean mass index (LTI). In total, 44,6% of patients met the phenotypic criteria defined by GLIM, which allowed us to identify 17 additional patients at risk of malnutrition. Those meeting GLIM criteria tended to have a higher dialysis adequacy ratio (KT/V), lower parathyroid hormone (PTH) levels, and decreased triglyceride and serum albumin values. On the other hand, no significant association was found between GLIM criteria and the presence of cognitive impairment or mobility problems. However, 31,4% of patients reported loss of appetite during the last three months, together with digestive problems, chewing or swallowing difficulties.

CONCLUSIONS
Implementation of the GLIM criteria may facilitate earlier diagnosis and guide personalized nutritional interventions, helping to prevent progression to more severe conditions such as sarcopenia and functional decline. The GLIM criteria represent a promising advance in the assessment of malnutrition in CKD patients on HD.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_079

IMPACT OF AN INTRADIALYTIC EXERCISE PROGRAM ON BODY COMPOSITION, PHYSICAL FUNCTIONALITY, CARDIOMETABOLIC CONDITION AND QUALITY OF LIFE IN HEMODIALYSIS PATIENTS: A PILOT STUDY

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BACKGROUND AND OBJECTIVES
Patients undergoing hemodialysis (HD) experience physical deterioration and heightened cardiovascular risk, which adversely affect their quality of life and clinical outcomes. Regular physical activity can counteract these effects by enhancing muscle mass, aerobic capacity, physical functionality, and dialysis efficiency. This pilot study aimed to evaluate the impact of an aerobic and resistance exercise program on body composition, physical functionality, cardiometabolic status, and quality of life in adults and elderly patients undergoing HD.

METHODS
A three-month quasi-experimental study was conducted with 13 HD patients (mean age 58.3 ± 9.1 years) receiving tri-weekly dialysis, of whom 9 completed the intradialytic exercise program. The intervention included three supervised weekly sessions lasting 45–60 minutes during the first two hours of dialysis. Sessions consisted of warm-up exercises (low-intensity joint mobility), aerobic activities (treadmill walking), resistance training (elastic bands), and cool-down stretches. Pre- and post-intervention assessments included anthropometric measurements (e.g., BMI, brachial circumference [BC], tricipital skinfold [TCP], brachial muscle area [BMA], % total body fat [%TBF]), functional tests (hand grip strength, Timed Up and Go test), biochemical markers (e.g., albumin, creatinine), and quality-of-life evaluations using the SF-12 questionnaire.

RESULTS
Significant improvements were observed in lean body mass (31.35 ± 6.04 kg to 32.00 ± 4.11 kg; p=0.045) and BC (29.45 ± 3.40 cm to 30.21 ± 3.51 cm; p=0.034). Quality of life also improved significantly in the mental health domain of the SF-12 (p=0.049). However, changes in %TBF, calf circumference, hand grip strength, albumin, and creatinine levels were not statistically significant.

CONCLUSIONS
The RESULTS demonstrate the positive impact of intradialytic exercise on the health and well- being of patients, showing improvements in body composition, physical functionality, and quality of life. This pilot study is a promising model for integrating exercise as a therapy in HD. However, the small sample size, short duration and heterogeneity limit the generalizability of the RESULTS. Therefore, a second phase of the study with a larger sample size and prolonged follow-up is planned, as well as the incorporation of nutritional support to strengthen the findings.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_081

CLINICAL PHENOTYPE ASSOCIATES WITH GUT MICROBIOME IN OLDER JAPANESE WITH CARE NEEDS IN NURSING HOME

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BACKGROUND AND OBJECTIVES

Frailty increases the risk of needing nursing care and significantly affects the life and functional prognosis of older individuals. Early detection and tailored interventions are crucial for maintaining and enhancing their life functions. Recognizing distinct clinical phenotypes is essential for devising appropriate interventions. This study aimed to explore diverse frailty phenotypes, focusing on poor nutrition in older Japanese individuals through observational research. In addition to nutritional assessments, metabolic products were also measured and examined to gain a deeper understanding of the frailty phenotypes.

METHODS

Twenty-one nursing home residents underwent a comprehensive survey covering physical, blood, dietary, cardiac, cognitive, nutritional, nursing care, frailty, agitated behavior, metabolic products, and gut microbiome assessments (high-throughput 16S rRNA gene sequencing). Using clustering analysis with 239 survey items (excluding gut microbiome), participants were classified into subgroups based on clinical phenotypes, and group characteristics were compared through analysis.

RESULTS

Individuals with moderate or severe frailty and suspected dementia formed subgroups with distinct clinical phenotypes based on nutritional, defecation, metabolic, and nursing care statuses. The gut microbiome significantly varied among these groups ($p = 0.007$), indicating its correlation with changes in clinical phenotype. Nutritional status differences suggested poor nutrition as a differentiating factor in the core clinical phenotype. The analysis of metabolic products further confirmed the relationship between nutritional status and frailty phenotypes.

CONCLUSIONS

This study proposes that the gut microbiome differs based on the clinical phenotype of Japanese older individuals with frailty, and targeted interventions addressing the gut microbiome may contribute to preventing frailty in this population.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_082

OBESITY AND LIPID-RELATED INDICES FOR PREDICTING METABOLIC-ASSOCIATED STEATOTIC LIVER DISEASE IN RENAL TRANSPLANT RECIPIENTS IN TAIWAN

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BACKGROUND AND OBJECTIVES

The association between metabolic-associated steatotic liver disease (MASLD) and obesity-related indices has typically been analyzed in isolation, with limited comparative evidence, particularly in renal transplant recipients (RTRs). This cross-sectional study aimed to assess the predictive performance of various obesity and lipid-related indices for identifying MASLD in RTRs in Taiwan.

METHODS

Participants aged 18 years or older were recruited from a single-center hospital. Data on height, weight, waist circumference (WC), triglycerides, and fasting blood glucose were collected from medical records to calculate body mass index (BMI), body roundness index (BRI), lipid accumulation product (LAP), and triglyceride-glucose (TyG) index. MASLD was determined using the hepatic steatosis index (HSI), calculated as 8 × (aspartate aminotransferase/alanine aminotransferase ratio) + BMI + 2 (if diabetic) + 2 (if woman). Predictive performance was evaluated using receiver operating characteristic (ROC) curves, with areas under the curve (AUCs) categorized as good (0.7-0.9).

RESULTS

Among the participants, 25.55% (57.14% male) were classified as having MASLD (HSI > 36). The ROC analysis indicated that BRI had the highest predictive ability (AUC = 0.843), followed by WC (AUC = 0.833), LAP (AUC = 0.829), and TyG (AUC = 0.722).

CONCLUSIONS

BRI demonstrated the strongest predictive performance for identifying MASLD in RTRs, with WC also exhibiting substantial diagnostic potential. These findings suggest that anthropometric-related indices provide better predictive ability for MASLD screening in RTRs, while lipid-related indices also offer reasonable predictive performance.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_084

DISTINCTIVE IMPLICATIONS OF BASAL BLOOD GLUCOSE AND POSTPRANDIAL GLUCOSE INCREMENT AMONG WOMEN WITH GESTATIONAL DIABETES MELLITUS AND POTENTIAL FOR PRECISION NUTRITION

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BACKGROUND AND OBJECTIVES
The glycemic response to identical meals is highly variable among healthy individuals[1], but little is known about the personalized postprandial glucose response among pregnant women with gestational diabetes mellitus (GDM) and its relationship with the birth outcomes.

METHODS
Based on the previously reported WeBirth cohort[2], we included 1,789 pregnant women with available continuous glucose monitoring (CGM) data. These participants were connected to a CGM sensor for 14 days and daily food intakes were recorded. Moreover, 1,224 women participated in a one-day standard meal intervention while connected to the CGM sensor. In the subsequent statistical analysis, the participants were divided into a discovery cohort and a validation cohort according to their recruitment time before or after the onset of the COVID-19 pandemic. Logistic regression was applied to examine the associations between CGM-derived indices and adverse birth outcomes (i.e., LGA, large-for-gestational-age birth; SVN, small vulnerable neonate).

RESULTS
We constructed a series of indices from the CGM data collected on the day of the intervention, including area under the curve (AUC), time in range (TIR) and mean blood glucose (MBG). We further subtracted the incremental area under the curve (iAUC) from the AUC, also yielding the index indicating the basal blood glucose level (basal AUC). We found that AUC on the day of the intervention was positively associated with LGA ($p<0.01$ for both discovery and validation cohort). Moreover, the basal AUC, which exhibited small inter-individual variations (CV, 11.1%), drove the identified associations ($p<0.01$ for both discovery and validation cohort), whereas the iAUC, characterized by large inter-individual variations (CV, 37.2%), was not significantly associated with the risk of adverse birth outcomes. This indicates that occasionally tested basal AUC may reflect long-term glycemic control, whereas the iAUC is more dynamic and sensitive to consumed meals. By integrating the repeatedly measured iAUC and the glycemic load (GL) of the corresponding meals, we further created a Personalized Glycemic Sensitivity Index (PGS) at the single-subject resolution, to quantify the personalized glycemic sensitivity. The PGS was positively associated with the risk of SVN ($p<0.05$).

CONCLUSIONS
The AUC encompasses two dimensions of postprandial glucose response: basal AUC and iAUC, each indicating distinct clinical implications for GDM. The iAUC-derived PGS quantifies personalized glycemic sensitivity to GL, exhibiting great potential for personalized nutrition.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_085

NUTRITION ASSESSMENT IN PATIENTS WITH METABOLIC OBESITY IN RENAL TRANSPLANT RECIPIENTS

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BACKGROUND AND OBJECTIVES
Obesity is an established risk factor for cardiovascular disease (CVD) and has been increasing globally over the past 40 years. CVD is the leading cause of mortality in post renal transplant recipients (RTRs). Well nutritional status is a protective factor of CVD. However, relevant published study in RTRs is limited.

METHODS
A total of 299 RTRs were enrolled in this cross-sectional study from 2016 to 2024. Nutrition assessment data were retrieved from medical records. Statistical analysis was performed using SPSS Statistics software, 27 version.Particitants were categorized into the following groups based on their body mass index(BMI) an the presence of metabolic abnormalities(fasting glucose<100mg/dL,triglyceride<150mg/dL,HDLcholeserol≥40mg/dL for men or ≥50mg/dL for women,and blood pressure<130/85mg/dL)：Normal-weight group(NW), Normal-weight with metabolic abnormalities group(NWMA),Obesity with normal metabololism group(ONM), Obesity with metabolic abnormalities group(OMA).

RESULTS
The characteristics data showed that individual with a NW have higher caloric and protein intake compared to those with OMA in RTRs. Protein and vitamin B6 intake were showed higher trend of individuals with OMA compared to those with a NW in RTRs. No significant difference in physical activity levels regardless of obesity or metabolic abnormality status in RTRs. In the body composition analysis RESULTS, fat-free mass is significantly higher in individuals with obesity or metabolic abnormalities and skeletal muscle mass is significantly higher in individuals with OMA compared to those with a NW in RTRs.

CONCLUSIONS
OMA was associated with lower muscle mass and protein intake. Further interventional study may focus on this association and prevents obesity and metabolic syndrome in RTRs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_086

ARE REGISTERED DIETITIANS READY TO TAKE RESPONSIBILITY FOR PRESCRIPTION OF PARENTERAL NUTRITION AND INTRAVENOUS NUTRIENTS?

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BACKGROUND AND OBJECTIVES
Parenteral nutrition (PN) and intravenous (IV) nutrients are Schedule III and IV substances and require advanced knowledge and comprehensive training to optimise nutrition support and minimise risks. The objectives of this study were to determine the knowledge of registered dietitians (RDs) in South Africa (SA) regarding PN and IV nutrients, and to explore the attitudes, practices, and factors influencing the recommendation of PN and IV nutrients.

METHODS
A mixed methods approach with an explanatory sequential design was used. Registered dietitians (N=145) participated in an online self-administered questionnaire and semi-structured interviews were undertaken with purposively selected individuals (N=6).

RESULTS
Most participants (64%, n=93/145) actively recommend PN/IV nutrients and felt RDs should have the authority to prescribe (77%, n=108/140). Only 11% (n=11/104) had a good knowledge score >65%. Those practicing for ≥7 years or with additional training demonstrated significantly better knowledge scores ($p<0.001$ and $p=0.002$), emphasising the need for additional training (PN: $p=0.019$; IV nutrients: $p=0.018$). Findings underscored RDs' pivotal role in PN/IV nutrients prescription. It also revealed knowledge gaps pertaining pharmaceutical aspects, IV nutrients and prescribing rights.

CONCLUSIONS
There is a disparity between RDs' perceived competence and their actual knowledge of PN and IV nutrients. RDs need more education and training to ensure their competency and confidence in the discussion, recommendation and management of PN and IV nutrients for adults. The research suggests a need for clarity on legal responsibilities in prescribing rights to ensure consistency in prescription practices between health care professionals and health sectors in SA.

CONFLICTS OF INTERESTS
Bianca Kroukam is employed by a company that manufacture and sell parenteral nutrition products. The research was conducted independently, and the company had no affiliation to the project and reported findings whatsoever. The other authors declare no conflicts of interest.

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EPO7_087

PECTIC OLIGOSACCHARIDS (POS) FROM POTATO EXHIBIT DIFFERENT BIOACTIVITIES BASED ON THEIR STRUCTURAL DETAILS SUCH AS MOLECULAR WEIGHT AND DEGREE OF METHYLATION

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BACKGROUND AND OBJECTIVES

Pectins are colloidal fibers strongly studied and recognized for health benefits such as improvements of blood lipids with a decrease in cholesterol levels and blood glucose management, thus conferring them regulatory health claims. They are complex polysaccharides with different structural subparts: homogalacturonan (HG), rhamnogalacturonan-l (RG-I), and substituted galacturonans. RG-I has been called the "hairy region" of pectin and are known to be a preferential substrate of different gut bacteria, thus conferring prebiotic properties to pectins. These high molecular weight (Mw) molecules can be hydrolyzed into smaller size compounds: pectic oligosaccharides (POS), that can offer different properties such as higher solubility and lower viscosity than the parent molecules.

METHODS

We investigated here the role of structural details such as Mw and degree of methylation (DM) on parameters linked to immunity and inflammation using Caco2 (derived Carcinoma colonic cells) /PBMC (Peripheral Blood Mononucleic Cells) coculture and *ex vivo* fermentation models. Pectins and POS fine structures (sugar composition and ramifications) are very different depending on their vegetal origins, making impossible their strict comparison in one study. Thus, gathering information from literature and our own tests, correlations between structural details and parameters related to immunity and inflammation could be established.

RESULTS

Using the CaCo2/PBMC model to mimic epithelium passage and communication towards immune cells, we observed an immune-stimulation as PBMC secreted pro inflammatory cytokines such as IL-1β and TNF-α. To the contrary, when PBMC were stimulated using LPS (Lipopolysaccharides) to simulate inflammation, when exposed to POS, PBMC induced a decrease in the secretion of the same pro-inflammatory cytokines. This effect was observed for both tested Mw, showing a role of DM in this bioactivity. In the colonic ex vivo experiment, Mw was key in the response of gut microbiota to POS in the medium with a higher SCFA (Short Chain Fatty Acids) production for the higher Mw prototype.

CONCLUSIONS

By understanding the impact of structural details on the mechanisms of action of bioactive pectins and POS, we propose here a way to choose the accurate ingredient targeting precise health benefits for each kind of population.

CONFLICTS OF INTERESTS

Clémentine Thabuis, Ludivine Gras and Caroline Perreau are Roquette Frères employees.

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EPO7_088

THE EFFECT OF PROBIOTIC SUPPLEMENTATION ON STRESS AMONG UNIVERSITY STUDENTS: A RANDOMIZED, CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
Probiotics' role in stress alleviation has gained attention due to their potential to modulate the gut-brain axis (1). However, research on university students, who face significant academic stress, is limited (2,3). This study examined the effect of probiotic supplementation on stress levels among Saudi students.

METHODS
This randomized controlled trial involved healthy Saudi university students aged≥18 years with moderate or high Perceived Stress Scale (PSS) scores (4). The study was registered on ClinicalTrials.gov (NCT06464484). Validated English and Arabic versions (5) of the PSS were used. Exclusion criteria were chronic illnesses, psychiatric conditions, use of medications or supplements in the past month, pregnancy, breastfeeding, smoking, and low stress scores (0–13). Participants were randomized into an intervention group receiving probiotic capsules (Lactobacillus rhamnosus GG, 6×10^9 CFU, Dicoflor 60) once daily for 30 days and a control group receiving no intervention. Stress levels (PSS), anthropometrics, and bowel function (6) were collected at baseline and endline.

RESULTS
Out of 121 screened participants, 15 were excluded for recent medication, supplement, or laxative use, and 19 for low stress scores or prior rectal/anal fistula surgeries. Eighteen did not complete the trial, resulting in a final sample of 69. Participants had a mean±SD age of 21.5±2.3 years, 55% were males, and 40.6% had BMI≥ 25 kg/m2 (overweight/obesity). At baseline, there were no significant differences in mean age, BMI, or stress scores. At endline, stress scores were significantly reduced in both the intervention (22.82±4.58 vs. 14.21±6.05, $p<0.001$) and control groups (23.63±4.05 vs. 21.17±5.68, $p<0.05$) using paired t-test. However, the intervention group had lower stress scores at four weeks compared to the control group (14±6.05 vs. 21.17±5.68), using two sample t-test. This difference remained significant in the regression analysis when adjusting for baseline stress scores. No significant sex differences in stress scores were observed.

CONCLUSIONS
Probiotic supplementation effectively reduced stress scores in Saudi university students, irrespective of baseline stress levels and sex, indicating its potential as a stress management intervention for high-risk groups.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_089

SOLUBLE PREBIOTIC FIBER PROMOTES BENEFICIAL SACCHAROLYTIC BACTERIA IN HIGH AND LOW FIBER DIET POPULATIONS

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BACKGROUND AND OBJECTIVES
Soluble prebiotic fibers positively shift microbiota composition, stimulating beneficial metabolites like short-chain fatty acids and providing health benefits. Host factors, including diet, might influence individuals' microbiome and shape their responses to prebiotics. This study aimed to evaluate the effects of a soluble prebiotic fiber on microbiota composition and function in two populations with differing dietary fiber intake: high or low.

METHODS
In a multicenter, randomized, placebo-controlled, double-blinded, parallel study, 124 subjects were recruited. This included 67 individuals with high fiber consumption (≥ 25 g/day) and 57 individuals with low fiber consumption (≤ 15 g/day). Participants were divided into two arms and consumed either 15 g of NUTRIOSE® FB06 soluble fiber (SF) or 15 g of GLUCIDEX® 21 (placebo) over a 4-week period. Fecal samples were collected at the beginning and end of the supplementation period. Microbiota composition and function were assessed using Shotgun metagenomics. The data were analyzed with a generalized linear mixed model, considering fixed effects such as visit, product, group, baseline value of the study endpoint, second and third interactions, and subject as random effect.

RESULTS
A total of 112 volunteers completed the study without major deviations, 58 in the placebo arm (25 low fiber, 33 high fiber) and 54 in the SF arm (25 low fiber, 29 high fiber). No significant differences in microbiota diversity were observed between the SF and placebo arms at baseline and across the study. However, after 4 weeks of consumption, the SF arm showed a significant higher relative abundance of the *Parabacteroides* genus compared to placebo arm (5.466% vs 1.437%, $p<0.0001$) that was similar in high and low fiber consumption subgroups (5.63% and 5.25% respectively, $p<0.0001$ in both subgroups). Beyond this pronounced effect, some differences in response were observed between high and low fiber consumers. These taxonomic changes were accompanied by a higher relative abundance of α-glucosidase (high fiber group only, $p=0.0008$) and beta-glucosidase-related genes (overall, $p=0.0014$) in SF compared to placebo.

CONCLUSIONS
Despite some differences in microbiota composition between high and low fiber consumption subgroups, overall, the intake of soluble prebiotic fiber in both subpopulations induces changes in the composition and function of the microbiota by promoting the proliferation of saccharolytic bacteria.

CONFLICTS OF INTERESTS
Laetitia Guérin-Deremaux, Caroline Perreau and Clémentine Thabuis are employees of Roquette FrèresThomas Carton, Diego Tomassi and Lou Beuvin are employees of Biofortis

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EPO7_090

A CROSS-SECTIONAL STUDY ON ORAL FRAILTY AND APPETITE IN COMMUNITY-DWELLING OLDER ADULTS

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BACKGROUND AND OBJECTIVES
The older adults are steadily increasing, and problems in medical care and nursing care have made health management and the extension of healthy life expectancy an urgent issue for older adults. In order to prevent older adults from transitioning to a state requiring long-term care, it is important to prevent and improve frailty, which is the pre-stage of long-term care. In recent years, oral frailty has been attracting attention as an important factor seen in the early stages of frailty, and it is known that older adults with oral frailty are at a higher risk of developing malnutrition than healthy older, but the relationship with appetite and oral frailty has not been clarified. Therefore, this study was conducted to clarify the relationship between appetite and oral frailty, to prevent oral frailty, and to demonstrate effective measures to deal with frailty.

METHODS
The subjects of the analysis were 212 community-dwelling older adult (98 men and 114 women) who participated in the Nagoya Longitudinal Follow up for Healthy Elderly (NLFS-HE). The survey consisted of questionnaires (basic information, frailty index, appetite questionnaire: Council on Nutrition Appetite Questionnaire-J (CNAQ-J), Dietary Intake Status: a brief-type self-administered diet history questionnaire, dietary variety score (DVS)) and actual measurements (physical measurements, oral function assessment, etc.). The subjects were classified into a healthy (robust) group as those who met the Oral Frailty 5-item Checklist (OF-5) criteria for less than two items, and an OF group as those who met two or more items.

RESULTS
Of the subjects analyzed, 90 people (42.5%) were in the OF group. Significant differences were observed between the OF group and the robust group in age, sex, Frailty index, number of medications taken, CNAQ, and DVS. As a result of the binary logistic regression analysis, the nutrition-related indices that were associated with OF were CNAQ-J (OR: 0.78, 995% CI: 0.74 –0.91) and DVS (OR: 0.85, 95% CI: 0.81–0.95).

CONCLUSIONS
These RESULTS indicate that oral frailty is associated with reduced appetite and food diversity. They also suggest that these associations may lead to malnutrition and progression of frailty.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_091

COMPARISON OF MUSCLE MASS MEASURED BY CT AND BIOELECTRICAL IMPEDANCE ANALYSIS IN CHINESE PATIENTS WITH GASTRIC CANCER: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
Muscle mass reduction highly representing sarcopenia is an independent risk factor for poor prognosis of cancer, which is mainly assessed by CT scan as the gold standard. Bioelectrical impedance analysis (BIA) is radiation free and simple approach to evaluate muscle mass. However, accuracy of BIA in evaluating muscle mass and diagnosing muscle reduction is unclarified. Moreover, the cutoff value of BIA for indicating sarcopenia risk in Chinese gastric cancer population remains unclear. The aim of the present study was to investigate the accuracy of BIA in muscle evaluating and to identify the cutoff value of diagnosing muscle reduction in Chinese gastric cancer population.

METHODS
A total of 163 gastric cancer patients were consecutively enrolled. CT scan was utilized to measure skeletal muscle mass at L3 slice. Muscle mass was also evaluated by BIA method. The correlations of muscle mass between CT and BIA methods were assessed. Data consistency was analyzed by intraclass correlation coefficient (ICC). The optimal cut-off value of skeletal muscle mass was obtained by receiver operating characteristic curve (ROC) to diagnose muscle reduction.

RESULTS
There were 44 females and 119 males enrolled. The mean skeletal muscle mass measured by CT and BIA were 118.81±24.54 cm2 and 25.11±4.37 kg in overall patients, respectively. The mean SMI measured by BIA was 9.42±1.09 kg/m2. Skeletal muscle mass index (SMI) by CT was significantly correlated with that measured by BIA ($r=0.727$, $p<0.001$). The ICC between two methods was 0.903, indicating an excellent consistency. The sex-specific best cut-off values of SMI obtained by BIA were 9.46 kg/m2 in men and 8.72 kg/m2 in women in Chinese gastric cancer population, respectively.

CONCLUSIONS
Muscle mass assessed by BIA showed highly correlation and satisfactory consistency with that measured by CT scan. The best cut-off values of for SMI indicating sarcopenia risk in Chinese gastric cancer population obtained from BIA were 9.46 kg/m2 in males and 8.72 kg/m2 in females, respectively.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_093

DEVELOPMENT OF A FOOD COMPOSITION DATABASE TO ASSESS THE DIETARY INTAKE OF PLANT BIOACTIVES

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BACKGROUND AND OBJECTIVES

Increasing evidence shows how plant-based diets can exert beneficial health effects, particularly on the prevention of chronic diseases. (Poly)phenols and carotenoids are the most studied phytochemicals, but many others, such as phytosterols, glucosinolates, and alkaloids, may be involved in promoting human health. However, the dietary intake of these bioactive molecules remains difficult to assess, due to the lack of phytochemical food composition databases (FCDs). The aim of this work was filling this gap by developing a FCD, named PhytoFooD (Phytochemical Food Database), covering the main dietary phytochemicals. The most relevant compounds from the four main phytochemical classes were considered: (poly)phenols, terpenoids, *N*-containing compounds, and miscellaneous phytochemicals.

METHODS

Twelve online international FCDs (i.e. FNDDS, eBASIS, Phenol-Explorer, etc.) were used to collect information about the concentration of these molecules in foods. Foods from all international FCDs were matched to the Italian database BDA, which served as reference FCD, based on food name and macronutrient concentrations. Then, phytochemical concentrations reported for each single FCD were included into our database. A literature search on Scopus was conducted for the collection of additional data. Different inclusion/exclusion criteria were set to guarantee data quality. Once all data were collected, three statistical tests were used to verify the presence of outliers. Central and deviation measures, as well as a quality index of the final data were calculated for each food and compound.

RESULTS

Data for more than 800 phytochemicals in about 600 different foods were collected. Fourteen phytochemical subclasses, including (poly)phenols and *N*-containing compounds (alkaloids, glucosinolates, etc.), have been developed, while the remaining families (terpenes and miscellaneous) will be developed in the coming months.

CONCLUSIONS

The lack of phytochemical FCDs is still an issue that needs to be addressed to properly estimate the intake of these bioactives in human populations, to achieve a more comprehensive and detailed view of different dietary patterns and their potential impact on human health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_095

THE CROSSLINK AMONG INFLAMMATION, OXIDATIVE STRESS AND INTESTINAL MICROBIOTA IN PREGNANCY-RELATED COMPLICATIONS

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BACKGROUND AND OBJECTIVES
Pregnancy is a complex and continuously changing physiological process. With the increase in gestational age, a series of physiological changes, including hormone, metabolism, and immune, lead to the microbiota shift of pregnant women. Growing studies have shown that the dysbiosis of microorganisms is closely related to adverse pregnancy complications.

METHODS
We determined and compared the gut microbiota communities in the feces of gestational diabetes mellitus (GDM), Autoimmune diseases (AD), pregnancy-induced hypertension (PIH), and Hyperlipidemia (HPL) with healthy pregnant women using 16S rRNA gene sequencing and then investigated the relationships among gut microbiota, cytokines, and the four pregnancy complications.

RESULTS
Compared with the healthy pregnant group, microbial α diversity was increased in the GDM group while β diversity was decreased in the PIH group. At the phylum level, the abundance of *Bacteroidetes* was increased, while the abundance of Actinobacteria was decreased in GDM, AD, PIH, and HPL groups. T-test analysis found 28 differentially abundant taxa among the five groups. The pro-inflammatory cytokines in GDM, AD, PIH, and HPL serum were higher than in the control group. In addition to alterations in gut microbiota composition, we also found that *Lachnospiraceae_ND3007_group*, *Coxiella*, *Chloroplast*, *Mitochondria*, and *Bacteroides* were positively correlated with glycemic indicators and proinflammatory cytokine. Meanwhile, *Faecalibacterium*, *RF39*, *Clostridia_UCG-014*, *Ruminococcus*, and *Sellimonas* had negative correlations with HbA1c and FBG. Several genera, including *Faecalibacterium*, *Bifidobacterium*, *Dialister*, *Agathobacter*, and *Escherichia-Shigella* showed a significant and positive association with anti-inflammatory cytokines.

CONCLUSIONS
Overall, the human gut microbiome was involved in various pathophysiological pathways closely related to the pathogenesis of pregnancy complications, including inflammatory responses, and glucose and lipid metabolism. The gut microbiota may represent a potential noninvasive diagnostic and therapeutic strategy for pregnancy complications. Our study will expand the knowledge of maternal and infant health from the gut microbiota perspective, aiding in developing new preventive and therapeutic strategies for pregnancy complications based on intestinal microecology.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_096

GENETIC POLYMORPHISM OF METHYLENE TETRAHYDROFOLATE REDUCTASE C677T MODIFIES DIETARY AND BLOOD BIOMARKERS OF METHYL DONOR NUTRIENTS TO PREDICT BLOOD PTAU AS TO COGNITION DYSFUNCTION IN THE TAIWANESE COHORT STUDY OF ALZHEIMER PREVENTION

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BACKGROUND AND OBJECTIVES

Genetic polymorphism of *methylene-tetrahydrofolate reductase (MTHFR)* at C677T locus modifies one-carbon metabolic flow to result in elevated blood homocysteine (Hcy) associated with increased Alzheimer's disease (AD) risks. Recent advances document blood pTau217 as the surrogate biomarker to predict risk of Alzheimer's AD-associated cognition dysfunction. Relationship between *MTHFR C677T* , dietary and blood biomarkers of methyl donor nutrients as to blood pTau and cognition dysfunction is unexplored.

METHODS

To test the hypothesis, this study recruited a total of 197 individuals including controls, SCD, MCI and AD from NTUH and FJH hospitals. Each patient underwent a Mini-Mental State Examination (MMSE) evaluated by a neurologist and had their plasma pTau tested through blood sampling. Germ line genetic polymorphisms of MTHFR C677T and APOE ε4 allele were genotyped in lymphocytes. Additionally, semi-quantitative food frequency questionnaires (FFQ) were collected to assess dietary one-carbon nutrient intake.

RESULTS

MTHFR C677T genotypes were assoiated with TMAO levels. For MTHFR CT/TT variants, energy-adjusted total choline levels were significantly and inversely associated with pTau levels (beta: -2.35, p = 0.01), whereas energy-adjusted free choline and phCH were positively and significantly associated with ptau levels. (beta: 1.85 and 1.91, respectively). Entering phosphocholine overrides total choline and its derivatives intakes effect to predict pTau variation (beta: -0.47, p = .05). Entrance of plasma Hcy and TMAO negated, whereas entrance of plasma methyl-donors status strengthen PhCH (beta: -.52, p = 0.02) prediction power for pTau variation. Entrance of energy-adjusted folate negated total choline intake prediction power on pTau levels (beta: .64, p = .03), whereas entrance of plasma TMAO and Hcy negated not only folate intake but also BMI/education prediction power for pTau. Interestingly, the relationship between dietary, blood markers, and pTau prediction was wiped out in individuals with MTHFR CC genotype.

CONCLUSIONS

The data suggest that the relationship between Pcho intake and ptau levels may be mediated by cellular one-carbon metabolism and SNP.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_097

A NOVEL METHOD FOR ASSESSING ZINC CONCENTRATIONS OF FINGERNAIL CLIPPINGS OF PRESCHOOL-AGED CHILDREN IN PUNJAB, INDIA

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BACKGROUND AND OBJECTIVES

The risk of zinc deficiency is high among preschool-aged children (PSC) in many low- and middle-income settings. Data on zinc status are needed to guide the design and evaluation of interventions to improve zinc nutrition but are often limited. Technical, logistical, and financial constraints contribute to the dearth of high-quality plasma/serum zinc (PZC) data. A new portable X-ray fluorescence technique (XRF) has been developed to measure nail zinc concentrations (NZC). The current study aimed to compare the new XRF technique for measuring NZC against the reference, Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES) method.

METHODS

The current study involved a sub-sample (n=54) of PSC enrolled in a trial of multiply-fortified salt in Punjab, India. Fingernail clippings were collected at enrollment using sterilized child safety clippers. To remove environmental contaminants, nail clippings were manually scraped with a ceramic blade to remove debris. Then, the nail samples underwent sonication in 0.5 ml of 5% Triton X-100 for 10 min, followed by 3 cycles of vortexing in 1ml of OmniTrace water for 10 sec, and were dried at 60°C for 12-18 h. NZC in the samples were determined non-destructively using the portable XRF system, followed by ICP-OES analysis. The association between NZC measured with XRF vs ICP-OES was investigated using Spearman correlational analysis and Bland Altman plots.

RESULTS

Mean ± SD child age was 36.7±13.2 months. The prevalence of child stunting was 7.4%. NZC using XRF was 88.6 ± 17.3 ug/g and the corresponding NZC using ICP-OES was 110.8 ± 18.5 ug/g. The correlation between NZC measured with XRF vs. ICP-OES was strong ($\rho = 0.71$; $p < 0.0001$). The mean difference ± SD [lower limit of agreement, upper limit of agreement] between XRF and ICP-OES for NZC was -22.2 ± 13.5 [-48.7, 4.2] ug/g. The RESULTS of the association between NZC and serum zinc are forthcoming.

CONCLUSIONS

The strong and positive correlation between NZC using XRF vs ICP-OES is promising and shows that the XRF can be used to measure NZC in PSC. Though NZC cut-offs for zinc deficiency have not been established yet, the lack of agreement between the two methods suggests the XRF method may not be useful for assessing zinc deficiency at the population level. Further analysis will evaluate the correlation and agreement between NZC using XRF and ICP-OES and PZC, which is the recommended biomarker for measuring zinc status in PSC.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_099

ALTERED CHOLINE INTAKES ARE ASSOCIATED WITH COGNITIVE DYSFUNCTION AND GUT MICROBIOTA DYSBIOSIS: A PILOT STUDY IN NUTRITION AND ALZHEIMER'S DISEASES PREVENTION

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BACKGROUND AND OBJECTIVES
Preclinical studies have documented the effects of choline intake, as metabolized by gut microbiota, on the production of Trimethylamine-N-Oxide (TMAO), homocysteine levels, and markers of cognitive dysfunction. However, human studies remain limited. The study aims to investigate if altered choline intakes are associated with cognition dysfunctional markers and gut microbiota dysbiosis and the working mechanism.

METHODS
Subjects were grouped into Control (N=19), Subjective Cognitive Decline (SCD, N=13), and Cognitive Decline (CD, N=21). Each subject underwent Mini-Mental State Examination (MMSE), Clinical Dementia Rating (CDR), and semi-quantitative Food Frequency Questionnaires (FFQ), and plasma analysis of pTau, TMAO, and homocysteine (HCY). Gut microbiota were analyzed using Kinnex 16S rRNA kit and MicrobiomeAnalyst 2.0. Associations between CD biomarkers and the fecal microbiome were assessed by LASSO regression of standardized, centered log-ratio transformed genera in R 4.3.1.

RESULTS
We stratified participants by adequate choline intake (adult Female: 400 mg, Male: 450 mg) into high and low intake groups. The microbial diversity of the control group was distinctively different from the SCD and CD groups. In the control group, *Blautia_A* negatively correlated with cognitive decline, CDR, and TMAO (Coefficient: -8.79E-06) but positively with HCY (Coefficient: 0.01) under high choline intake. *Anaerostipes* also showed a negative association with TMAO under high choline intake (Coefficient: -0.0002). *Fusobacterium_A_varium* was enriched in the SCD group (high choline) and the CD group (low choline) but positively correlated with CDR (Coefficient: 0.1) only under low choline intake. In the CD group, *Parabacteroides_merdae* correlated with disease progression, Ptau, and negatively with MMSE. It was negatively associated with HCY (Coefficient: -0.01) under high choline intake but positively with CDR under low choline intake. *Anaerobutyricum hallii* positively correlated with HCY (Coefficient: 0.02) only under low choline intake. Choline intake modulated the gut microbiota's effects on HCY and cognitive decline. However, microbiota in the control group may utilize choline through distinct pathways, reducing TMAO while increasing HCY.

CONCLUSIONS
Our data revealed that the microbiota stability of the control group was independent of choline intake. Microbiota dysbiosis of the CD group was associated with cognitive dysfunctional markers, which could be modified by dietary choline intake.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_100

THE EFFECT OF MEDIUM-CHAIN FATTY ACIDS OR MEDIUM-CHAIN TRIGLYCERIDES ON GLYCAEMIC CONTROL: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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BACKGROUND AND OBJECTIVES
Intake of dietary long-chain triacylglycerols (LCTs) with medium-chain fatty acids (MCFAs) or medium-chain triacylglycerols (MCTs) may have mixed effects on cardiometabolic health, with some evidence suggesting they can modestly reduce body weight and composition without adversely affecting lipid profiles. However, the effects of MCFAs and MCTs on glycaemic biomarkers remain poorly understood. Therefore, we conducted a systematic review and meta-analysis to evaluate the impact of dietary intake or supplementation of MCFAs and MCTs on glycaemic parameters in adults.

METHODS
A systematic search was conducted in four databases from inception up to 30 June 2024. RCTs investigating the effect of MCFAs or MCTs on fasting blood glucose (FBG), hemoglobin A1c (HbA1c), fasting insulin, and HOMA-IR compared to a control group were included. Records were excluded when studies reported the effect of co-interventions, conducted on pregnant women, children, or adolescents. Summary mean differences and corresponding 95% confidence intervals were calculated using a random-effects model.

RESULTS
Overall, 18 publications with 22 effect sizes were included in the meta-analyses, focusing on healthy individuals (n = 9), type 2 diabetes (n = 2), obesity (n = 2), and other conditions like cancer, mild cognitive impairment, or hypertriglyceridemia (n = 5). The mean age of the trial participants ranged from 20 to 75 years. Two studies used MCFAs, while the rest employed MCT oil or MCT-based formulas, with intervention durations ranging from 4 days to 24 weeks. Participants in the control groups mostly consumed long-chain fatty acids (n=13), while others receiving placebo (n=4) or low doses of MCTs (n=1). Most RCTs included both men and women, except for three that included only men and one only woman.The overall RESULTS indicated no improvement in FBG (MD = 0.02 mg/dL; 95% CI: -1.59, 1.62; n = 22; I2=83%), HbA1c (MD = -0.3%; 95% CI: -0.17, 0.11; n = 5; I2=31%), or HOMA-IR (MD = 0.06 units; 95% CI: -0.39, 0.51; n = 5; I2=42%), but a small reduction in fasting insulin levels (MD = -0.42 μU/L; 95% CI: -0.81, -0.02; n=12; I2=84 %) in the MCTs group compared to the control group.

CONCLUSIONS
Our findings suggest that MCFA and MCT supplementation may have no effect on glycaemic control, and reductions in fasting insulin levels were minimal. Further research could focus on identifying specific subpopulations or conditions where MCTs and MCFA might have a more pronounced effect.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_101

MEAL TIMING AND LAST MEAL TIME RELATES TO METABOLIC PARAMETERS IN HEALTHCARE ROTATING NIGHT SHIFT WORKERS

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BACKGROUND AND OBJECTIVES

Optimal functioning of the circadian system is of paramount importance to achieve proper health. A circadian disruption occurs when sleep-wake and eating-fasting rhythms are not aligned with the light-dark cycle. One of the main circadian disruptors comprises shift work, which alters physiological processes such as digestion, energy expenditure, blood pressure, and overall metabolism. Shift work alters eating patterns and typical eating window (time elapsed between the first and last meal of the day) time. We aimed to evaluate the eating timing and eating window length associated with metabolic parameters in rotating night shift workers (NSW).

METHODS

Were studied fifty-five adults, between 18 and 65 years old, before recruitment in a randomized trial assessing the circadian and metabolic effects of restricting daily eating time. In a clinical evaluation, weight, height, waist and neck circumference, blood pressure, and heart rate were evaluated. A fasting blood sample was used to measure glycemia, insulin, blood lipids, and ultra-sensitive c-reactive protein (usCRP) levels. The type and timing of each meal and eating window duration were evaluated through a 24-hour recall survey. Based on the mean timing of the last meal of those with full dataset, we compared those participants with (n=18, Early-Last, EL) and without (n=26, Late-Last, LL) food intake after 21:00h.

RESULTS

Participants were young adults (34.8 ± 8.9 years), primarily female (96% F), with a mean BMI (29.6 ± 4.5 kg/m2), 50.0% having obesity. The mean eating window was 12.2 ± 2.1 h/day, and the last meal averaged 21.4 ± 1.8 h. Eating window and meal frequency were higher in the LL group (both $p<0.001$). The time of the last meal, excluding breakfast and lunchtime was associated with higher glycemia levels (rho, 0.42, $p=0.011$). Both EL and LL groups had similar anthropometrics, vitals, serum glucose and insulin, and HOMA-IR. However, LDL-cholesterol ($p=0.043$) was lower, and usCRP level tended to be higher ($p=0.054$) in the LL group.

CONCLUSIONS

The eating window and meal frequency were higher in those with food intake after 21:00h. The late timing of the last meal relates to increased glycemia, blood lipids, and inflammation status in healthcare NSW. Further research should evaluate the circadian and metabolic effects of modifying the eating window duration in this group.

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CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_102

USE OF METABOTYPING TO IDENTIFY INDIVIDUALS WITH DIFFERENT TRIGLYCERIDES RESPONSE CURVES AFTER INTAKE OF HIGH FAT MEALS

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BACKGROUND AND OBJECTIVES

Metabotyping is a novel concept in precision nutrition that groups people based on their shared metabolic characteristics. However, most studies use data from a single meal for metabotyping. We have previously performed a randomized controlled cross-over meal study with four different high fat meals with similar fat content from different dairy products (Hansson et al., 2019). We observed a large variation in individual triglyceride (TG) response, and in this current project, we aim to identify different groups of triglyceride responders and define their metabolic and biological profile.

METHODS

Forty-seven healthy adults (fourteen males) aged 25-46 y with BMI 21.0-25.8 kg/m2 were included for analysis. Metabolic parameters were measured before intake of each of the four meals and at 2, 4, 6h postprandially. Lipoprotein subclasses were measured using nuclear magnetic resonance. The incremental area under the curve (iAUC) was calculated for metabolic parameters and lipoprotein subclasses.

A latent class mixed model was applied to analyse the data. This method identifies subgroups in the population by modelling both the trajectory over time and the effect of different meals, while allowing for individual variability.

RESULTS

Four different subgroups (clusters) were identified. Since one cluster included only two subjects, we continued with three clusters (n = 45). Cluster 1 (n = 18) displayed low TG response to the meals, cluster 2 (n = 21) had the highest TG peak at 2h and returned to baseline at 6h, and cluster 3 (n = 6) had a continuous high TG level after 2h. Significant differences ($p < 0.05$) between the clusters were found for sex, fat mass, and visceral adipose tissue (VAT); cluster 3 had significantly higher mean VAT than cluster 1. Regarding other biochemical parameters, glucose-iAUC and GlycA-iAUC showed significant differences between the clusters, with the largest GlycA-iAUC in cluster 3.

CONCLUSIONS

This work revealed three response groups based on dynamic postprandial TG changes. The latent class mixed model was able to accommodate different types of data and took the meal differences into account. Since the model assigned a probability to each cluster, the repeated measures increased the reliability of clustering RESULTS. This approach holds a potential to be used for detecting metabolic dysfunctions, and it aids in delivering personalised nutritional interventions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_103

FOOD AVOIDANCE IN ANOREXIA NERVOSA:AN EXPERIMENTAL PARADIGM ASSOCIATING GAZE MONITORING DURING PREFERENCE FOOD EVALUATIONS TASKS AND THE WILLINGNESS TO EAT WITH DIFFERENT CALORIC VALUE

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BACKGROUND AND OBJECTIVES
Anorexia Nervosa (AN) is a severe psychiatric disorder characterized by excessive food restriction and avoidance of high-calorie and high-fat foods, stemming from an intense fear of weight gain. These maladaptive behaviors reflect a conflict between the "willingness-to-eat" and the fear of negative outcomes associated with eating. Such behaviors often lead to poor nutritional intake, exacerbating health risks. While avoidance of nutrient-rich foods is a hallmark of AN, the underlying cognitive and emotional mechanisms driving these maladaptive decisions remain poorly understood.

METHODS
This study involved 67 patients with anorexia nervosa and 37 healthy controls. AN patients were subdivided for several analysis in two groups: those with restrictive form (AN-R, n=30) and those combining both restrictive and bulimic behaviors (AN-B, n=37). We developed an experimental paradigm to investigate the link between these cognitive disturbances by monitoring gaze (eye tracking) during three tasks aimed at evaluating the health, taste and preference values of food pics divided in three categories according to their caloric content: hypo- intermediate and hyper-caloric foods. Moreover, we evaluated the reject rate and quantity wanted of each food item to compose their meal.

RESULTS
Both patient’s subgroups showed significant attentional avoidance of high-calorie food stimuli, characterized by reduced fixation durations compared to controls ($p < 0.01$). Gaze patterns predicted decision-making, with longer fixation durations on selected food items significantly correlating with participants' eventual acceptance of those items, while shorter fixation durations were associated with food items that were ultimately rejected ($p < 0.001$). Intermediate foods were more likely to be “accepted” over high-calorie items ($p < 0.001$) but avoided when compared to low-calorie options ($p < 0.001$). In the willingness-to-eat task, AN-B patients exhibited heightened stress and greater fixation on avoidance areas compared to AN-R ($p < 0.001$).

CONCLUSIONS
Crucially, our findings reveal that while food avoidance in AN is primarily visual, actual food choices are strongly influenced by contextual comparisons. Patients consistently preferred lower-calorie options, with AN-B patients showing greater challenges in decision-making. Individual responses varied. This personalized understanding of food acceptance and avoidance offers promising opportunities for targeted therapeutic strategies aimed at gradually reintroducing and revaluing nutrient-dense foods in the treatment of AN.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_104

USING COMPUTED TOMOGRAPHY (CT) AND THE GLOBAL LEADERSHIP INITIATIVE ON MALNUTRITION (GLIM) TO PREDICT SURVIVAL IN CURATIVE AND ADVANCED CANCER PATIENTS

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BACKGROUND AND OBJECTIVES
Despite debilitating consequences, cancer-associated malnutrition is underdetected due to the lack of a standardised diagnosis. The GLIM criteria were established in 2018 in order to standardise the diagnosis of malnutrition. The aim of this study was to determine the association between GLIM-diagnosed malnutrition and overall survival in a large cohort of patients with mixed-cancer types. This is the first study to stratify patients according to treatment intent (curative, active palliative vs. supportive care only) and is one of the largest studies to identify reduced muscle mass using CT analysis of body composition.

METHODS
Patients receiving anti-cancer treatment for solid tumours were enrolled in a cross-sectional study to examine nutritional status between 2011-2016. The GLIM criteria was retrospectively applied. CT images at the third lumbar vertebrae (L3) were used to quantify skeletal muscle index and categorised according to previously published cut-points. Survival analysis was carried out using Kaplan-Meier curves and Cox-Regression.

RESULTS
Of 1405 patients, 53% were male. Mean(SD) age was 62(12) years, 45% were gastrointestinal cancers and 60% had metastases. In total, 40% were diagnosed with GLIM-malnutrition (15% had stage 1 moderate and 26% had stage 2 severe malnutrition). Median follow-up was 102 months (95% CI: 100-105 months). Median survival for those without malnutrition was 30 months (95% CI 24–37 months), versus 11 months (95% CI 7 – 15 months, $p<0.001$) for stage 1 moderate and 10 months (95% CI 8–12 months $p<0.001$) for stage 2 severe malnutrition. Multivariate analysis (controlling for gender, age, cancer site, Eastern Cooperative Oncology Group performance score and treatment intent) demonstrated poorer overall survival [HR: 1.504 (95% CI 1.238–1.820), p<0.001] in stage 1 moderate malnutrition and HR:1.565 (1.345–1.828, p<0.001) for stage 2 severe malnutrition. Stage 2 severe malnutrition was significantly more prevalent in the supportive care cohort (33%) when compared to patients being treated with curative intent (18%, $p=0.004$).

CONCLUSIONS
This study is one of the largest studies to date which uses CT analysis to accurately identify reduced muscle mass and confirms that the GLIM criteria can be used to predict overall survival in a large mixed-cancer cohort. These findings suggest that malnutrition, regardless of GLIM severity ranking has a significant impact on overall survival. Future research should focus on determining oncology specific cut-points for the GLIM criteria.

CONFLICTS OF INTERESTS
ESS has received Conference attendance support from the Nutrition Society, Honoraria from Complete Nutrition & MedMedia and Grant support from the Irish Research Council and Nualtra Ltd.; has Project managed contract research funded by Danone Nutricia Research and is a member of the management committee of IrSPEN and CPD Lead for the Cancer Nutrition Network of the Irish Nutrition & Dietetic Institute

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EPO7_105

INVESTIGATING THE USE OF BIOLOGICALLY-BASED COMPLEMENTARY AND ALTERNATIVE MEDICINE (BBCAM) IN PEOPLE LIVING WITH AND BEYOND CANCER IN IRELAND

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BACKGROUND AND OBJECTIVES

Biologically-based complementary and alternative medicine (BBCAM) use is common among cancer survivors. BBCAM can interact with conventional treatments, and unregulated products may cause harm. This study aimed to determine the prevalence, types, and motivations for BBCAM use among cancer survivors.

METHODS

An online survey assessed clinical characteristics and CAM use in participants >18yrs who had received cancer treatment in Ireland from 2018-2022. The survey was widely advertised in clinical settings and online through charity organisations. The survey was completed anonymously on Castor EDC. The National Center for Complementary and Integrative Health definitions were used, and examples of BBCAM were given to participants before questions were posed about their use. These examples included vitamin/mineral supplements not prescribed by a dietitian or doctor, herbal remedies, alternative diets, food supplements and various pseudomedicines. BBCAM use was characterised both pre-diagnosis and post-diagnosis. Perceived safety, reasons for use and possible risks and benefits were explored. Analyses were carried out in SPSS. Chi-square tests and Bonferroni corrections for multiple testing were applied to determine differences between groups in BBCAM use.

RESULTS

Amongst 295 respondents (77% female, mean age 53 years), BBCAM use increased from 28% pre-diagnosis to 34% post-diagnosis ($p<0.001$). For BBCAM users (n=97, 33%), 'daily-use' increased from 38% to 72% ($p<0.001$) post diagnosis. Common types included: mineral/vitamin supplements (84%), dietary supplements (e.g. turmeric, coenzyme-Q10) (78%), herbal remedies/botanicals (e.g. mistletoe, St. John's Wort, echinacea, ginseng) (50%), cannabis (21%), and other natural products (laetrile, shark cartilage, apricot kernels) (19%). Biological medicines (GcMAF, immuno-augmentative therapy) were used by 12% of BBCAM users. Special diets including dairy free (32%), gluten-free (19%), intermittent fasting (17%), ketogenic diet (15%), juicing/detox (10%) were also common. Perceived benefits included: improved well-being (63%) and reduced psychological stress (59%).

CONCLUSIONS

BBCAM use increases after a cancer diagnosis. Patient perceived benefits highlight potential gaps in the current healthcare model, indicating a need for greater emphasis on safe survivorship care. Healthcare professionals should ask people living with and beyond cancer about their use of BBCAM and explore unmet needs, such as poorly controlled symptoms.

CONFLICTS OF INTERESTS

ESS has received Conference attendance support from the Nutrition Society, Honoraria from Complete Nutrition & MedMedia and Grant support from the Irish Research Council and Nualtra Ltd.; has Project managed contract research funded by Danone Nutricia Research and is a member of the management committee of IrSPEN and CPD Lead for the Cancer Nutrition Network of the Irish Nutrition & Dietetic InstituteThis study was funded by the Irish Cancer Society research grant ASTA19RYA. Further funding was made available via Call IV of the HEA COVID Fund.

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EPO7_108

ASSOCIATION OF CIRCULATING METABOLITES WITH GENETIC RISK, LIFESTYLE, AND FAMILY HISTORY OF DIABETES

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BACKGROUND AND OBJECTIVES
Previous studies have shown that family history of diabetes, genetic predisposition, and lifestyle factors independently influence the risk of developing diabetes (1-3). Although these factors help stratify diabetes risk, the underlying mechanisms remain unclear, posing challenges for personalized prevention. Metabolomic profiling may reveal novel pathways by exploring differences associated with genetic, lifestyle, and familial risks. This study aims to identify metabolite differences linked to family history, genetic risk, and lifestyle factors.

METHODS
We analyzed data from 12,461 diabetes-free Japanese individuals aged 20 years or older. Lifestyle scores, incorporating body mass index, smoking, physical activity, and gamma-glutamyl transferase (a marker of alcohol consumption), categorized participants into ideal, intermediate, or poor lifestyle groups (2). We constructed a polygenic risk score (PRS) based on type 2 diabetes loci from the BioBank Japan study (4) and combined family history, PRS tertiles, and lifestyle risk to form 18 groups. Plasma metabolites were quantified using NMR spectroscopy. First, we evaluated the relationship between family history, PRS, and lifestyle risk on diabetes development using Poisson regression models with robust variance correction to calculate relative risk (RR) and 95% confidence intervals (CIs). Second, we examined differences in metabolites across the 18 groups using multiple linear regression models.

RESULTS
Over a median follow-up of 4.3 years, 354 participants developed diabetes. Compared to individuals with no family history, low PRS, and an ideal lifestyle, high PRS increased diabetes risk even in those with no family history and an ideal lifestyle (RR, 3.49; 95% CI, 1.62–7.54). Similarly, a family history increased diabetes risk even among participants with low PRS and an ideal lifestyle (RR, 2.28; 95% CI, 1.08–4.84). Compared to individuals with no family history, low PRS, and an ideal lifestyle, Participants with no family history, an ideal lifestyle, and high PRS had significantly elevated levels of 11 metabolites, including isoleucine, creatine, ornithine, and glucose. Meanwhile, those with an ideal lifestyle, low PRS, and a family history showed elevated levels of 13 metabolites including histidine, threonine, arginine, and proline.

CONCLUSIONS
Several metabolites may serve as targets for diabetes prevention interventions tailored to an individual's genetic and lifestyle profile.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_110

SAFETY, TOLERABILITY AND WEIGHT REDUCTION FINDINGS OF ORAL AMYCRETIN: A NOVEL AMYLIN AND GLUCAGON-LIKE PEPTIDE-1 RECEPTOR CO-AGONIST, IN A FIRST-IN-HUMAN STUDY

Vanessa Folope Leborgne[1]; Agnes Gasiorek[2]; Arne Heydorn[2]; Katrine Kirkeby[2]; Cassandra Key[3]; Soren Toubro[2]; Line Hollesen Schefe[2]; Kirsten Dahl[2]; Julie B. Hjerpsted[2]; Andreas Vegge[2]
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BACKGROUND AND OBJECTIVES
Obesity is a major global health burden with limited treatment options. Amidst investigations into the potential synergy beyond glucagon-like peptide-1 receptor agonists (GLP-1RAs), the combined efficacy of the amylin analogue cagrilintide and the GLP-1RA semaglutide is being explored as a subcutaneous treatment solution. This study introduces amycretin, a novel protein-based unimolecular amylin and GLP-1 receptor co-agonist for once-daily oral administration. The aim of this first-in-human study was to investigate the safety, tolerability, pharmacokinetics and weight loss effects of single and multiple oral doses of amycretin in participants with overweight or obesity.

METHODS
In this first-in-human, single-centre, placebo-controlled, double-blinded study (NCT05369390), participants with a BMI of 25.0–39.9 kg/m2 without diabetes were randomised to receive once-daily oral amycretin (n=95) or placebo (n=29). The study consisted of three parts: single-ascending dose (Part A, 1–25 mg), 10-day multiple-ascending dose (Part B, 3–12 mg) and 12-week multiple-ascending dose (Part C, 3–2×50 mg) parts. The primary endpoint was the number of treatment-emergent adverse events (AEs), while secondary endpoints included AUC and Cmax for plasma amycretin. Change in body weight from baseline was evaluated as a key exploratory endpoint.

RESULTS
At week 12, the mean change in body weight (amycretin 50 mg, –10.4% [SD, 4.6]; amycretin 2×50 mg, –13.1% [SD, 4.8]) was significantly greater with oral amycretin versus placebo (–1.1% [SD, 2.6]; $p<0.0001$ for both doses) (Fig. 1). The majority of AEs reported were mild to moderate in severity and related to gastrointestinal discomfort (i.e. nausea and vomiting), and decreased appetite. These AEs occurred in a dose-proportional manner, with low tolerability for dose levels ≥18 mg when amycretin was administered as a single dose and ≥12 mg when administered for 10 consecutive days. However, by introducing stepwise dose escalation, all tested dose levels up to and including 2×50 mg had acceptable safety and tolerability profiles.

CONCLUSIONS
Daily oral amycretin treatment in adult participants with overweight or obesity and without diabetes demonstrated acceptable safety and tolerability profiles and led to remarkable reductions in body weight over only 12 weeks. The lack of weight loss plateauing indicates the possibility of achieving further weight reductions with extended treatment. The RESULTS underscore the promising potential of amycretin as an anti-obesity medication.

CONFLICTS OF INTERESTS
Agnes Gasiorek: Novo Nordisk employeeArne Heydorn: Novo Nordisk employeeKatrine Kirkeby: Novo Nordisk employeeAndreas Vegge:Novo Nordisk employeeJulie B. Hjerpsted: Novo Nordisk employeeKirsten Dahl: Novo Nordisk employeeLine Hollesen Schefe: Novo Nordisk employeeSoren Toubro: Novo Nordisk employeeCassandra Key: worked on this study with Novo NordiskVanessa Folope Leborgne: Novo Nordisk employee

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EPO7_111

ORAL SEMAGLUTIDE 50 MG ONCE DAILY IMPROVES PHYSICAL FUNCTIONING IN THE OASIS 1 TRIAL

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BACKGROUND AND OBJECTIVES
In OASIS 1, the estimated mean percentage body weight change from baseline to week 68 was –15.1% with once-daily oral semaglutide 50 mg and –2.4% with placebo; comparable to weight loss with once-weekly subcutaneous semaglutide 2.4 mg. In this analysis, the impact of semaglutide vs placebo on physical functioning (PF) was evaluated based on patient-reported data from the Impact of Weight on Quality of Life-Lite Clinical Trials Version (IWQOL-Lite-CT) and Short Form-36v2 Health Survey acute version (SF-36v2) instruments.

METHODS
In the OASIS 1 trial (NCT05035095), 667 adults with overweight or obesity were randomized 1:1 to semaglutide or placebo, plus lifestyle intervention. Changes from baseline to week 68 in the PF domains of the IWQOL-Lite-CT and SF-36v2 were assessed by analysis of covariance for the treatment policy estimand for all participants and for a subgroup with poor baseline PF (n=88; 13.2%) (defined as participants who responded “Poor” on PF of the Patient Global Impression of Severity questionnaire). The number of participants achieving a meaningful within-person improvement in PF in IWQOL-Lite-CT (≥14.6 points), and SF-36v2 (≥3.7 points) were also assessed. Anchor-based methods were used to derive these cut-off scores.

RESULTS
Significantly greater improvements from baseline to week 68 with semaglutide vs placebo in the IWQOL-Lite-CT PF score were observed for all participants (estimated treatment difference [ETD] 10.5 points, 95% confidence interval [CI] 7.5, 13.6) and for participants with poor baseline PF (ETD 14.4 points, 95% CI 4.4, 24.4). Similar RESULTS were observed in the SF-36v2 PF score (all participants, ETD 2.3 points, 95% CI 1.4, 3.2; participants with poor baseline PF, ETD 4.2 points, 95% CI 0.9, 7.5). Semaglutide-treated participants were more likely to achieve meaningful improvement in PF at week 68 vs placebo in the IWQOL-Lite-CT (50% vs 31%, odds ratio [OR] 2.8, 95% CI 1.9, 4.1) and in the SF-36v2 (37% vs 20%, OR 2.9, 95% CI 1.9, 4.5). Greater categorical weight loss was associated with greater improvements in PF in both instruments (data not shown).

CONCLUSIONS
Once-daily oral semaglutide 50 mg provided meaningful improvement in physical functioning in participants with overweight/obesity, including those with poor physical functioning at baseline.

CONFLICTS OF INTERESTS
Novo Nordisk studyDomenica Rubino is currently a clinical investigator for Novo Nordisk, Boehringer Ingelheim, and Kallyope; received consultant/advisor fees from Novo Nordisk, Regeneron, Boehringer Ingelheim, Shionogi, Cytoki, Lilly; payment or honoraria for participating as a speaker from Novo Nordisk; CME honoraria from Prime Therapeutics, Peer View, Medscape, Endocrine Society, and ADA; travel support for speaking/presenting from Novo Nordisk, Boehringer Ingelheim, Lilly, Prime Inc., Peer View, Medscape, Endocrine Society, ADA; support for meeting registration from Endocrine Society, ADA, TOS; medical writing support from Novo Nordisk, Boehringer Ingelheim; and is a shareholder at Lilly.Thomas Holst-Hansen: Novo Nordisk employeeTobias Karlsson: Novo Nordisk employeeVanessa Folope Leborgne: Novo Nordisk

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employeeKirsi H. Pietiläinen received advisory board fees, honoraria as a speaker, and travel support for meetings from Novo Nordisk and Boehringer Ingelheim; advisory board fees and honoraria as a speaker from Eli Lilly; and research grants from the Novo Nordisk Foundation.Sean Wharton was paid as a speaker for: Academic talks for pharmaceutical industry; Novo Nordisk, Eli Lilly, Boehringer Ingelheim, Bausch Health Canada Inc. • Has worked as a paid consultant for: Contractual consultancy: Astra Zeneca, Amgen • Has received financial grants from: Pharmaceutical Trials: Novo Nordisk, Eli Lilly, Boehringer Ingelheim, Bausch Health Canada Inc.Thomas Wadden serves on advisory boards for Novo Nordisk and WW, and has received research funds (on behalf of the University of Pennsylvania) from Novo Nordisk.

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EPO7_112

PERSONALIZED HYPERTENSION RISK PREDICTION: GENETIC AND METABOLIC INSIGHTS ACROSS MENOPAUSAL STAGES

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BACKGROUND AND OBJECTIVES
Postmenopausal women face an elevated risk of hypertension due to hormonal and metabolic changes. This study aimed to develop stage-specific hypertension risk models for premenopausal and postmenopausal Korean women by integrating genetic risk scores (GRS) with metabolic markers, facilitating more precise and personalized risk prediction.

METHODS
A total of 1,246 Korean women were classified into premenopausal (n=615; normal: n=547, hypertension: n=68) and postmenopausal (n=631; normal: n=457, hypertension: n=174) groups. Genome-wide association studies identified 11 single nucleotide polymorphisms (SNPs) associated with hypertension ($P < 1\times10^{-5}$). Four SNPs formed GRS4 for premenopausal women, and three SNPs formed GRS3 for postmenopausal women. Key metabolic predictors were identified and integrated into GRS-based predictive models.

RESULTS
In premenopausal women, age, BMI, and triglycerides were identified as significant predictors of hypertension, while brachial-ankle pulse wave velocity (ba-PWV) was the sole metabolic predictor in postmenopausal women. The integrated models demonstrated strong predictive performance, with area under the curve (AUC) values of 0.811 (95% CI: 0.756–0.867, $P < 0.001$) for premenopausal women and 0.859 (95% CI: 0.795–0.923, $P < 0.001$) for postmenopausal women.

CONCLUSIONS
Predictive models incorporating GRS and metabolic markers effectively assessed hypertension risk in premenopausal and postmenopausal women. The distinct predictors across menopausal stages underscore the importance of stage-specific, tailored risk assessment approaches. These models have potential applications in preventive healthcare and patient education and may serve as a foundation for personalized health management. Further research is needed to validate these findings across diverse populations and optimize their clinical utility.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_113

MENDELIAN RANDOMIZATION STUDY ON HS-CRP AND DYSLIPIDEMIA IN KOREANS: IDENTIFICATION OF NOVEL SNP RS76400217

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BACKGROUND AND OBJECTIVES
High-sensitivity C-reactive protein (hs-CRP) is a marker of systemic inflammation and is associated with developing dyslipidemia. However, the causality between hs-CRP and dyslipidemia remains unresolved. This study aimed to investigate the relationship between hs-CRP concentrations and dyslipidemia and to explore the potential causal link using Mendelian Randomization (MR) analysis. High-sensitivity C-reactive protein (hs-CRP) is a marker of systemic inflammation and is associated with developing dyslipidemia. However, the causality between hs-CRP and dyslipidemia remains unresolved. This study aimed to investigate the relationship between hs-CRP concentrations and dyslipidemia and to explore the potential causal link using Mendelian Randomization (MR) analysis.

METHODS
A nested case-control study was conducted with 1,174 participants, and genotype data were analyzed using the Korean Chip. A genome-wide association study (GWAS) identified rs76400217 as a suitable instrumental variable (IV) due to its significant association with hs-CRP (P<10-8). Logistic regression models, adjusted for confounders, were used to evaluate the association between hs-CRP and dyslipidemia. MR analysis was performed using a two-stage least squares (2SLS) method, with rs76400217 as the IV to assess causality.

RESULTS
Logistic regression showed a significant association between hs-CRP concentrations and dyslipidemia (OR 2.08, 95% CI: 1.81-2.39, P<0.001). This association remained significant after adjusting for factors such as age, sex, alcohol consumption, and BMI. MR analysis using rs76400217 as IV confirmed strong associations with hs-CRP concentrations (P<0.001) in all models, but the causality between hs-CRP and dyslipidemia was not statistically significant.

CONCLUSIONS
Thus, no evidence of a causal relationship between hs-CRP and the risk of dyslipidemia was found in the Korean population. The strong observed association between hs-CRP and dyslipidemia may be due to other contributing factors rather than a direct cause.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_114

EFFECT OF LIRAGLUTIDE TREATMENT AFTER A HYPOCALORIC DIET ON WEIGHT LOSS MAINTENANCE: IMPACT AND ROLE OF THE INTESTINAL MICROBIOTA

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BACKGROUND AND OBJECTIVES

Background: Weight-loss interventions in obese subjects, whether dietary or surgical, lead to significant changes in the composition of the intestinal microbiota (IM)(1). The GLP-1 receptor agonist liraglutide has been shown to be effective in weight loss, particularly when combined with physical activity(2). It may also modulate the composition of the gut microbiota, a key player in metabolic homeostasis.

Objective: Our aim is to evaluate the impact of liraglutide treatment on MI composition and maintenance of hypocaloric diet-induced weight loss (VLCD), in obese, non-diabetic individuals.

METHODS

A metagenomic approach was conducted in subjects taking part in a randomized study evaluating four groups who had previously followed a VLCD diet: 1) placebo, 2) physical exercise, 3) liraglutide treatment, and 4) liraglutide treatment combined with physical exercise. Stool samples were taken before surgery, after weight loss, and after one year of treatment.

RESULTS

VLCD shows a significant impact on gut microbiota diversity and composition, similar to other nutritional intervention studies(3). Individuals with low initial IM diversity showed a significant increase in IM diversity after VLCD. There was also an improvement in MI diversity in the liraglutide-treated groups. Forty-six bacterial groups showed significant differences in abundance trajectories among the four intervention arms.

CONCLUSIONS

VLCD significantly influences MI diversity and composition, particularly in individuals with low baseline diversity. Treatment with liraglutide shows a beneficial effect on improving IM diversity in this randomized European study.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_115

RELIABILITY OF ARTIFICIAL INTELLIGENCE-BASED DIETARY INTAKE ASSESSMENT (AI-DIA) METHODS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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BACKGROUND AND OBJECTIVES
Obtaining accurate data on dietary intake in human nutrition research is a challenging process that can affect the accuracy and reliability of the data collected (1). One of the main limitations of traditional methods, such as 24-hour recall and dietary records, is that they are based on the participant's memory and are susceptible to bias and measurement error (2). Nevertheless, the advent of artificial intelligence (AI) could remedy these issues by using machine learning (ML) algorithms to reduce biases (3). The present systematic review and meta-analysis aimed to assess the reliability of AI-based dietary intake assessment methods (AI-DIA) available in the biomedical literature.

METHODS
This systematic review was designed and conducted following the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines. The protocol was registered in the Open Science Framework database (https://osf.io/gqw6s).An exhaustive search of the EMBASE, PubMed, Scopus, and Web of Science databases was conducted to identify relevant publications from inception to November 2024. Eight studies that met the inclusion criteria were included in the statistical analysis. The risk of bias was evaluated by the ROBINS-I tool.

RESULTS
Among the studies, 41.6% utilized AI techniques based on deep learning (DL) and accuracy ranged from 79% to 89.2% for nutrient estimation. In the meta-analysis, strong correlations were observed between AI-DIA estimates and traditional methods for calories (r = 0.73, 95% CI: 0.58–0.88,p <0.001), carbohydrates (r = 0.75, 95% CI: 0.62–0.87, p <0.001), protein (r = 0.71, 95% CI: 0.55–0.86,p <0.001), and fat (r = 0.73, 95% CI: 0.62–0.84,p <0.001) (https://doi.org/10.6084/m9.figshare.28131872.v1). A moderate risk of bias was noted in 58.3% of the studies, with confounding bias being the most prevalent.

CONCLUSIONS
AI-DIA methods show promising reliability and accuracy for nutritional epidemiology. However, more robust designs are needed that allow confounding and selection biases to be controlled.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_116

DEVELOPMENT OF CLINICAL NUTRITION PROBLEM DIAGNOSTIC MATRIX FOR PRECISION NUTRITION IN KOREANS WITH TYPE 2 DIABETES

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BACKGROUND AND OBJECTIVES
Precision nutrition requires identifying and addressing specific nutrition problems that impact metabolic outcomes, yet systems tailored to Korean patients with type 2 diabetes are limited. This study aimed to develop a clinical nutrition problem diagnosis matrix for precision nutrition tailored to Korean patients with type 2 diabetes and evaluate its applicability in clinical settings for accurately diagnosing nutrition problems associated with metabolic risks.

METHODS
The study was conducted in two phases. Phase 1 focused on developing the matrix by collecting standardized nutrition diagnosis terminology and identifying terms commonly used for diabetes patients in Korea. Logical connections between problems (P), etiology (E), and signs/symptoms (S) were established, and clinical nutrition experts validated the matrix. Phase 2 applied the matrix to cross-sectional data from 3,553 Korean patients with type 2 diabetes, and logistic regression was used to analyze associations between nutrition problems and metabolic risk factors, including body mass index (BMI), waist circumference (WC), fasting blood glucose (FBG), and lipid levels.

RESULTS
The validity of 31 nutrition diagnosis statements was evaluated by clinical nutrition experts using a 5-point scale, with most scoring above 4.5 and all averaging over 3.5. After excluding 12 PES statements with scores below 3, 1,606 statements remained. These were applied to cross-sectional data from 3,553 patients with type 2 diabetes. Notable associations included: inconsistent carbohydrate intake (OR=1.56, 95% CI: 1.23–1.97), inadequate fiber intake (OR=1.19, 95% CI: 1.01–1.40), and limited adherence to nutrition recommendations (OR=2.22, 95% CI: 1.07–4.59), all of which increased high BMI risk. Physical inactivity heightened the risk of high WC (OR=5.69, 95% CI: 1.25–25.93). Excessive alcohol intake (OR=2.11, 95% CI: 1.08–4.11) and food medication interaction (OR=3.10, 95% CI: 1.17–8.22) were linked to high FBG.

CONCLUSIONS
The clinical nutrition problem diagnosis matrix developed in this study demonstrated its potential as a system for identifying nutrition problems and their associations with metabolic risk factors in Korean patients with type 2 diabetes. The findings suggest that addressing specific nutrition problems through personalized dietary interventions may improve clinical outcomes.

CONFLICTS OF INTERESTS
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EPO7_119

IMPACT OF LONG-TERM FASTING ON SKELETAL MUSCLE: STRUCTURE, ENERGY METABOLISM, AND FUNCTION

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BACKGROUND AND OBJECTIVES
Fasting is a promising tool for public health, but concerns about muscle loss prevent its acceptability in mainstream medical practice, especially in older persons. This study explored the impact of long-term fasting (12 days, 250kcal/day) on muscle structure, metabolism, and performance.

METHODS
In a prospective study of 32 subjects (16 men and 16 women; 16≤ 50 and 16>50 years-old), muscle volume, composition, relaxometry data, and lipid metabolism were assessed before, at the end, and one month after fasting. Assessments involved high- resolution 3D Dixon anatomical MR imaging, multi-echo CSE acquisitions, and single- voxel MR spectroscopy. Dynamic 31P-MRS acquisitions, quantitative MRI, maximal voluntary contraction (MVC) measures, and cardiorespiratory fitness (VO2max) were repeatedly examined throughout the protocol.

RESULTS
Average decrease of weight and skeletal muscle volumes was 5.9kg (7.4%) and 542ml (5.4%), respectively. This closely aligns with glycogen (1-2%) and bound water losses (3-4%) that are expected to reach 404-505 ml. MVC (anaerobic lactic metabolism) remained preserved in both upper and lower legs, regardless of sex or age. Unchanged T2 showed fasting did not induce structural or inflammatory changes. MRI/MRS revealed fat redistribution among tissues, with subcutaneous fat decrease and total fat fraction increase in muscle. Intramyocellular lipid pool increased while the extracellular lipid pool decreased revealing rapid lipid trafficking and rapid adaptation. The T2* increase during fasting likely stems from changes in intracellular lipid droplets configuration, with an increased proportion of lipid droplets of smaller size, optimizing accessibility of lipid fuels and mitochondrial FA. Cardiopulmonary exercise testing (VO2 max) revealed no alteration in maximal oxygen uptake during fasting, but an improved fat oxidation capability with a 10% increase in the first ventilatory threshold and a 10% decrease in the respiratory exchange ratio. Mitochondrial oxidative capacity and the rate of PCr resynthesis in muscle were maintained. Females improved their mitochondrial function at D+12, surpassing males, expressing better fat oxidation capabilities.

CONCLUSIONS
The leg muscle decrease volume is small when considering glycogen + water depletion during fasting. Fat relocates in the intracellular compartment of myocytes. Anaerobic and aerobic metabolic pathways remain unchanged after 12-day fasting.

CONFLICTS OF INTERESTS
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EPO7_120

SEVERE HEPATIC STEATOSIS IN OBESE ADULTS: STUDY OF ASSOCIATED FACTORS

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BACKGROUND AND OBJECTIVES
Non-alcoholic fatty liver disease (NAFLD) prevalence is strongly linked to the obesity epidemic (1). It involves a whole spectrum of liver damage of different severity, ranging from simple, isolated steatosis to non-alcoholic steatohepatitis (NASH), which is likely to progress to cirrhosis and hepatocellular carcinoma. The aim of our study was to identify the factors associated with hepatic steatosis severity in obese adults.

METHODS
This was a descriptive cross-sectional study including obese adults over a one-year period. Patients benefited from a dietary survey, anthropometric measurements and a biological assessment. Hepatic elasticity and controlled attenuation parameter (CAP) were measured by Fibroscan.

RESULTS
We included 208 patients with a mean age of 49±12 years and a sex ratio (F/H) of 8.9. Mean body mass index (BMI) was 40.43±6.38 kg/m2. Hepatic steatosis was found in 77.4% of obese patients, and was severe in 58.7% of cases. Advanced hepatic fibrosis was found in 4.3% of patients. In univariate analysis, the factors associated with the severity of hepatic steatosis were dietary intakes of fructose (p=0.01), polyunsaturated fatty acids (p=0.023), omega 3 (p=0.016), fiber (p=0.04), vitamin C (p=0.03), manganese (p=0.01) and zinc (p=0.01), as well as weight (p=0.004), BMI (p=0.007), obesity class (p=0.035) and waist circumference (p=0.012), waist circumference to height ratio (p=0.014), ASAT (p=0.004), ALAT (p<0.001), GGT (p=0.001), ASAT/ALAT ratio (p=0.001), type 2 diabetes (p=0.021), hypertriglyceridemia (p=0.006) and metabolic syndrome (p=0.01). In multivariate analysis, the factors independently associated with advanced liver steatosis were BMI (p=0.01; OR=1.066), triglyceride levels (p=0.03; OR=1.630), ASAT levels (p=0.03; OR=1.053) and ASAT/ALAT ratio (p=0.03; OR=1.296).

CONCLUSIONS
Our RESULTS showed that severe hepatic steatosis is closely linked to nutritional, clinical and biological factors associated with obesity. Early detection is therefore essential in order to provide appropriate nutritional management targeting the associated factors.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_121

PREVALENCE AND RISK FACTORS OF NON-ALCOHOLIC FATTY LIVER DISEASE IN OBESE ADULTS

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BACKGROUND AND OBJECTIVES
With the increasing prevalence of obesity, Non-Alcoholic Fatty Liver Disease (NAFLD) is considered to be the most common chronic liver disease in the world, affecting both developed and developing countries (1). Currently, there are no national data on its frequency and risk factors in obese people. The objectives of our study were to screen for NAFLD in a population of obese adults, and to identify risk factors.

METHODS
This was a descriptive cross-sectional study involving obese adults who underwent a dietary survey, anthropometric measurements and a biological assessment. Hepatic elasticity and controlled attenuation parameter (CAP) were measured by Fibroscan.

RESULTS
The mean age of the 208 patients included was 49±12 years with a sex ratio (F/H) of 8.9. Mean body mass index (BMI) was 40.43±6.38 kg/m2. The prevalence of hepatic steatosis was 77.4%. It was severe in 58.7% of cases, and advanced hepatic fibrosis was found in 4.3% of patients. Regarding anthropometric parameters, the factors associated with hepatic steatosis were weight (p=0.001), BMI (p=0.003), class 2 obesity (p=0.04), waist circumference (p=0.003) and waist circumference to height ratio (p=0.005). The study of nutritionnal parameters revealed that hepatic steatosis was associated with dietary intakes of omega 3 (p=0.012) and zinc (p=0.03). With regard to biological parameters, the factors associated with hepatic steatosis were type 2 diabetes (p<0.001), glycated haemoglobin (p<0.001), hypercholesterolaemia (p=0.035), hypertriglyceridaemia (p=0.017), HOMA index (p=0.03), ASAT (p=0.036), ALAT (p<0.001), GGT (p=0.006), ASAT/ALAT ratio (p<0.001). In multivariate analysis, the factors independently associated with hepatic steatosis were glycated haemoglobin level (p<0.001; OR=5.302), insulin level (p=0.016; OR=1.183), HOMA index (p=0.01; OR=1.531) and ALAT levels (p=0.001; OR=1.109).

CONCLUSIONS
In the light of our RESULTS, we recommend systematic screening for NAFLD using Fibroscan, especially in the obese population and more generally in any population at risk presenting insulin resistance, type 2 diabetes or dyslipidaemia.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_122

STUDY OF THE PREVALENCE AND ASSOCIATED FACTORS OF GLYCEMIC VARIABILITY IN TYPE 1 DIABETIC PATIENTS

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BACKGROUND AND OBJECTIVES

Glycemic variability (GV) is one of the three components of the glucose 'triumvirate' (1). Continuous glucose monitoring (CGM) has facilitated its measurement. The aims of our work were to study GV in type 1 diabetes mellitus (T1DM) and to determine the intrinsic and extrinsic factors associated with GV.

METHODS

This was a descriptive cross-sectional study including T1DM. Each patient received a CGM for 7 days. Intraday GV was defined as Coefficient of Variation (CV) >36% and/or Mean Amplitude of Glycemic Excursion (MAGE)>65mg/dl. Interday GV was defined as Mean of Daily Differences (MODD)>60mg/dl.

RESULTS

Ninety patients were included. The mean age was 16.94±2.2years. More than half of patients (62%) had a CV>36%, 96% of patients had a MAGE≥65mg/dl and 70% of patients had a MODD≥60mg/dl. Age was correlated with CV (r=0.26; p=0.012). Age at onset of diabetes was negatively correlated with CV (r=-0.3; p=0.004). The dawn phenomenon was associated with CV (p=0.016). Lipodystrophies were associated with intra-day (p=0.022) and inter-day ($p<10^{-3}$) GV. Patients on insulin analogues had a significantly lower MODD (p=0.028). The study of extrinsic factors related to the presence of GV showed that Carbohydrate intake was significantly associated with CV>36% (p=0.022). Patients with a MAGE ≥ 65mg/dl had significantly lower fiber intakes with p<10-3. Multivariate analysis showed that Carbohydrate intake (OR=2.4; p=0.022); sedentary lifestyle (OR=2.2; p=0.006); lipodysrophies (OR=6.5; p=0.011); autoimmune insulin syndrome (OR=5.6; p=0.039); quality of life score (OR=2.8; p=0.004) and dissatisfaction with treatment (OR=1.39; p=0.005) were independently associated with GV.

CONCLUSIONS

In the light of our RESULTS, we can conclude that the frequency of inter- and intra-day glycaemic variability is high in type 1 diabetics. It should therefore be systematically screened by continuous glucose monitoring.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_123

SARCOPENIA IN PATIENTS WITH TYPE 2 DIABETES: A NEW COMPLICATION

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BACKGROUND AND OBJECTIVES
Sarcopenia is a clinical condition defined as low skeletal muscle mass and function, leading to impaired physical performance and quality of life (1). In recent years, a strong relationship between sarcopenia and type 2 diabetes has been highlighted. Our objectives were to determine the prevalence of sarcopenia in type 2 diabetics, and to identify the associated nutritional risk factors.

METHODS
We conducted a cross-sectional study over a 4-month period, including 100 type 2 diabetic patients. We used the SARC-F to screen for sarcopenia, which was confirmed by measuring appendicular muscle mass using impedancemetry and muscle strength using the Hand-Grip test. We also carried out a dietary survey.

RESULTS
Patients had an average age of 63±5 years, with the majority (47%) aged between 45 and 54 years. The majority of the population were women (68%). The mean duration of diabetes was 15±8 years. 57% of the population were on insulin. Microangiopathic and macroangiopathic complications were prevalent in 56% and 13% of cases respectively. The prevalence of sarcopenia in type 2 diabetics was 11% (SAR+). Mean fasting plasma glucose (15.48±5.67 mmol/l vs 11.34±3.8 mmol/l; p= 0.003) and glycated haemoglobin (11.98±1.3% vs 10.67±1.6% ; p=0.013) were significantly higher in SAR+ patients than in SAR- patients, respectively. The study of nutritional risk factors revealed a calorie intake of 2350 Kcal/day in SAR+ patients, compared with 2554 Kcal/day in SAR- patients (p=NS). Protein intake was lower in SAR+ patients compared with SAR- patients (73.6±20.11 g/day versus 80.08±20.24 g/day respectively, p=NS). SAR+ patients had a higher intake of linoleic acid than SAR- patients (9.48 mg/day versus 8.79 mg/day, respectively, p=NS) as well as higher intakes of cholesterol (45.73 mg/day versus 34.22 mg/day respectively, p=NS) with a higher w6/w3 ratio, but with no significant statistical difference. Dietary fibre intake was lower in SAR+ patients (27.82 g/day versus 31.25 g/day for SAR- patients, p=NS). SAR+ patients had a lower intake of calcium (598.45 mg/day versus 605.15 mg/day), magnesium (272.09 mg/day versus 302.03 mg/day) and vitamin D (31.82 µg/day versus 36.77 µg/day) than SAR- patients, but with no significant difference.

CONCLUSIONS
Optimising glycaemic control, ensuring correct vitamin D3 status and a healthy, balanced diet would prevent the onset of sarcopenia in diabetic patients.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_124

BDNF GENETIC VARIANTS AND THEIR ASSOCIATION WITH OBESITY-RELATED PARAMETERS IN KOREANS

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BACKGROUND AND OBJECTIVES
The brain-derived neurotrophic factor (BDNF) gene has been strongly associated with eating disorders. However, evidence in Koreans is limited. This study aimed to investigate potential differences in the obesity-related parameters between BDNF (rs6265) genotypes in Koreans.

METHODS
A total of 252 healthy Korean adults aged 19-64 years (men: 37, women: 215) were recruited for this study. Participants underwent genotyping, anthropometric measurements, blood tests, and dietary assessments. They were categorized into obesity (OB, including overweight) and non-obesity (non-OB) groups, and wild and mutant groups based on DTC obesity gene SNPs (FTO, MC4R, BDNF). We examined the associations between obesity and obesity-related risk markers of each SNP variation.

RESULTS
Analysis of obesity frequency by SNP genotypes of DTC obesity genes showed a significant association between the mutant of BDNF, which regulates eating patterns, and increased obesity prevalence (p=0.023). The OB group exhibited higher systolic blood pressure (SBP), triglycerides (TG), low-density lipoprotein cholesterol (LDLc), and leptin, as well as anthropometric parameters, than the non-OB group. Conversely, the non-OB group had higher RMR/BW and high-density lipoprotein cholesterol (HDLc) than the OB group. Men generally had higher values for most parameters, except for HDL-C and leptin, which were higher in women. In subgroup analyses (OB/non-OB, wild/mutant), most differences were attributed to obesity status, leading to their exclusion as potential risk factors. The OB-mutant group had the highest TG and the lowest RMR/BW, with significance after adjustment for age and sex. The OB-mutant group had higher intake of sugar, fiber, folate, phosphorus, potassium, magnesium, and cholesterol. However, after adjusting for age, sex, and total calorie intake, only sugar, folate, and potassium remained significantly higher. In contrast, the non-OB-mutant group showed the opposite patterns in the metabolic and dietary factors.

CONCLUSIONS
This study is the first to provide scientific evidence that BDNF gene variants influence obesity metabolism due to energy imbalance in the Korean population. Obese adults with the BDNF mutant showed distinct metabolic patterns compared to the non-OB-mutant, emphasizing the need for personalized precision nutrition programs for weight management. These should focus on low-fat (cholesterol) and low-sugar guidelines to reduce blood TG and enhance basal metabolic rate. Additionally, high potassium intake may help balance sodium levels, while elevated folate and phosphorus appear to increase protein consumption.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_125

ASSESSMENT OF SMALL INTESTINAL INFLAMMATION IN ADULTS WITH ENVIRONMENTAL ENTEROPATHY IN ZAMBIA USING ORAL 15N2-L-ARGININE AND MEASUREMENT OF URINARY 15N-NITRATE BY ORBITRAP ISOTOPE RATIO MASS SPECTROMETRY

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BACKGROUND AND OBJECTIVES

Nitric oxide (NO) plays a pivotal role in many physiological processes, including the pathogenesis of inflammation. NO acts as an anti-inflammatory signalling molecule and becomes over-expressed at pro-inflammatory epithelial surfaces through the sequential oxidisation of L-arginine by inducible NO synthase to form L-citrulline and NO. Once absorbed, NO is further oxidised to nitrite (NO2), and ultimately the stable form nitrate (NO3) within tissues. 15NO3 excreted into the urine via the kidneys is an indirect measure of NO production from 15N-L-arginine. Here we used an oral 15N-L-arginine bolus with a short urine collection protocol to interrogate proximal small intestinal NO production as a proxy for gut inflammation in environmental enteropathy (EE).

METHODS

Samples were collected as part of the GI Tools study from a cohort of Zambian adults with EE, who underwent a panel of biomarker assessments, including intestinal fatty acid binding protein (iFABP), gut permeability (lactulose and rhamnose), and intestinal biopsy to measure epithelial surface area (ESA). Baseline urine was collected prior to oral administration of 15N2-(guanidineimino)-L-arginine (fixed dose: 1.667 mg). A subsequent urine sample was collected at 180 mins. Urines were diluted (1:100) in ACN:MeOH (75:25, v/v) + 0.2% formic acid. The samples were analysed by in-flow injection on a ThermoScientific Vanquish Neo HPLC coupled to an Orbitrap Exploris™ 480 Isotope Solutions system with 20 min acquisition period for NO3 isotopologues (61-65 m/z) in negative ion mode. Each sample injection was bracketed by an isotopically calibrated NO3 standard (USGS35) to produce δ15N-values relative to the internationally accepted reference for 15N (AIR). Δ15NO3, defined as 180 min δ15NO3 minus baseline δ15NO3, was calculated.

RESULTS

Δ15NO3 was measured in 37 participants (mean Δ15NO3 = 86.2, SD = 71.5 per mil). There was significant positive correlation between Δ15NO3 and iFABP ($r = 0.44$; $p = 0.007$) and negative correlation between Δ15NO3 and ESA ($r = -0.42$; $p = 0.019$). There was a trend towards a positive correlation between Δ15NO3 and lactulose:rhamnose ratio (LRR; $r = 0.41$, $p = 0.054$).

CONCLUSIONS

This simple, non-invasive test demonstrates the potential of oral 15N-L-arginine and urinary 15NO3 to measure localised gut inflammation in the proximal small intestine in environmental enteropathy.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_126

GUT BIDIRECTIONAL AMINO ACID TRANSPORT IN ENVIRONMENTAL ENTEROPATHY IN ZAMBIAN ADULTS

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BACKGROUND AND OBJECTIVES

Environmental enteropathy (EE) is a subclinical intestinal phenomenon common in Low- and Middle-Income Countries and is associated with growth failure, impaired cognitive development, poor vaccine response, and nutrient deficiencies (1,2). Gut barrier damage observed in EE has been shown to result in leakage of essential nutrients by confocal laser endomicroscopy (3). This study aimed to investigate Indispensable Amino Acid (IAA) transport, Bidirectional Transmucosal Amino Acid Flux (BTAAF) and gut permeability in Zambian adults to gain insights into intestinal barrier function and nutrient transport in EE.

METHODS

80 participants (33 M, 47 F; mean age 34.0 (SD 10.8)) were recruited from Misisi, Lusaka where EE is highly prevalent. Participants were given 5g lactulose and 1g rhamnose followed by a primed pseudo constant infusion of 13C6-phenylalanine (0.6 mmol/kg) orally through repeated oral drinks every 20 mins and 2H5-phenylalanine (0.6 mmol/kg) by continuous intravenous infusion for 240 mins. Plasma was collected serially over this period and a single intestinal aspirate and mucosal biopsy was also captured for morphometry at 240 mins. IAAs were purified for analysis by LC-MS. Uptake of amino acids (BTAAFin) was calculated by the plasma ratio 13C6-Phe/Phe relative to the plasma ratio 2H5-Phe/Phe. Efflux of amino acids from the plasma into the intestine (BTAAFout) was calculated by the intestinal aspirate ratio 2H5-Phe/Phe relative to the plasma ratio 2H5-Phe/Phe; theoretically this ratio can vary from 0 to 1 representing zero to full isotopic equilibration. Urine lactulose (%L) and rhamnose (%R) excretion was analysed by LC-MS and lactulose:rhamnose ratio (LRR) was calculated.

RESULTS

Mean (SD, n) BTAAFin was 1.4 (4.9; n=69) and BTAAFout was 3.7 (10.1; n=66) calculated and their correlations with measures of gut permeability analysed (Table 1).

Table 1: Correlation between BTAAFin and BTAAFout and %L, %R, and LRR.

	BTAAFin	BTAAFout
%L	0.01 (95% CI: -0.2, 0.2; p = 0.89)	-0.07 (95% CI: -0.33, 0.2; p = 0.6)
%R	0.12 (95% CI: -0.15, 0.337; p = 0.37)	0.04 (95% CI: -0.23, 0.32; p = 0.73)
LRR	-0.06 (95% CI: -0.33, 0.2; p = 0.63)	-0.12 (95% CI: -0.38, 0.15; p = 0.37)

CONCLUSIONS

Significant IAA leakage into the intestine in >66% of participants (BTAAFout >0.54) were observed and many may represent additional loss (or additional requirements) of IAAs. No correlation was observed with markers of gut permeability suggesting IAA leakage occurs independently of changes in gut permeability.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_128

PROTECTIVE EFFECTS OF ORIENTAL MEDICINE MIXTURES (CNIDIUM OFFICINALE, PUERARIA LOBATA OHWI, AND LEONURUS JAPONICUS) AGAINST OXIDATIVE STRESS AND INFLAMMATION IN VASCULAR DYSFUNCTIONS IN OX-LDL INDUCED HUVECS OVARIECTOMIZED RATS

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BACKGROUND AND OBJECTIVES
Menopause is a natural part of aging in women, often leading to estrogen deficiency, which can contribute to vascular dysfunctions.

METHODS
In this study, we examined the antioxidant and anti-inflammatory effects of extracts from *Cnidium officinale*, *Pueraria lobata* Ohwi, and *Leonurus Japonicus* (CPL) and their potential to alleviate vascular dysfunction in ox-LDL-induced HUVECs and ovariectomized rats.

RESULTS
The findings indicated that the CPL extracts reduced levels of VCAM-1 (vascular cell adhesion molecule 1) and ICAM-1 (intercellular adhesion molecule 1) by downregulating *NF-κB* (nuclear factor kappa-light-chain-enhancer of activated B cells), while enhancing the antioxidant markers *NRF2* (nuclear factor erythroid 2-related factor) and *HO-1* (heme oxygenase-1). Additionally, CPL extracts improved vascular function by upregulating *eNOS* (endothelial nitric oxide synthase) and downregulating *iNOS* (inducible nitric oxide synthase) in ox-LDL-induced HUVECs. In ovariectomized rats treated with CPL extracts for 12 weeks, improvements were observed in serum lipid profiles, vasoactive substances, tail temperature, and cardiovascular risk indicators.

CONCLUSIONS
Our RESULTS suggest that CPL extracts have potential benefits in combating cardiovascular dysfunction by enhancing the antioxidant system and reducing inflammation in both ox-LDL-induced HUVECs and ovariectomized rats.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_129

RECOGNITION OF FOOD TYPE AND PORTIONS USING BOOSTING AND BAGGING IN ENSEMBLE LEARNING

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BACKGROUND AND OBJECTIVES
Dietary intake is a critical factor influencing an individual's health. Proper nutritional assessment in dietary reports, including portion analysis of various food types, plays a vital role in how effectively dietitians communicate with people. Recent advancements in deep learning (DL) within artificial intelligence have enabled the detection of food ingredients and the estimation of energy and macronutrients using available datasets. However, the automatic estimation of portion sizes for individual food types within a single meal or dish remains an unaddressed challenge. This study aimed to apply bagging and boosting ensemble learning models to evaluate the portion sizes of five food types: whole grains, vegetables, fruits, fish-egg-meat (FEM), and oil-nut-seed (ONS). Overhead images from the Nutrition5K dataset served as input, while portion sizes for the five food types were generated as outputs.

METHODS
To generate the output files for the models, portion sizes for each food type in the dishes were calculated using metadata from the Nutrition5K dataset, following the guidelines specified in Taiwan's Food Exchange Table. A total of 1,960 dishes were annotated and compiled into a CSV file. The dataset was then used to train a deep learning model based on DenseNet-121, enhanced with self-attention blocks. Furthermore, ensemble learning techniques were incorporated to improve the model's performance.

RESULTS
The RESULTS demonstrated strong correlations between the predicted and ground-truth values. For the training dataset, the correlation coefficients (r) were 0.991, 0.951, 0.921, 0.956, and 0.977 for whole grains, vegetables, fruits, FEM, and ONS, respectively. On the test dataset, r exceeded 0.96 for whole grains and FEM, while vegetables, fruits, and ONS achieved values ranging from 0.87 to 0.93. These findings underscore the robust generalization capability of the deep learning model utilizing ensemble learning approaches for this dataset.

CONCLUSIONS
Ensemble learning in DL effectively addresses issues of bias and variability by leveraging multiple learners to solve complex problems. Given the diversity and complexity in food datasets, ensemble learning proves beneficial in mitigating bias and variability caused by variations in food patterns, appearances, and portion sizes. The RESULTS of this study advance the development of personalized dietary recommendations, bringing us closer to achieving precision nutrition.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_130

CAUSAL EFFECTS OF DIETARY FIBER INTAKE ON METABOLIC SYNDROME COMPONENTS: A MENDELIAN RANDOMIZATION ANALYSIS OF THE KOREAN GENOME AND EPIDEMIOLOGY STUDY (KOGES)

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BACKGROUND AND OBJECTIVES
Dietary fiber intake improves blood glucose regulation and blood pressure, serving a key strategy for preventing cardiovascular disease and metabolic syndrome (MetS). However, observational studies face limitations due to confounding factors and reverse causation. This study aimed to assess the causal relationship between dietary fiber intake and components of MetS using the Mendelian Randomization (MR) approach.

METHODS
A two-sample MR analysis was conducted using data from two KoGES cohorts: the Health Examinee Study (HEXA, n=58,144) for exposure and the Ansan and Ansung Study (n=57,456) for outcomes, which included participants aged 40–69 years. Genome-wide association study (GWAS) data were adjusted for sex, age, body mass index (BMI), education, total energy intake, alcohol consumption, marital status, and physical activity. A total of 103 single nucleotide polymorphisms (SNPs) associated with dietary fiber intake were selected based on genome-wide significance ($P \leq 5 \times 10^{-8}$), and linkage disequilibrium clumping ($P \leq 0.01$, $r^2 \leq 0.05$, ± 500 kb). Causal relationships were evaluated using IVW, Weighted Median, MR-Egger regression, Simple Mode, and Weighted Mode methods. Sensitivity analyses assessed heterogeneity and outliers using Cochran's Q test, MR-PRESSO, and Q-Q plots.

RESULTS
MR analysis showed that increased dietary fiber intake significantly reduced blood pressure (MR-Egger: OR = 0.848, 95% CI: 0.743–0.967, P = 0.016) and blood glucose (IVW: OR = 0.927, 95% CI: 0.862–0.997, P = 0.041). Pearson correlation analysis revealed significant associations between dietary fiber intake and systolic blood pressure (r = 0.043, P = 3.41E-72), diastolic blood pressure (r = 0.050, P = 1.19E-96), and fasting blood glucose (r = 0.015, P = 6.53E-10). Sensitivity analyses indicated no evidence of substantial heterogeneity for blood pressure (Q = 118.071, P = 0.118) or blood glucose (Q = 101.966, P = 0.482).

CONCLUSIONS
This study confirmed significant causal effects of dietary fiber intake on reducing blood pressure and improving blood glucose regulation. Utilizing the MR approach, which effectively minimizes confounding and reverse causation, these findings provide evidence supporting a causal relationship between dietary fiber intake and key components of MetS.
Funding: This work was supported by a National Research Foundation of Korea grant funded by the Korean Government (MSIT) (RS-2024-00340086).

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_131

POSITIVE ASSOCIATION BETWEEN COMPOSITE DIETARY ANTIOXIDANT INDEX AND LEFT VENTRICULAR EJECTION FRACTION IN HYPERTENSIVE PATIENTS: A CROSS-SECTIONAL STUDY

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BACKGROUND AND OBJECTIVES
There is growing evidence that antioxidant-rich diets may prevent hypertension and its resulting left ventricular dysfunction. The Composite Dietary Antioxidant Index (CDAI) is a valid and reliable nutritional tool for evaluating the antioxidant potential of diets. Therefore, the present study aimed to investigate the association between CDAI and Left Ventricular Ejection Fraction (LVEF) in hypertensive patients.

METHODS
Participants' sociodemographic and anthropometric data were collected using an interview-administered questionnaire. Participants' dietary intakes were obtained using a 24-hour dietary recall interview method. The CDAI was calculated from the intake of six dietary antioxidants: vitamins A, C, and E, manganese (Mn), selenium (Se), and zinc (Zn). Hypertension was defined by systolic blood pressure (SBP) ≥ 130 mmHg or diastolic blood pressure (DBP) ≥ 80 mmHg or the use of antihypertensive medications. Left Ventricular Ejection Fraction (LVEF) was assessed using echocardiography.

RESULTS
A total of 141 hypertensive participants were included in the study, with an average age of 64.75 years and a mean Body Mass Index (BMI) of 29.32 kg/m². The CDAI was divided into tertiles. Ordinal regression analysis showed that LVEF was positively associated with the CDAI (OR = 1.100, 95% CI: 1.032–1.171, p = 0.003). This association remained significant after adjusting for age, sex, and BMI (OR = 1.095, 95% CI: 1.025–1.161, p = 0.006). Higher CDAI scores were associated with increased dietary intake of polyunsaturated fatty acids (p < 0.001), energy intake (p = 0.004), manganese (p = 0.024), potassium (p = 0.012), retinol (p = 0.001), selenium (p < 0.001), sodium (p = 0.002), vitamin C (p = 0.001), vitamin E (p < 0.001), and zinc (p = 0.003). Lastly, Pearson correlation analyses revealed a significant negative correlation between the CDAI and blood pressure parameters [DBP (r = −0.304, p = 0.002) and SBP (r = −0.268, p = 0.006)] and a significant positive correlation between the CDAI and LVEF (r = 0.329, p < 0.001).

CONCLUSIONS
The RESULTS of this study suggest that the CDAI is positively associated with LVEF in hypertensive patients, indicating the potential role of dietary antioxidants in maintaining cardiac function.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_133

GENDER-SPECIFIC PATHWAYS LINKING NUTRIENT INTAKE, METABOLITES, AND METABOLIC SYNDROME COMPONENTS IN KOREAN ADULTS: A STRUCTURAL EQUATION MODELING ANALYSIS

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BACKGROUND AND OBJECTIVES
This study aimed to investigate the relationships among nutrient intake, metabolites, and metabolic syndrome components, with a focus on potential gender-specific differences in these associations.

METHODS
Data were obtained from 2,306 participants aged 40–69 years in the Korean Genome and Epidemiology Study (KoGES)-Ansan and Ansung cohorts. Four statistical methods—Wilcoxon rank sum test, logistic regression, partial least squares discriminant analysis, and group least absolute shrinkage and selection operator—identified metabolites associated with fasting blood glucose (FBG). A mixed-effects model identified four significantly different metabolites between the case group (FBG ≥ 100 mg/dL) and the control group (< 100 mg/dL). These metabolites were then analyzed using multiple structural equation models (SEMs) to explore the relationships among nutrient intake, metabolites, and metabolic syndrome components (FBG, triglyceride (TG), blood pressure (BP)) by gender.

RESULTS
The final model demonstrated a good fit to the data: $\chi^2(58) = 239.485$, CFI = .988, TLI = .981, RMSEA = .052 ($p = .296$), and SRMR = .023. Metabolites (Phosphatidylcholine acyl-alkyl C44:6 (PC ae C44:6) and HydroxySphingomyelin C14:1 (SM (OH) C14:1)) and nutrient (protein, sugar, phosphorus, vitamin B1) intake together explained 36.8% of the variance in FBG, TG, and BP for women and 51.3% for men. PC ae C44:6 and SM (OH) C14:1 exerted a significant negative influence on FBG, TG, and BP in both genders, with a stronger standardized effect in men ($\beta = -0.720$, $p < .001$) compared to women ($\beta = -0.605$, $p < .001$). Protein, sugar, phosphorus, and vitamin B1 intake showed a significant direct effect on FBG, TG, and BP only in men ($\beta = 0.103$, $p < .05$). Additionally, protein, sugar, phosphorus, and vitamin B1 intake had no statistically significant indirect effect on FBG, TG, and BP through PC ae C44:6 and SM (OH) C14:1 in men ($\beta = -0.0248$), whereas it showed a significant indirect effect in women mediated by these metabolites ($\beta = -0.0544$, $p < .05$).

CONCLUSIONS
This study revealed gender-specific pathways in the relationship between nutrient intake, metabolites, and metabolic syndrome components. Metabolites had a stronger influence in men, while nutrient intake affected women indirectly through metabolites.
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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_135

Nutrient and non-nutrient intake and their relationship with metabolic markers in an Italian cohort: preliminary RESULTS from the NUTRIPOP study

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BACKGROUND AND OBJECTIVES

The assessment of dietary intake plays a pivotal role in evaluating nutritional status, which is a prerequisite for maintaining overall health and preventing the development of chronic diseases. The aim of the present study was to explore nutrient and non-nutrient intake (e.g., polyphenols) and their relationship with metabolic markers in a group of apparently healthy free-living volunteers.

METHODS

Subjects aged ≥ 18 years and living in Northern Italy were recruited for participating in a cross-sectional study, as part of the OnFoods project (www.onfoods.it). Anthropometric measurements, including weight, height, body mass index (BMI) and waist circumference (WC) were obtained, while habitual food intake was assessed. Energy and nutrients were calculated by Metadieta software, while total polyphenols and flavonoids were retrieved from the Phenol-Explorer database. Blood samples were taken to assess several metabolic markers, and proteomic analysis.

RESULTS

In this preliminary analysis, a total of 103 subjects (35 men and 68 women) were included. Subjects showed a mean age of 40 ± 14 years and an average BMI of 22.9 ± 3.2 kg/m2, with the following waist circumference: 86 ± 10 cm in men and 77 ± 10 cm in women. Mean intake of energy was 1889 ± 630 kcal/day, while macronutrient distribution in percentage was as follows: 16 % protein, 34 % total fat (10 % saturated fat) and 50% total carbohydrates. Fiber intake adjusted for 1000 kcal was 13 ± 5 g/1000kcal/day. Polyphenol and flavonoid intake were 1281 ± 837 mg/day and 266 ± 249 mg/day, respectively. Both BMI and WC were positively associated with glucose, insulin, HOMA-IR, HDL-cholesterol, LDL-cholesterol and triglycerides, except for total cholesterol. Among dietary intake, carbohydrates were inversely correlated with HDL-C (r=- 0.256, p=0.02) but directly correlated with triglycerides (r= 0.224, p=0.02), while dietary flavonoids were inversely associated with both insulin and HOMA-IR (r=- 0.222, p=0.03).

CONCLUSIONS

Overall, RESULTS from this preliminary analysis showed that dietary habits of these volunteers seem to be in line with the Italian Dietary Guidelines, except for fiber intake. Interestingly, dietary flavonoids intake was inversely associated with serum insulin and HOMA-IR. Applying the proteomic approaches on those analysis will be pivotal for a better comprehension of nutrient and non-nutrient intake, metabolic status, and clarifying the correlations found.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_136

EFFICACY AND SAFETY OF ORAL SEMAGLUTIDE 25 MG IN ADULTS WITH OVERWEIGHT/OBESITY: THE OASIS 4 RCT

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BACKGROUND AND OBJECTIVES
OASIS 4 (NCT05564117) was a multi-site RCT evaluating once-daily oral semaglutide (sema) 25 mg (half the dose used in OASIS 1 [NCT05035095]) vs placebo in adults with overweight/obesity.

METHODS
Eligible participants (≥18 years; BMI ≥30 kg/m2 or ≥27 kg/m2 with ≥1 weightrelated comorbidity) were randomized 2:1 to once-daily oral sema escalated to 25 mg or placebo for 64 weeks, with a lifestyle intervention. Co-primary endpoints were percent weight change and achievement of ≥5% weight loss (WL). Confirmatory secondary endpoints were achievement of ≥10% WL, ≥15% WL, ≥20% WL, and change in IWQOL-Lite-CT Physical
Function score. Efficacy data were analyzed using the treatment policy estimand with in-trial data unless stated otherwise.

RESULTS
Participants (sema n=205; placebo n=102) were mostly female (78.8%), with a mean age of 48 years, and bodyweight of 105.9 kg. Mean weight change was –13.6% in the sema group vs –2.2% in the placebo group ($p<0.0001$), and –16.6% vs –2.7% using ontreatment data. A greater proportion of participants achieved ≥5% WL (79.2% vs 31.1%), ≥10% WL (63.0% vs 14.4%), ≥15% WL (50.0% vs 5.6%), and ≥20% WL (29.7% vs 3.3%) in the sema group vs placebo (all $p<0.0001$). Greater improvements in IWQOL-Lite-CT Physical Function score were observed in the sema vs placebo groups (ETD 7.7 points, $p=0.0006$). Significant improvements in cardiometabolic risk factors were also observed with sema vs placebo. Incidence of all AEs (sema 93.1% vs 85.3%) and of AEs leading to permanent treatment discontinuation (sema 6.9% vs placebo 5.9%; mostly gastrointestinal AEs) was comparable between groups. There was a lower incidence of serious AEs in the sema group (3.9%) vs the placebo group (8.8%).

CONCLUSIONS
Once-daily oral sema 25 mg significantly reduced bodyweight, increased physical function, and improved metabolic health in adults with overweight/obesity, with comparable efficacy to sema 50 mg in the OASIS 1 trial. Safety and tolerability were consistent with the well-established profile of sema.

CONFLICTS OF INTERESTS
Ruben Duque do Vale: Novo Nordisk employeeTobias Karlsson: Novo Nordisk employeeVanessa Folope Leborgne: Novo Nordisk employeeDomenica Rubino is currently a clinical investigator for Novo Nordisk, Boehringer Ingelheim, and Kallyope; received consultant/advisor fees from Novo Nordisk, Regeneron, Boehringer Ingelheim, Shionogi, Cytoki, Lilly; payment or honoraria for participating as a speaker from Novo Nordisk; CME honoraria from Prime Therapeutics, Peer View, Medscape, Endocrine Society, and ADA; travel support for speaking/presenting from Novo Nordisk, Boehringer Ingelheim, Lilly, Prime Inc., Peer View, Medscape, Endocrine Society, ADA; support for meeting registration from Endocrine Society, ADA, TOS; medical writing support from Novo Nordisk, Boehringer Ingelheim; and is a shareholder at Lilly.Ildiko Lingvay declares having received research grants from Boehringer Ingelheim, Merck, Mylan Pharmaceuticals Inc., Novo Nordisk, Pfizer, and SANOFI US SERVICES INC.; she has served as a consultant for AstraZeneca, Bayer

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EPO7_137

CAUSAL RELATIONSHIP BETWEEN KIMCHI CONSUMPTION AND ABDOMINAL OBESITY IN KOREANS: A TWO-SAMPLE MENDELIAN RANDOMIZATION STUDY

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BACKGROUND AND OBJECTIVES
Metabolic syndrome is a major risk factor for cardiovascular disease and diabetes, strongly influenced by lifestyle and dietary habits. However, existing observational studies have limitations in establishing causal relationships between food consumption and metabolic syndrome due to issues such as confounding variables and reverse causality. Based on previous findings suggesting that kimchi consumption may reduce the risk of metabolic syndrome, this study aimed to evaluate the causal relationship between high kimchi consumption and metabolic syndrome and its components, using two-sample Mendelian randomization (MR).

METHODS
This study included Korean Genome and Epidemiology Study (KoGES) Health Examinees (HEXA) cohort (n=57,456) and Ansan/Ansung cohort (n=5,029) to assess the causal relationship between kimchi consumption and abdominal obesity. Participants aged 40–69 years were included. Genetic variants identified through genome-wide association studies (GWAS) with a threshold of $p<5\times10^{-5}$ and linkage disequilibrium ($r^2<0.05$) were used as instrumental variables. A total of 130 single nucleotide polymorphisms (SNPs) were selected as instrumental variables. Kimchi consumption included various types such as baechu kimchi, kkakdugi, and nabak kimchi. Participants were classified into high-kimchi intake group (>75th percentile) and low-kimchi intake group (≤75th percentile). Abdominal obesity was defined as a waist circumference ≥90 cm in men and ≥85 cm in women. MR analyses were performed using MR-Egger, inverse-variance weighted (IVW), and weighted median methods. Sensitivity analyses, including leave-one-out analysis and heterogeneity tests, were conducted to ensure the robustness of the RESULTS.

RESULTS
High-kimchi intake group showed higher intake levels of key nutrients, such as energy, protein, dietary fiber, vitamin C, and folate, compared to the low consumption group. MR analysis indicated that high kimchi consumption significantly reduced abdominal obesity in the IVW model (OR = 0.84, 95% Cl = 0.707-0.997, P-value<0.05).

CONCLUSIONS
This study suggests that high kimchi consumption may contribute to a reduction in abdominal obesity among Koreans.
Funding: This work was supported by a National Research Foundation of Korea grant funded by the Korean Government (MSIT) (RS-2024-00340086).

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_138

CLINICAL ETHICAL DILEMMA IN ADVANCING NUTRITION AND DIETETICS PRACTICE IN JAPAN

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BACKGROUND AND OBJECTIVES
In the aging society of Japan, artificial hydration and nutrition (AHN) for the elderly have been provided with careful consideration through the cooperation of healthcare professionals.However, dietitians at hospitals, care facilities, and home care settings experience complicated ethical dilemmas in nutritional care practices. This study aims to clarify the ethical issues in various advanced nutritional care settings.

METHODS
Semi-structured interviews were conducted with dietitians working in elderly care, pediatric wards, ER/ICUs, psychiatric wards, and facilities for individuals with severe motor and intellectual disabilities (SMID). Regarding cases of ethical dilemma, we collected the medical background, the patient's will, and the thoughts of the related persons (family and care staff, etc.) based on bioethical principles , and qualitatively analyzed the conflicting values.

RESULTS
Nineteen cases of ethical dilemmas in the practice of nutritional care were collected and qualitatively analyzed. The ethical dilemmas in nutritional care were classified into four main categories; (1) the conflict of whether or not to respect the patient's will to refuse food or nutrition intake (at ER, elderly care, and psychiatric wards) , (2) the family or healthcare professional's intention was prioritized over the patient's will (at pediatric wards, psychiatric wards, and SMID facilities), (3) unexpected and disappointing RESULTS for patients and dietitians due to insufficient risk prediction or patient explanation (end of life cases), and (4) the imbalance between personalized approach to diet and/or nutritional care and healthcare service equity.

CONCLUSIONS
This study has revealed that ethical dilemmas occur in acute care, disability, pediatric, and other cases where it is difficult for patients to make decisions and where appropriate dietary therapy is not implemented. Dietitians should have sufficient knowledge of clinical ethics as well as clinical nutrition, and practice nutritional care that takes into account patient decision-making and quality of life.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_139

LONG-TERM EFFECTS OF SHORT-CHAIN FRUCTO-OLIGOSACCHARIDE PREBIOTIC SUPPLEMENTATION ON GUT MICROBIOTA, GLUCOSE HOMEOSTASIS AND BODY COMPOSITION IN PREDIABETIC SUBJECTS: A RANDOMIZED, DOUBLE-BLINDED, PLACEBO-CONTROLLED STUDY

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BACKGROUND AND OBJECTIVES
Dietary changes and sedentary lifestyles observed over several years have increased metabolic disorders like obesity and type 2 diabetes. Dietary fibres may help reduce their development, particularly by positively improving the gut microbiota. This study aimed to assess the effects of short-chain fructo-oligosaccharides (scFOS) prebiotic fibre on gut microbiota, glucose homeostasis and body composition in prediabetic overweight individuals.

METHODS
In this randomized, double-blinded, placebo-controlled study, 66 participants were included and consumed either 20 g of placebo or scFOS supplement (ACTILIGHT® 950P; Beghin-Meiji; France) daily for 12 weeks. Parameters related to faecal microbiota, glucose homeostasis, and body composition were measured before (V2: randomization visit) and after the intervention (V5: end of supplement intake).

RESULTS
The mean age of participants was 50.6 ± 9.0 years, with a mean BMI of 28.2 ± 2.7 kg/m². Compliance was high, with over 97% adherence. Regarding gut microbiota (in 30 participants), α-diversity increased between V2 and V5 in the placebo arm, whereas it decreased in the scFOS arm across 3 out of the 4 different diversity indices ($p<0.004$). The effect of scFOS on α-diversity is mainly related to a clear bifidogenic effect. Indeed, the increase of the relative abundance of *Bifidobacterium* was higher in the scFOS arm compared to the placebo arm ($p=0.0202$). These changes were associated with a modification of gut fermentative activity, as shown by an increase in the levels of two SCFAs in the scFOS arm compared to a decrease in the placebo arm: acetate ($p=0.0310$) and propionate ($p=0.0062$). No significant differences were observed between the scFOS and placebo arms for markers of glucose metabolism. However, some body composition parameters displayed significant differences between arms during the follow-up. Body fat mass decreased in the scFOS arm (absolute and relative variations) while it increased in the placebo arm between V2 and V5 (medians: -0.15 kg *vs* +0.27 kg, $p=0.0400$; -0.26% *vs* +0.20%, $p=0.0273$). Conversely, lean mass (relative variation) followed the opposite trend.

CONCLUSIONS
Positive effects of scFOS supplementation were observed on gut microbiota composition and its fermentative activity, as well as on body fat mass, in prediabetic adults after a 12-week supplementation. Although no clear improvement of glucose homeostasis was observed, these findings, while preliminary, suggest that scFOS may offer benefits in areas related to gut health and body composition.

CONFLICTS OF INTERESTS
Cindy Le Bourgot is an employee of Tereos, funding the study

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EPO7_141

MARINE N-3 FATTY ACID TREATMENT FOR REDUCED CAROTID PLAQUES IN PATIENTS WITH TYPE 2 DIABETES: INSIGHTS FROM THE PNMD TRIAL

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BACKGROUND AND OBJECTIVES
Carotid plaques result from a blockage or narrowing of carotid arteries associated with severe atherosclerotic cardiovascular diseases. How marine n-3 fatty acid supplementation reduces carotid plaques among patients with diabetes and whether the effect is modified by genetics remain unclear. To assess the effect of marine n-3 fatty acid supplementation on carotid plaques and interactions with genetics among patients with diabetes.

METHODS
In this 14-month double-blind, randomized controlled trial, 415 patients with type 2 diabetes (T2D) were randomly assigned to receive high-dose (3.0 g/day) or low-dose (1.5 g/day) marine n-3 fatty acids (fish oil) or placebo (refined olive oil). The primary outcome was the prevalence of carotid plaques. Secondary outcomes included changes in NMR-derived lipoprotein subclasses and their mediation effects on carotid plaques. Genetic interactions with the supplementation were also investigated.

RESULTS
383 participants (92.3%) completed the 14-month intervention and 358 patients (86.3%) completed carotid ultrasound exams. Fish oil supplementation was significantly associated with reduced prevalence of carotid plaques (P trend=0.023). Compared to the placebo, the adjusted odds ratios (95% CIs) were 0.41 (0.19-0.88) and 0.86 (0.42-1.79) for high-dose and low-dose groups, respectively. High-dose intervention significantly reduced remnant cholesterol, LDL-1-triglycerides (TG), HDL-4-TG, and HDL-3-TG, which largely mediated anti-atherosclerotic effect. Additionally, the effect was most prominent among patients with low genetic risk of remnant cholesterol and LDL. Variants of ELOVL2 (rs2295602, rs4711171, and rs3734398) significantly modified the protective effects of high-dose marine n-3 fatty acids against carotid plaques.

CONCLUSIONS
Supplementation with high-dose marine n-3 fatty acids resulted in lower prevalence of carotid plaques among T2D patients mediated by improving lipoprotein profile and modified by genetic risk of remnant cholesterol and LDL.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_142

ELEVATED VISCERAL FAT IS ASSOCIATED WITH REDUCED FUNCTIONALITY AND INCREASED SYMPTOMS OF PAIN AND INSOMNIA IN WOMEN WITH BREAST CANCER

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BACKGROUND AND OBJECTIVES

Health-Related Quality of Life (HRQoL) encompasses various factors that influence an individual's health, such as antineoplastic treatment, changes in personal, family, and work life, as well as alterations in body composition. Among these changes, increased body fat percentage and decreased muscle mass are frequently observed. Specifically, visceral fat (VF) has been associated with an increased risk of recurrence and the development of various cancer types. This study aimed to investigate the association between HRQoL and VF in women with breast cancer (BC).

METHODS

This observational cross-sectional study was conducted with women diagnosed with BC within the past 12 months, without metastases or recurrences. HRQoL and its domains were assessed using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30) and the Breast Cancer-specific Quality of Life Questionnaire Core 23 (EORTC QLQ-BR23). VF was measured using dual-energy X-ray absorptiometry (DXA). Multivariate linear regression models were conducted, with a significance level of $p < 0.05$.

RESULTS

The study included 114 women, with a mean age of 55.2 ± 11.3 years, predominantly Black or mixed race (65.8%), insufficiently active (70.2%), in clinical stage II (41.2%), with invasive lobular carcinoma histological subtype (69.3%), and luminal B molecular subtype (44.7%). A high prevalence of elevated body fat (86.0%) and VF (62.5%) was observed. In the final adjusted model, VF remained associated with the functional scale (β = -0.27; 95% CI -19.04 to -4.00; $p = 0.003$), physical function (β = -0.22; 95% CI -18.94 to -2.06; $p = 0.019$), and functional performance (β = -0.28; 95% CI -27.97 to -2.52; $p = 0.019$). Regarding symptoms, VF was associated with the overall symptom scale (β = 0.28; 95% CI 18.55 to 0.95; $p = 0.003$), pain (β = 0.36; 95% CI 12.44 to 39.24; $p < 0.001$), and insomnia (β = 0.23; 95% CI 3.61 to 35.80; $p = 0.017$).

CONCLUSIONS

Elevated visceral fat was associated with worsened functionality (physical and functional performance) as well as symptoms of pain and insomnia in women with breast cancer.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_143

COMPARISON OF MEASURED BMR AND BMR ASSESSED VIA BIOIMPEDANCE IN A BRAZILIAN ADULT SAMPLE: DESCRIPTIVE STUDY

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BACKGROUND AND OBJECTIVES
Bioimpedance impedance analysis (BIA) is an accessible tool for measuring body composition and estimating basal metabolic rate (BMR) in clinical settings. Due to its high cost, indirect calorimetry's use, considered the gold standard for measuring BMR, is not widespread (McLester et al., 2020; Karagun et al., 2024). This study aimed to compare BMR values provided by two bioimpedance devices with those from indirect calorimetry in Brazilian adults.

METHODS
Fifty participants aged between 18 and 60 years old of both sexes were evaluated, 64% female, age of 31.7 ± 9.5 years old, and BMI of 25.1± 4.8 kg/m2. BMR was measured using tetrapolar (Biodynamics 450) and octopolar (Tanita BC-418) bioimpedance devices, and indirect calorimetry (Medgraphics VO2000) (Anjos et al. 2014). Calculations used the Weir (1949) equation, with the final BMR (kcal/day) value derived by the mean of the last 20 minutes multiplied by 1440. Statistical analysis was performed using paired t-tests (QuickCalc Prism), with significance set at 5%.

RESULTS
Significant differences were observed between the two bioimpedance devices. The mean BMR measured by indirect calorimetry was 1279.42 ± 272.24 kcal/day, and was significantly lower than the mean BMR from the tetrapolar device (1632.96 ± 396.48 kcal/day, $p < 0.0001$) and the octopolar device (1540.12 ± 376.32 kcal/day, $p < 0.0001$).

CONCLUSIONS
Octopolar bioimpedance yielded RESULTS closest to indirect calorimetry compared to the tetrapolar device. However, an important difference was observed between the bioimpedance devices and indirect calorimetry. Thus, the substitution of measurements should be used with caution. Financial Support: UFMS/PROPP Notice 80/2023 and CNPq (433760-2018-4 and 314885-2020-0).

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_144

THE ASSOCIATION BETWEEN CIRCULATING FATTY ACIDS PATTERNS AND THE RISK OF CARDIOVASCULAR DISEASE IN PATIENTS WITH TYPE 2 DIABETES: A CASE-CONTROL STUDY

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BACKGROUND AND OBJECTIVES
Historically, research has primarily focused on the impact of individual FAs on cardiovascular diseases (CVD). Our study aimed to investigate the relationship between patterns of circulating FAs and the risk of cardiovascular disease in individuals with type 2 diabetes (T2DM) and CVD.

METHODS
We conducted a 1:1 age- and sex-matched case-control study of 303 Chinese patients with T2DM, comparing those newly diagnosed with CVD to controls. Serum FAs were analyzed with a Shimadzu GCMS QP2010 SE gas chromatograph coupled with a mass spectrometer. Principal component analysis (PCA) was employed to identify patterns of circulating fatty acids. Conditional logistic regression analysis was used to explore the association between circulating FA patterns and T2DM CVD.

RESULTS
A total of 22 types of serum FAs were detected. Compared to the control group, individuals with T2DM CVD had significantly lower serum levels of C22:0, C18:1 n-9, C16:0, C18:0, C20:3 n-6, C24:0, C17:0, C20:0, C15:0, C16:1 n-7, and C23:0, but higher levels of C22:6 n-3, C18:3 n-6, C20:4 n-6, and C20:5 n-3 ($P<0.05$). The FAP1 pattern (characterized by higher levels of C16:1 n-7, C23:0, C24:0, C22:0, and C18:1 n-9, and lower levels of C15:0 and C12:0) was inversely associated with CVD risk in patients with diabetes after multivariable adjustment (OR=0.40; 95% CI=0.17, 0.87; P=0.02).

CONCLUSIONS
Circulating FA patterns with higher levels of C16:1 n-7, C23:0, C24:0, C22:0, and C18:1 n-9, and lower levels of C15:0 and C12:0, may be associated with a reduced risk of T2DM CVD.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_146

GENETIC ASSOCIATION BETWEEN COFFEE CONSUMPTION AND METABOLIC SYNDROME AND ITS COMPONENTS IN KOREAN ADULTS: A MENDELIAN RANDOMIZATION ANALYSIS

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BACKGROUND AND OBJECTIVES
Coffee is one of the most widely consumed beverages globally. While numerous studies have explored the relationship between coffee consumption and metabolic syndrome (MetS), their findings remain inconsistent, and the causal relationship is still uncertain. This study employed the Mendelian randomization (MR) approach to investigate the association between coffee consumption, MetS, and its components.

METHODS
This study was conducted on 64,186 Korean adults aged 40 to 69 years, extracted from the Korean Genome and Epidemiology Study (KoGES) Health Examinees (HEXA) cohort, conducted between 2004 and 2013. Coffee consumption data were collected using a Food Frequency Questionnaire (FFQ), and daily coffee intake was categorized into high-consumption (>75th percentile) and low-consumption groups (≤75th percentile). Instrumental variables (IVs) were selected based on 127 common single nucleotide polymorphisms (SNPs) associated with coffee consumption and components of MetS. The relationship between coffee consumption and MetS, as well as its components was assessed using MR analysis. MR analysis employed methods including Inverse Variance Weighted, MR Egger, Weighted Median, Weighted Mode, and Simple Mode. The MR RESULTS were further evaluated for reliability through heterogeneity tests, pleiotropy assessments, MR-PRESSO and sensitivity analyses using leave-one-out methods.

RESULTS
The MR analysis revealed significant pleiotropy among the SNPs associated with MetS and its components, leading to the interpretation of RESULTS using the MR-Egger method. Participants with genetically predicted higher coffee consumption exhibited significantly lower levels of blood glucose compared to those with lower coffee consumption (Odds Ratio [OR]: 0.588; 95% Confidence Interval [CI]: 0.442–0.782), blood pressure (OR: 0.719; 95% CI: 0.590–0.876), waist circumference (OR: 0.593; 95% CI: 0.453–0.776), triglycerides (OR: 0.655; 95% CI: 0.536–0.876), and MetS prevalence (OR: 0.797; 95% CI: 0.637–0.996) compared to those with lower coffee consumption.

CONCLUSIONS
Coffee consumption was found to be associated with a lower prevalence of MetS and its components in Korean middle-aged adults. Using MR analysis with IVs, a potential causal relationship between coffee consumption and MetS, and its components, was demonstrated.
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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_148

LIFESTYLE COMBINATION PATTERNS AS KEY MODIFIABLE FACTORS FOR TYPE 2 DIABETES MELLITUS RISK IN MIDDLE-AGED KOREAN MEN

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BACKGROUND AND OBJECTIVES
The global prevalence of type 2 diabetes mellitus (T2DM) is increasing, and in South Korea, approximately 57% of adults aged 30 and older have diabetes or prediabetes, with a higher prevalence among men. Despite advancements in treatment and combination therapies, the management rate has not significantly improved, indicating the need for a preventive approach. Although lifestyle modifications have been shown to reduce diabetes risk, most studies have used a uniform methodology, and research on individualized prevention strategies is limited. This study aimed to analyze the lifestyle combination patterns of middle-aged men in South Korea and assess the associated risk of T2DM.

METHODS
A total of 2,346 middle-aged men without T2DM at the baseline survey (2001-2002) from the community-based cohort of the Korean Genome and Epidemiology Study (KoGES) were included. The incidence of T2DM was tracked up to the 8th follow-up (2017-2018). Lifestyle combination patterns were identified through principal component and factor analyses based on baseline sociodemographic, lifestyle, anthropometric and dietary data. Cox regression analysis was performed to evaluate the incidence of T2DM according to each pattern.

RESULTS
Four lifestyle combination patterns were identified in middle-aged men: Healthy Lifestyle, Low Carb & High Protein, High SES & Irregular Lifestyle, and Obesity & Bad Eating Habits. Individuals in the second tertile of the Healthy Lifestyle pattern (Pattern 1) showed a significantly reduced risk of diabetes incidence (HR tertile 2 vs. 1 = 0.75, 95% CI = 0.62–0.90), while individuals characterized by High SES & Irregular Lifestyle (Pattern 3) and Obesity & Bad Eating Habits (Pattern 4) exhibited a significantly increased risk of T2DM (HR Pattern 3: tertile 3 vs. 1 = 1.24, 95% CI = 1.01–1.53; Pattern 4: tertile 3 vs. 1 = 2.60, 95% CI = 2.14–3.17).

CONCLUSIONS
This study confirmed that the characteristics of Pattern 3, such as frequent late-night snacking, eating out, and low physical activity, as well as the negative factors of Pattern 4, including high body fat, BMI, overeating frequency, and fast eating speed, have a greater effect on the onset of diabetes than healthy lifestyle habits. These findings emphasize the importance of variable correlations to identify priority areas for improvement and develop targeted interventions. This study highlights distinct lifestyle combination patterns and their differential impact on T2DM risk, underscoring the need for tailored preventive interventions to effectively reduce the T2DM burden.

CONFLICTS OF INTERESTS
This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT) (No. RS-2022-NR069092)

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EPO7_151

PERSONALIZED HERBAL MIXTURE ENHANCES LINEAR GROWTH, GASTROINTESTINAL FUNCTION, DIET QUALITY, AND RESPIRATORY HEALTH IN KOREAN CHILDREN

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BACKGROUND AND OBJECTIVES
Nutritional status critically affects linear growth and child development. Gastrointestinal dysfunction, presenting as nausea, epigastric pain, and abdominal pain during growth phases, can diminish food intake and nutrient absorption, impacting long-term growth. Despite its importance, research exploring the interconnected impacts of nutritional status, gastrointestinal dysfunction, respiratory health, and linear growth remains sparse. This study addresses these gaps by aiming to assess the role of personalized herbal mixtures in ameliorating gastrointestinal symptoms and enhancing nutritional and growth outcomes in Korean children.

METHODS
Through a three-month intervention study, 40 Korean children aged 3 to 12 years received personalized herbal mixtures tailored to their individual health profiles. The usual dietary intake of nutrients was estimated by the multiple source method (MSM).

RESULTS
The intervention resulted in increased intake of several nutrients, with statistically significant enhancements observed specifically in vitamin E and fiber consumption. Concurrently, there was a notable reduction in gastrointestinal symptoms among 83% of participants, including decreases in nausea, epigastric pain, and abdominal pain. Additionally, the intervention correlated with a reduced frequency of respiratory infections, suggesting improved respiratory immunity. Importantly, there was a statistically significant improvement in height-for-age Z scores ($p<0.0001$), collectively indicating enhancements in linear growth through reduced gastrointestinal symptoms, enhanced nutrient intake, and decreased frequency of respiratory infections.

CONCLUSIONS
These findings suggest that personalized herbal mixtures may facilitate growth by improving digestive and respiratory health. Further studies are warranted to explore the underlying mechanisms through which these improvements occur.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_152

CHALLENGES AND FUTURE OF PRECISION NUTRITION

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BACKGROUND AND OBJECTIVES

Precision nutrition is a hot topic that everyone is paying attention to nowadays. However, when it comes to what foods or nutrients individuals should eat and how much they should eat, we are still helpless. This study aimed to investigate the impact of individual genetic background, metabolic characteristics, physiological status, intestinal microecology, and clinical parameters on nutritional needs and intervention effects, in order to meet the needs of individual growth and development, maintain individual health and normal physiological functions, and prevent and control disease occurrence and development.

METHODS

Summarizing our recent studies and literatures in relaton to precision nutrition.

RESULTS

When it comes to what foods or nutrients individuals should eat and how much they should eat, we are still helpless. Even with full genetic testing, clinical biochemistry, and gut microbiota testing, lifestyle and dietary intake data were collected. However, when faced with dozens of pages of testing data, especially genetic testing dada, we still cannot diagnose what nutrients the patient lacks and how much they lack, what foods to eat and how much to eat. Access to genetic testing, professional dietary supplements, and personalized nutrition services may be limited by cost, geographic location and healthcare differences. Efforts need to be made to improve the accessibility and affordability of precision nutrition services to ensure fair medical services and maximize the impact on public health. In addition, the integration of genetic testing and personalized dietary recommendations has raised ethical issues related to privacy, confidentiality, informed consent, and the possibility of genetic discrimination. Ethical standards and regulatory frameworks are crucial for protecting individual rights and ensuring responsible use of genetic information in clinical practice. Clear communication of genetic RESULTS, informed consent, and adherence to ethical guidelines are crucial to ensure that personalized dietary recommendations are both effective and ethical sound. The robust scientific evidences are important considerations into integrating personized nutrition into clinical practice. Large-sample size and multi-ethnic longitudinal studies, randomized controlled trials, and meta-analyses are essential to validate research findings, establish causal relationships, and elucidate the long-term effects of personalized dietary recommendations across diverse populations and health conditions.

CONCLUSIONS

The integration of n-of-1, nutrigenetics and multi omics data will help us deepen our understanding of the relationship between individual‘s dietary nutrition and health.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_153

EFFECT OF EGG CONSUMPTION ON PROTEIN FERMENTATION MARKERS IN HEALTHY ADULTS: FINDINGS FROM A RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES

Eggs are a highly digestible source of complete protein. While considerable research has explored diet's role in modulating gut microbiome function, little is understood about dietary factors driving protein fermentation in the colon. This study aimed to examine the impact of regular egg consumption on markers of protein fermentation in healthy adults.

METHODS

This 6-week parallel-arm randomised controlled trial examined the effects of consuming 2 eggs/day versus no eggs. Twenty-five healthy adults were randomised to either the intervention group (n=11) consuming 2 whole eggs daily or control group (n=13) avoiding eggs. 24-hour faecal collections at baseline and week 6 were analysed using liquid chromatography-mass spectrometry for short-chain fatty acids (SCFAs), branched-chain fatty acids (BCFAs), and protein fermentation metabolites. Statistical analysis used two-way ANOVA with uncorrected Fisher's least significant difference test. Data presented as median (mmol/g for SCFAs and BCFAs; μg/mg for protein metabolites).

RESULTS

No significant interaction was found between egg consumption status and timepoint regarding BCFA:SCFA ratio (p=0.8345). Similarly, key SCFAs, including acetic acid (p=0.5072), butanoic acid (p=0.2943), valeric acid (p=0.5181), and propionic acid (p=0.4577), showed no significant differences across diets and timepoints. Additionally, BCFAs also showed no significant differences across diets and timepoints, including isobutanoic (Baseline: Control=1.9, Egg=1.2; Week 6: Control=1.4, Egg=1.6; p=0.2003) and isovaleric acids (Baseline: Control=1.4, Egg=1.2; Week 6: Control=1.2, Egg=1.3; p=0.2090). Protein metabolites, including phenol (Baseline: Control=1.15, Egg=1.73; Week 6: Control=1.66, Egg=1.17; p=0.4982), p-cresol (Baseline: Control=64.71, Egg=56.71; Week 6: Control=52.24, Egg=63.88; p=0.1707), and 4-ethylphenol (Baseline: Control=0.255, Egg=0.29; Week 6: Control=0.3, Egg=0.11; p=0.4661) remained stable between groups.

CONCLUSIONS

The consumption of 2 eggs per day for 6 weeks did not significantly impact protein fermentation markers in healthy adults, as evidenced by stable BCFA:SCFA ratios and protein metabolite concentrations. Future research should explore longer interventions or diverse populations to further assess the metabolic effects of egg intake on the gut microbiome, particularly in populations with altered protein metabolism or digestive conditions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_154

EFFECTIVENESS OF A MOBILE-BASED NUTRITION INTERVENTION FOR THE MANAGEMENT OF SEVERE OBESITY IN CHILDREN AND ADOLESCENTS

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BACKGROUND AND OBJECTIVES
The management of obesity in children and adolescents requires a dual approach that addresses both intake regulation for weight control and adequate caloric and nutrient intake to support growth. While mid- to long-term nutrition intervention programs are essential for effective management, relevant research in South Korea remains limited. This study aimed to evaluate the effectiveness of a six-month mobile platform-based nutrition intervention delivered via a mobile platform in reducing caloric intake and improving dietary habits among children and adolescents with severe obesity (BMI ≥ 97th percentile).

METHODS
Diagnosis of nutritional issues was identified using the Nutrition Care Process (NCP), and individualized goals were established. Dietary intake was assessed using 3-day dietary records, while dietary habits were measured using the Nutrition Quotient for Children (NQ-C) and Adolescents (NQ-A), the Diet Quality Index-International (DQI-I), the Dutch Eating Behavior Questionnaire for Children (DEBQ-C), and the Yale Food Addiction Scale for Children (YFAS-C). The frequency of specific food consumption, such as soft drinks and snacks, was evaluated using a Food Frequency Questionnaire (FFQ). Participants received monthly nutrition education materials, including webtoons, animations, and card news, delivered through a mobile platform over six months

RESULTS
A total of 221 participants were enrolled in the study, and 155 completed the intervention. Following the intervention, participants exhibited a significant reduction in average caloric intake (2117.3 ± 466.2 kcal to 1910.1 ± 457.5 kcal; $p < 0.001$). Improvements in dietary habits were observed, with increased restraint of sugary and fatty food consumption as reflected in NQ scores for both children (37.4 ± 27.8 to 47.3 ± 22.3; 44.7 ± 22.8 to 55.1 ± 20.9; $p < 0.001$) and adolescents (29.5 ± 27.1 to 40.3 ± 24.8; 40.3 ± 27.6 to 52.3 ± 23.4; $p < 0.01$). DEBQ restrained eating scores decreased significantly (14.6 ± 2.7 to 13.8 ± 2.6; $p < 0.001$). The frequency of snacking, particularly soft drink consumption, also decreased significantly (2.4 ± 4.1 times per week to 1.6 ± 2.3 times per week; $p = 0.029$).

CONCLUSIONS
The six-month mobile platform – based nutrition intervention effectively reduced caloric intake and improved dietary habits in obese children and adolescents. These RESULTS suggest that mobile platform-based interventions can be a practical and accessible approach to addressing obesity and promoting healthier eating habits in this population.

CONFLICTS OF INTERESTS
This work was supported by the National Institute of Health (NIH) grant funded by the Korea government(KDCA) (No. 2022-ER1106-01).

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EPO7_156

DIRECT AND INDIRECT EFFECTS OF HEALTHY NORDIC AND MEDITERRANEAN DIET PATTERNS VIA GUT MICROBIOTA ON INTERMEDIATE RISK FACTORS FOR CARDIOMETABOLIC DISEASES

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BACKGROUND AND OBJECTIVES
Evidence suggest that diet and the gut microbiota interact in the development of cardiometabolic diseases (CMD). For example, the effects of dietary fiber-rich foods on weight loss and glucose metabolism have shown to vary depending on the Prevotella-to-Bacteroides (P/B) ratio in the gut. This study investigates whether adherence to the healthy Nordic or Mediterranean diet directly or indirectly affects intermediate risk factors for CMD via mediation by gut microbiota.

METHODS
439 participants from the Diet, Cancer and Health – Next Generations MAX sub cohort were included in the study. Diet was assessed from 24-hour dietary recalls, stool samples were analyzed by 16S rRNA gene amplicon sequencing and intermediate risk factors for CMD were included. Structural equation models were used to estimate the direct and indirect effect stratified by sex, where diet, adiposity, and lipidemia were modeled as latent variables.

RESULTS
No indirect effect of adherence to the healthy Nordic or Mediterranean diet on CMD risk factors mediated by the P/B ratio was found. In women, adherence to the healthy Nordic diet and Mediterranean diets associated with lower adiposity (5.3% lower BMI per dietary adherence unit 95% CI:1.0, 9.4 and 6.2% lower BMI per unit 95% CI:1.8, 10.3). Adherence to the healthy Nordic diet and Mediterranean diets also associated with lower lipidemia (6.7% lower TG per unit, 95% CI:0.9, 12.2 and 7.6% lower TG per unit 95% CI:1.6, 13.2) and lower levels of hs-CRP (14.4% per unit, 95% CI:1.5, 25.6 and 15.0% per unit, 95% CI:2.5, 25.8), indirectly through adiposity. In men, adherence to the healthy Nordic diet associated with lower adiposity (2.3% lower BMI per unit, 95% CI:0.5, 4.0). Adherence to the healthy Nordic diet also associated with lower lipidemia (2.5% lower TG per unit, 95% CI:0.5, 4.5) and lower levels of hs-CRP (4.8% per unit, 95% CI:0.3, 9.1), indirectly through adiposity.

CONCLUSIONS
While a healthy diet is known to affect CMD risk, it does not appear to be mediated through the P/B microbiota ratio. However, our findings support that healthy diet improves intermediate risk markers including lipidemia and hs-CRP, mediated by lower adiposity.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_158

INNOVATIVE NUTRITIONAL STRATEGIES IN CLINICAL RESEARCH: THE MENTORING FOR HEALTH AND DIBAN PROJECTS IN PRECISION NUTRITION FOR CANCER AND METABOLIC HEALTH

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BACKGROUND AND OBJECTIVES

Nutritional strategies are increasingly recognized as pivotal in clinical research, particularly in assessing the impact of diet on health outcomes and disease prevention. **The Mentoring for Health** (*Unveiling malnutrition and metabolic changes in lung cancer patients: setting the basis for precision nutrition models*) and **DiBaN** (*Linking Intestinal Bacteria and Host Metabolism to Tackle Type 2 Diabetes with Novel Food*) projects are two significant European initiatives supported by the Horizon EIC Pathfinder Challenge, focused on integrating precision nutrition into clinical trials for lung cancer and metabolic health. Conducted at IMDEA-Food, these projects aim to develop advanced nutritional interventions for better health outcomes.

METHODS

The *Mentoring for Health* project (EU project number: 101162297) addresses malnutrition and metabolic health in non-communicable diseases (NCDs), focusing on lung cancer patients. By applying precision nutrition tailored to individual genetic and lifestyle factors with a major focus on microbiota and glycobiology, the project aims to improve quality of life and prognosis. It also fosters training and collaboration among healthcare professionals and researchers to advance clinical applications of personalized nutrition.
In parallel, the *DiBaN* project (EU project number: 101162517) explores the role of personalized diet in metabolic diseases such as obesity and diabetes type 2 making use of alternative foods as novel tools. By integrating innovative methodologies (biomarker analysis and dietary interventions), the *DiBaN* project seeks to establish tailored dietary strategies that promote long-term health improvements and reduce the risk of chronic diseases.

RESULTS

Both projects highlight the importance of nutrition in clinical trials, demonstrating how personalized dietary strategies can enhance patient outcomes. They emphasize collaboration between researchers, healthcare providers, and patients to optimize the impact of nutritional interventions.

CONCLUSIONS

In conclusion, the *Mentoring* and *DiBaN* projects exemplify the potential of precision nutrition, providing critical insights into the role of diet in health and disease.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO7_159

GUT MICROBIOTA ENTEROTYPES AND METABOLOMIC MEDIATORS INFLUENCE WEIGHT LOSS IN MASLD: INSIGHTS FOR PRECISION NUTRITION

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BACKGROUND AND OBJECTIVES

Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD), the hepatic manifestation of metabolic syndrome, is closely associated with gut microbiota dysregulation. Emerging evidence highlights the potential of gut microbial profiles, or enterotypes, to modulate metabolic responses to dietary interventions. This study aimed to identify gut microbiota enterotypes and their metabolomic mediators in weight loss among subjects with MASLD.

METHODS

Ninety-eight MASLD patients were randomized to follow one of two dietary strategies (AHA or FLiO) for six months. The AHA diet followed the guidelines of the American Heart Association, while the FLiO diet was a modified Mediterranean dietary pattern. Gut microbiota composition was assessed using 16S rRNA gene sequencing, and serum non-targeted metabolomics analysis identified metabolic signatures. Mixed models were applied to examine their impact on weight loss, and mediation analysis evaluated metabolites linking enterotypes with weight loss responses.

RESULTS

At baseline, two distinct enterotypes were identified in this sample, characterized mainly by the abundance of *Prevotella* and *Bacteroides.* Participants from the Bacteroides enterotype achieved significantly higher weight loss than subjects belonging to the *Prevotella* enterotype. Mediation analyses identified that trans-3-methylthioacrylic acid mediated this association. Moreover, this metabolite could be a by-product of microbial sulfur fermentation.

CONCLUSIONS

Gut microbiota enterotypes significantly shape weight loss in MASLD, and this association is vastly mediated through metabolites. These RESULTS highlight the importance of studying the microbiome-metabolome-host network and offer potential insights for future precision nutrition strategies.

CONFLICTS OF INTERESTS

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EPO7_160

INVESTIGATION OF POSTPRANDIAL GLUCOSE RESPONSES IN HEALTHY ADULTS USING A DIGITAL CITIZEN SCIENCE APPROACHES – THE FOOD & YOU DE STUDY

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BACKGROUND AND OBJECTIVES
Maintaining metabolic health through personalized nutrition is gaining importance in addressing public health challenges like cardiovascular diseases and type 2 diabetes. Postprandial glucose responses (PPGR) offer valuable insights into individual metabolic reactions. Emerging technologies like continuous glucose monitoring (CGM) allow real-time tracking of glucose levels. The Food & You DE study investigates inter- and intra-individual variability in PPGR among healthy adults in Germany, aiming to identify key determinants and develop predictive tools for tailoring personalized nutrition strategies.

METHODS
The study used CGM devices (FreeStyle Libre) to monitor blood glucose levels continuously over a 14-day period in 109 healthy adults. Dietary intake was logged using the MyFoodRepo app, and standardized breakfast meals were used to assess glycemic variability under controlled conditions. Data on anthropometry, physical activity, sleep quality and duration, and stress as well as hunger levels were collected via digital platforms and questionnaires. Additionally, stool samples were taken and the gut microbiome was analyzed via 16S rRNA sequencing. Key metrics for PPGR analysis included the incremental area under the curve (iAUC), mean postprandial glucose, and glucose peak. Advanced statistical models, including multiple linear regression and mixed-effects models, were used to investigate interdependencies and variability in PPGR.

RESULTS
The comparability of the metrics iAUC, postprandial glucose, and glucose peak revealed a high correlation (R ranging between 0.636 and 0.929, $p<0.001$). Age was identified as the most significant determinant of PPGR, with glucose peak as the metric: $R=0.27$, $p=0.003$ for glucose; $R=0.27$, $p=0.003$ for bread with butter; and $R=0.33$, $p<0.001$ for bread. Other factors, such as meal timing, gut microbiome composition, and morning hunger levels, demonstrated limited influence on PPGR. A multiple linear regression model, accounted for up to 33.5% of the variance in the PPGR ($p<0.020$). Importantly, age and BMI exhibited significaion interaction effects: a higher BMI amplifies the glycemic response with increasing age, while physical activity tended to mitigate this effect.

CONCLUSIONS
By leveraging CGM and digital health tools, the Food & You DE study provides valuable insights into the variability of PPGR, paving the way for the development of machine-learning algorithms to predict individual glycemic reactions. These findings hold promise for advancing personalized nutrition strategies and reducing the risk of diet-related diseases.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_161

DIET AND NON-DIET RELATED FACTORS ASSOCIATED WITH A HIGH PREVALENCE OF ANAEMIA AND IRON DEFICIENCY IN FEMALE UNIVERSITY TEAM SPORT ATHLETES

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BACKGROUND AND OBJECTIVES
Female athletes, including those competing in team sports, are at an increased risk for developing iron deficiency compared to their male counterparts. Poor dietary intakes, particularly low dietary iron intake, are associated with a poor iron status in female athletes. The physiological effect of exercise and menstrual losses can also contribute to the development of iron deficiency. Being a student female athlete can further increase the risk for iron deficiency due to sub-optimal diets. Limited research is available on the iron status of South African university female team sport athletes and factors, including dietary intake, that are associated with iron status. This study aimed to explore the iron status and habitual dietary intake of South African female university team sport athletes.

METHODS
Fifty-six female university hockey, netball, and soccer players, aged 18–30 years participated in this study. A quantitative food frequency questionnaire was administered to assess habitual dietary intake, and the iron status markers haemoglobin (Hb), ferritin, and soluble transferrin receptor were measured.

RESULTS
The prevalence of anaemia and iron deficiency was 46.4% and 41.1%, respectively, with the highest prevalence in soccer. Dietary intake was similar between participants with a poor vs. normal iron status, but vitamin C tended to be lower ($p = 0.068$) in the iron deficient group. Total carbohydrate inversely correlated with Hb ($r = -0.282$, $p = 0.045$). Anaemic participants weighed less (61.4 ± 9.5 vs. 67.1 ± 9.9 kg, $p = 0.034$), trained more [10.0(8.0–10.0) vs. 8.0(6.0–10.0) hours/week] and were predominantly black African compared to non-anaemic participants. Soccer players also weighed less ($p < 0.001$), reported the highest training load and were all black African with a lower protein (% of total energy) and Vitamin C intake, and a higher carbohydrate intake (gram/kg/day) than hockey and netball players.

CONCLUSIONS
The prevalence of anaemia and iron deficiency in female university team sport athletes is a concern, especially in soccer players. Total carbohydrate intake – potentially at the expense of animal source protein and haem iron – as well as a low Vitamin C intake were associated with a poor iron status. A poor iron status was further associated with higher training loads, lower body weights and black African ethnicity. The consumption of a well-balanced diet, which meets daily energy and nutrient recommendations should be encouraged with an emphasis on Vitamin C intake to optimise non-heam iron absorption.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_162

ROLE OF ULTRAPROCESSED FOODS IN MODULATING THE EFFECT OF MEDITERRANEAN DIET ON HUMAN AND PLANET HEALTH – THE PROMENADE STUDY: PRELIMINARY FINDINGS FROM THE HUMAN INTERVENTION STUDY

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BACKGROUND AND OBJECTIVES
The Mediterranean diet (MD) is worldwide promoted as one of the healthiest and most sustainable dietary patterns. Despite MD includes the abundant consumption of plant-based foods typically consumed as raw or minimally processed, these products are increasingly replaced by ultra-processed foods (UPF) the which effect on human health is largely debated but poorly investigated. The present dietary intervention study aims at exploring for the first time whether the inclusion of UPF within a Mediterranean-based dietary pattern can impact on cardiometabolic markers, gut microbiota and other health markers in healthy Italian volunteers [1].

METHODS
A total of 50 clinically healthy adults will be recruited for a 7-month randomized, open, cross-over dietary intervention trial. Participants will be assigned to consume a 3-month MD high in UPF (intended as 5 UPF servings/day) or a low-UPF MD (intended as replacement with 5 unprocessed/minimally processed food serving/day), spaced by a 1-month wash-out period. Diets will be isocaloric and normalized for energy intake based on energy requirements. The primary endpoint will be the change in LDL-cholesterol levels from baseline. Blood, urine, and fecal samples will be collected from each participant before and after the dietary interventions, alongside food diaries and anthropometrics and body composition data.

RESULTS
So far, 23 participants have been recruited, 4 dropped out during the intervention so 19 have been enrolled in the intervention (13 men, 6 women; mean 27.3 BMI kg/m2; mean LDL cholesterol 224 mg/dL). Among them, 4 completed the entire trial by adhering to a MD-dietary pattern providing 15% and 35% energy from UPF in the low-UPF and high-UPF groups, respectively. Blood cholesterol significantly decreased after both interventions with no significant differences between the two groups. Preliminary findings revealed no significant changes in body weight nor in body composition.

CONCLUSIONS
The completion of the study is needed to better explore the degree to which the consumption of UPF influences the impact of the MD on human health, thus providing insights about a better understanding of the relationship between food processing and health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_164

DIETAI24: A NOVEL LLM-BASED DIETARY ASSESSMENT SOFTWARE FROM FOOD IMAGES

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BACKGROUND AND OBJECTIVES
We aimed to develop and validate innovative dietary assessment software that can accurately recognize foods, estimate portion sizes, and provide comprehensive nutrient estimations from food images, by combining large language models (LLMs) with nutrition databases.

METHODS
We developed DietAI24, combining LLM-based image analysis with a smart information retrieval system, to estimate up to 65 nutrients from food images collected by smartphone cameras. By integrating GPT-4 Turbo with the USDA Food and Nutrient Database for Dietary Studies (FNDDS), DietAI24 automatically matches food images to 5,624 standardized food items and over 23,000 portion sizes without requiring prior training data. We evaluated DietAI24 using two public data sources: ASA24 (17,000 dish images) and Nutrition5K (3,500 dish images), comparing its performance against three commercial apps (Calorie MAMA, Foodvisor, and SnapCalorie) and an advanced neural network model (ViT).

RESULTS
Using the ASA24 dataset, DietAI24 achieved mean absolute errors (MAE) per dish of 47.7 kcal for calories, 1.67g for fat, 6.95g for carbohydrates, 1.38g for protein, and 49.4g for dish mass, reducing errors by 76-83% for calories, 80-86% for fat, 71-78% for carbohydrates, and 67-88% for protein compared to commercial apps. Similar improvements were observed using the Nutrition5k dataset, with error reductions of 60-93% for calories, 51-72% for fat, 73-80% for carbohydrates, and 70-76% for protein. Expert evaluation by two dietitians confirmed DietAI24 achieved close to exact matches (scoring 3 or 4 on a 4-point scale, where 4 represents exact match) for both macro and micronutrients.

CONCLUSIONS
DietAI24 represents a substantial advancement in automated dietary assessment by enabling accurate, comprehensive nutrient estimation from smartphone images without manual entry, showing strong potential for large-scale dietary studies and clinical interventions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_165

COMPREHENSIVE ANALYSIS OF CIRCULATING HUMAN PROTEOME AND ITS ASSOCIATION WITH ADHERENCE TO THE MEDITERRANEAN DIET

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BACKGROUND AND OBJECTIVES
The Mediterranean diet (MD) is widely recognized for its beneficial effects on health, particularly in preventing cardiovascular, metabolic, and inflammatory diseases. The Medi-Lite index is a validated tool to assess individual adherence to the MD, offering insights into its relationship with molecular biomarkers. This study aimed to investigate significant variations in the circulating proteome associated with adherence to the MD, using the Medi-Lite score, and to evaluate the potential of the Mediterranean dietary pattern in promoting metabolic health.

METHODS
A cohort of 61 healthy individuals (mean age 44.4 ± 12.3 years; 43 females and 18 males) was recruited as part of the INSTEAD project (www.onfoods.it). Participants were stratified into high and low adherence groups based on the median Medi-Lite score. Circulating proteins were analyzed using the SOMAscan platform, quantifying 7596 plasma proteins. Proteins with moderate-to-strong correlations ($r \geq 0.3$) with the Medi-Lite score and statistically significant differences ($p < 0.05$) between adherence groups were selected for further analysis.

RESULTS
Among the circulating proteome analyzed, 33 proteins were identified as significantly associated with adherence to the Mediterranean diet. These proteins are involved in diverse biological pathways. For instance, Transcobalamin-1, essential for vitamin B12 transport and DNA synthesis, reflects the role of micronutrient metabolism. Ephrin-B1, a key regulator of cell-cell communication and tissue development, underscores the impact of dietary habits on cellular organization and morphogenesis. Complement component C9, part of the terminal complement complex, highlights the influence of the diet on innate immune responses. These proteins cluster within specific biological pathways, including those related to immune regulation, protein folding, cellular structure, and metabolic homeostasis.

CONCLUSIONS
The findings underline the potential of the MD to modulate the circulating proteome, with significant implications for public health. Identified proteins reflect key biological pathways, suggesting that optimal adherence to the MD is associated with improved metabolic and immune homeostasis. Future dietary intervention studies are pivotal in order to investigate their impact on underlying molecular mechanisms in different target populations, also to develop personalized strategies able to promote optimal health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_166

GUT MICROBIOTA COMPOSITION DIFFERS BETWEEN EARLY AND LATE CHRONOTYPES IN HUMANS

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BACKGROUND AND OBJECTIVES
Emerging evidence suggests that a bidirectional relationship between the circadian system and gut microbiota exists. Also, chronotype, the behavioral manifestation of circadian rhythms, influences metabolic health. In fact, late chronotypes have been linked to obesity, type 2 diabetes and unhealthier habits. However, the characterization of gut microbiota composition according to chronotype remains underexplored. Here, we investigated whether gut microbiota composition differs between chronotypes.

METHODS
Baseline data from 262 Spanish individuals from the OBEKIT study (NCT02737267) was analysed. Chronotype was determined using the Morningness-Eveningness Questionnaire, classifying participants into morning (upper tertile) and evening (lower tertile) chronotypes. Gut microbiota was profiled with 16S sequencing. Microbiota analyses were performed using the vegan package in R for diversity analysis and generalized lineal mixed models for differential analysis, all adjusted by age.

RESULTS
A total of 138 individuals were categorized as late chronotypes [70% female; mean (SD) age: 42 (11) years, BMI: 29.4 (4.8) kg/m²] and 124 as early chronotypes [70% female; age: 47 (10) years, BMI: 29.9 (5.4) kg/m²]. Alpha-diversity, according to Shannon and Pielou indexes, was significantly higher in early chronotypes (p=0.017 and p=0.028, respectively). Beta-diversity dissimilarity analysis (Aitchison index) confirmed differences in the overall taxonomic composition between chronotypes at species level (p= 0.05). In addition, two bacterial families that differed between chronotypes, namely, Borkfalkiaceae (pFDR = 0.026) and Candidatus Colimorpha enterica (pFDR = 0.048), both from the Clostridia class, were identified.

CONCLUSIONS
Our findings highlight differences in gut microbiota composition between chronotypes. Further research is needed to better understand this relationship and to guide the development of dietary strategies aimed at reducing the health risks associated with late chronotypes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_168

MEDITERRANEAN DIET ADHERENCE, TRIGLYCERIDE-GLUCOSE INDEX (TYG), AND ERYTHROCYTE MEMBRANE LIPIDOME IN CARDIOMETABOLIC RISK ASSESSMENT OF TESTICULAR GERM-CELL TUMOR SURVIVORS

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BACKGROUND AND OBJECTIVES
Testicular germ-cell tumor (TGCT) survivors face increased risk of cardiometabolic complications due to chemotherapy-induced toxicities and potential gonadal dysfunction. The Mediterranean diet (Med Diet), with its cardioprotective and anti-inflammatory properties, represents a promising dietary intervention to mitigate such risks. This study aimed to explore the relationship between Mediterranean diet adherence, triglyceride-glucose index (TyG), and erythrocyte fatty acid (FA) profiles in TGCT survivors.

METHODS
TGCT survivors (n=92, mean age $\bar{x}$=35.89±8.67 years) were recruited for this cross-sectional study. Adherence to the Mediterranean diet was assessed using a validated dietary score (MedDietScore; range 0–55). TyG index was calculated using fasting triglycerides (TG) and glucose (GLU): TyG = ln[TG (mg/dL) × GLU (mg/dL)] / 2. Erythrocyte FA composition was determined using gas-liquid chromatography, and Omega-3 Index (O3I; sum of eicosapentaenoic acid and docosahexaenoic acid, %) was employed as a biomarker of cardiovascular health. Statistical analyses included correlation and multivariate regression to assess associations between MedDietScore, TyG, and erythrocyte FA profile.

RESULTS
Among study participants, 60.87% were classified as overweight or obese (Body Mass Index, BMI ≥25.0 kg/m²), and two-thirds displayed dyslipidemia. Participants demonstrated low-to-moderate adherence to the Mediterranean diet (MedDietScore $\bar{x}$=24.8±5.2). Two-thirds had O3I <4%, indicative of high cardiovascular risk. MedDietScore showed a moderate inverse correlation with TyG index ($r=-0.312$, $p<0.05$) and n-6/n-3 FA ratio ($r=-0.287$, $p<0.05$), while positively correlating with O3I ($r=0.428$, $p<0.01$) and delta-5 desaturase activity ($r=0.366$, $p<0.05$). Regression analysis confirmed that higher MedDietScore was associated with lower TyG values ($\beta=-0.221$, $p=0.047$) and improved FA profiles, even after adjusting for BMI and waist circumference.

CONCLUSIONS
This study highlights the potential role of Mediterranean diet adherence in reducing cardiometabolic risk among TGCT survivors. By synthesizing dietary, anthropometric, and biochemical parameters, it establishes a robust framework for personalized risk stratification and emphasizes the transformative potential of targeted dietary interventions in optimizing health outcomes within this vulnerable population.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO7_169

EXAMINATION OF VITAMIN B1 NUTRITIONAL STATUS, ENERGY METABOLISM, AND PASTE FOODS FORTIFIED WITH VITAMIN B1 FOR FRAIL ELDERLY INDIVIDUALS

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BACKGROUND AND OBJECTIVES

Japan, being a super-aged society, has advanced in elderly nutrition management. The fundamental approach to preventing malnutrition includes nutritional supplementation and dysphagia-adjusted diets. Among these, paste foods, which involve adding water and blending pre-cooked meals, may result in lower nutritional efficiency per unit weight or volume. Furthermore, water-soluble vitamins in paste foods are known to be prone to significant loss during heating. This study focuses on Vitamin B1, a coenzyme involved in energy metabolism and aims to report on the Vitamin B1 nutritional status of frail elderly individuals. The study also proposes a cooking method for paste foods that enhances energy density while fortifying Vitamin B1, which is essential for energy metabolism

METHODS

The study involved 87 frail elderly individuals, whose whole blood Vitamin B1 levels were tested. Individuals with levels of 0.2 μg/dL or lower were categorized as Vitamin B1 deficient. Multivariate logistic regression analysis was performed to explore related factors. Subsequently, the study examined the "zero-water cooking method," which is increasingly being adopted in Japanese facilities to enhance the energy density of paste foods. Vitamin B1 was added to rice jelly, and the retention of Vitamin B1 was evaluated. Additionally, the nutrient content of paste food made using Vitamin B1-fortified rice jelly was assessed

RESULTS

Of the 87 frail elderly individuals surveyed, 18 (20.7%) had Vitamin B1 deficiency. Seventeen individuals (19.5%) consumed paste food. The multivariate-adjusted odds ratio (95% confidence interval) for Vitamin B1 deficiency in those consuming paste food was 6.978 (1.038–49.924), $p = 0.046$, indicating a significantly higher risk compared to those consuming other types of food. Nutrient analysis of the rice jelly used in the zero-water cooking method showed approximately 70 kcal per 100g, with no detectable Vitamin B1. However, after fortifying the rice jelly with Vitamin B1, approximately 0.16 mg of Vitamin B1 remained. Without fortification, the energy intake from the paste food did not meet the estimated average required intake of Vitamin B1 (0.45 mg/1,000 kcal) as defined by the 2020 Japanese Dietary Reference Intakes.

CONCLUSIONS

Frail elderly individuals consuming paste food may be at risk of chronic Vitamin B1 deficiency. The zero-water cooking method using Vitamin B1-fortified rice jelly has the potential to both increase energy density and provide the necessary Vitamin B1 for energy metabolism.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8 - Basic research in nutrition

EPO8_001

THE RELATIONSHIP BETWEEN HOMOCYSTEINE AND URIC ACID IN CARDIOVASCULAR AND METABOLIC HEALTH

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BACKGROUND AND OBJECTIVES
Homocysteine (Hcy) and uric acid (UA) are biomarkers involved in metabolic pathways and have been implicated in cardiovascular disease. Hcy is an amino acid produced from methionine metabolism, while UA is a product of purine breakdown. Elevated levels of both are associated with oxidative stress, endothelial dysfunction and inflammation, contributing to cardiometabolic syndrome [1, 2]. Recent studies suggest a positive correlation between Hcy and UA levels, indicating a shared impact on cardiovascular risk [3]. This study aims to investigate the relationship between Hcy and UA levels and their association with other cardiometabolic parameters, such as BMI, insulin level and HOMA-IR index.

METHODS
We studied 101 patients (pts): 64 women (63,4%) and 37 men (36,6%); mean age 39,3±11,1; mean BMI 29,6±5,7; 44 pts (44,4%) were with obesity. Statistical analysis was based on the chi-square (X^2) test, analysis of variance (ANOVA) and Pearson correlation coefficient.

RESULTS
Among pts with normal Hcy levels (< 11 μmol/l), the mean UA level was 329,5±83,5 μmol/l, while in pts with elevated level of Hcy it was significantly higher - 384.5±78,9 μmol/l (p=0.0104). In the group of pts with normal UA levels: 20% had a normal BMI, 42,5% were overweight and 37,5% had obesity; in the group with elevated UA: no pts had a normal BMI, 22,2% were overweight and 77,8% had obesity (p=0.019). Elevated insulin levels were more frequent in the group with elevated UA levels (27,78%) compared to those with normal UA levels (4,94%) (p=0.002). Statistically significant (p<0.05) moderate positive correlations were found between UA and BMI (r=0.448), insulin level (r=0.3584) and HOMA-IR index (r=0.389).

CONCLUSIONS
Our findings demonstrate an association between Hcy and UA levels. Significant differences in BMI and insulin levels were observed between groups with normal and elevated UA levels. Positive correlations of UA with BMI, insulin level and HOMA-IR index were detected. At the same time, the association between Hcy and other metabolic parameters was less pronounced. Understanding the interaction between Hcy and UA, and mechanisms underlying their association, may provide new strategies for preventing and managing cardiovascular and metabolic diseases.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_002

GLUTEN AND RICE PROTEIN HAVE POSITIVE EFFECTS ON PRESSURE INJURY PREVENTION BY THE SUPPRESSION OF COLLAGEN DEGRADATION

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BACKGROUND AND OBJECTIVES
Protein malnutrition has been shown to inhibit pressure injury healing in elderly people and hospitalized patients. Understanding the molecular mechanisms that protein nutrition affects pressure injury is known to be important for optimal pressure injury healing and prevention. However, the molecular mechanism underlying the alteration of pressure injury healing and prevention by dietary protein sources is not well understood. Therefore, in the present study, we examined the effects of dietary protein sources (casein, gluten and rice protein) on pressure injuries at the molecular level.

METHODS
After C57BL/6J mice were acclimated to a normal diet based on AIN-93G feed composition for 1 week, they were divided into the three following groups: casein, gluten, and rice protein and were fed for 1 week. Dorsal mouse skin was pulled up and trapped between two magnetic plates, and then plates were removed after 24 hours. The wounded skin tissues collected on 24 hours after reperfusion were used for the histopathological and gene expression analyses. Tissue sections were stained with hematoxylin and eosin and Masson's trichrome. We also investigated the effects of dietary casein, gluten and rice protein on the gene expression levels of the inflammatory markers in the wounded skin tissues by quantitative reverse transcription polymerase chain reaction.

RESULTS
The wound areas were significantly smaller in the gluten and rice protein group than those in the casein group at 24 h after reperfusion. The skin tissues of the gluten and rice protein group showed lower amounts of collagen deposition compared with that in the casein group. Interleukin-1β and tumor necrosis factor-α mRNA levels were significantly decreased in the wounded skin of the gluten and rice protein groups compared with that in the casein group.

CONCLUSIONS
It is likely that dietary gluten and rice protein have positive effects on pressure injury prevention by the suppression of collagen degradation and inflammation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_005

PALMITIC ACID DECREASES ADIPONECTIN ACTIVITY, PROMOTES OSTEOCLAST DIFFERENTIATION, AND INCREASES THE RISK OF OSTEOPOROSIS ONSET

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BACKGROUND AND OBJECTIVES
Osteoporosis, a major disease that significantly reduces quality of life (QOL) worldwide, also increases the risk of obesity, diabetes, metabolic syndrome, and non-alcoholic steatohepatitis (NASH). Concurrently, elevated blood levels of palmitic acid have been reported. This increase in palmitic acid associated with obesity, may interfere with the inhibition of osteoclast differentiation and activation with adiponectin, potentially exacerbating the onset of osteoporosis. However, the key intracellular signaling mechanisms involved in the disease progression remain unclear. Here, we aimed to elucidate the relationship and mechanisms underlying the effects of palmitic acid, adiponectin, and its receptor in the development of osteoporosis using an osteoclast differentiation model.

METHODS
We used murine macrophage-like RAW264.7 cells, which are known to differentiate into osteoclasts upon LPS stimulation. Adiponectin or AdipoRon and/or palmitic acid were added to the LPS-stimulated RAW264.7 cells, and after 24 hours, the mRNA expression of MCP-1 and AdipoR1 was analyzed using real-time PCR. As an alternative to adiponectin, AdipoRon, a small-molecule agonist of the adiponectin receptor, was employed for the experiments.

RESULTS
Adiponectin or AdipoRon significantly reduced LPS-induced MCP-1 mRNA expression. However, the suppressive effect of AdipoRon was completely abrogated in the presence of palmitic acid. Additionally, palmitic acid decreased the mRNA expression of the adiponectin receptor AdipoR1. Similarly, AdipoR1 mRNA expression was reduced by the TLR2 agonist. Notably, the effects of palmitic acid and the TLR2 agonist were reversed when treated with a TLR2 inhibitor, resulting in an increase in AdipoR1 mRNA expression.

CONCLUSIONS
These findings suggest that during the onset of osteoporosis, palmitic acid may contribute to the exacerbation of osteoporosis symptoms by suppressing adiponectin receptor expression and weakening adiponectin's activity. From a nutritional perspective, this study highlights the potential for developing preventive and therapeutic strategies for osteoporosis by modulating the types and quantities of dietary fatty acids.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_006

THE EFFECTS OF 1-KESTOSE ON BLOOD CHOLESTEROL, ADIPOSE TISSUE INFLAMMATION, AND GUT MICROBIOTA IN RAT FED A HIGH-FAT DIET

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BACKGROUND AND OBJECTIVES
The gut microbiota plays several crucial roles in health, such as maintaining intestinal homeostasis, regulating energy metabolism, protecting against pathogens, and modulating the immune system. Dysbiosis, an imbalance in the gut microbiota, is linked to various diseases, including inflammatory bowel disease and diabetes. To date, a high-fat diet (HFD) has been reported to cause dysbiosis, and suppressing dysbiosis may contribute to reducing some disease risk. 1-Kestose is a prebiotic consist of sucrose and fructose with a β-2,1 glycosidic bond, and we have previously reported that 1-kestose improves insulin resistance in rats with type 2 diabetes. This study aims to clarify the effects of 1-kestose on blood cholesterol level, adipose tissue inflammation and microbiota during the consumption of HFD.

METHODS
Male Sprague-Dawley rats were divided into two dietary groups: control diet (CD) or HFD. Each group was further subdivided to receive either tap water (–KES) or tap water supplemented with 1-kestose (+KES) throughout the study. The gut microbiota was evaluated using 16S rRNA amplicon sequencing, and mRNA gene expression in the liver and adipose tissue was assessed using RT-PCR. Gut bacterial metabolites in cecal contents were evaluated using LC-MS.

RESULTS
The HFD/–KES group showed a decrease in the cecum butyrate concentrations and an increase in mRNA gene expression of TNF alpha in adipose tissue; however, the intake of 1-kestose inhibited these changes as well increased *Butyricicoccus*, a butyrate-producing bacterium, in the cecum.
The HFD/+KES group also showed significantly reduced blood cholesterol level, and the mRNA gene expression of CYP7A1, a rate-limiting enzyme in bile acid synthesis, was significantly increased in the liver. Additionally, primary bile acids increased and bacteria with the genes encoded bile salt hydrolases, such as *Bifidobacterium*, were increased in the cecum of the rats in HFD/+KES group.

CONCLUSIONS
These RESULTS suggest that 1-kestose helps improve the increased blood cholesterol level and inflammation by feeding of HFD through modulation of the bile acid and short-chain fatty acid metabolism in the gut.

CONFLICTS OF INTERESTS
Yasuyuki Kitaura received research funding from B Food Science Co., Ltd.Yoshihiro Kadota is a employee of B Food Science Co., Ltd.

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EPO8_009

INTERACTION BETWEEN VITAMIN E HOMOLOGS AND VOLUNTARY EXERCISE ON THERMOGENESIS PROMOTION IN SKELETAL MUSCLE OF MICE

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BACKGROUND AND OBJECTIVES

Myokines (secreted from skeletal muscles) are bioactive molecules that regulate the systemic metabolism. The irisin myokine promotes the browning ("beiging") of white adipose tissue and improves thermogenesis. Therefore, factors that increase irisin expression are expected to have the anti-obesity effect. Previously, we showed that combining voluntary exercise with the intake of (the vitamin E homolog) δ-tocopherol tended to increase the thermogenesis-related gene expression in white adipose tissue. However, it remains unclear whether irisin expression is modulated by δ-tocopherol intake. Therefore, here, using mice we investigated if combining voluntary exercise with δ-tocopherol intake enhances irisin expression and promotes thermogenesis, especially in their skeletal muscles.

METHODS

Male C57BL/6J mice (3 weeks old) were divided into four groups as follows: (1) the control group (C-group); (2) the H-group, fed a high-fat/high-sucrose diet; (3) the HD-group, fed a high-fat/high-sucrose diet and δ-tocopherol; and (4) the voluntary exercising HED-group, fed a high-fat/high-sucrose diet and δ-tocopherol. δ-tocopherol was supplemented at a dose of 1,000mg per kilogram of the feed. The mice were fed in this pattern for 8 weeks. The "voluntary exercise" involved running in a rotary device, and the run-length was recorded during the feeding period using a rotary momentum measurement device. At the end of the study period, mice were subjected to overnight fasting before sampling their arterial blood and tissues for further analysis.

RESULTS

The mice in all the studied groups showed similar quadriceps femoris muscle weight. However, the transcription of the irisin gene (*FNDC5*), i.e., the *FNDC5* mRNA levels in the quadriceps femoris muscle tended to be higher in the HED-group than that in the H-group. Further, we measured the transcription of *PGC-1α* and *PPAR-δ* genes, as they regulate irisin expression. *PGC-1α* mRNA expression was significantly higher in the HED-group than that in the HD-group. Furthermore, the expression of *PGC-1α* and *PPAR-δ* mRNAs tended to be higher in the HED-group than that in the control, C-group.

CONCLUSIONS

Thus, we conclude that the interaction between voluntary exercise and δ-tocopherol intake can increase the expression of irisin. Further, we hypothesize that the observed promotion of thermogenesis in white adipose tissue, when voluntary exercise and δ-tocopherol intake are combined, is due to an increase in the expression of the irisin myokine.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_010

TRANSGENERATIONAL EFFECTS OF LIFELONG SUCROSE CONSUMPTION IN MICE

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BACKGROUND AND OBJECTIVES
Chronic sucrose consumption induces metabolic disturbances, including hyperglycaemia, insulin resistance, hypertension, hyperlipidaemia, and weight gain in animal models. However, these findings have limited clinical applicability since most studies use supra-physiological sucrose dose, exceeding 50% of the total energy intake, while average human sugar consumption is around 20%. This study aims to investigate the effects of lifelong chronic sucrose consumption at human-relevant levels on the metabolic health of mice and their offspring.

METHODS
Initial generation (F0) mice, group-caged, were fed *ad libitum* on low (10% kcal, LSD) and high (25% kcal, HSD) sucrose-diet. Subsequent generations (F1 and F2) were produced by crossing LSD and HSD mice. Body composition, food intake, and glucose and insulin tolerance tests, were monitored trimonthly up to 90-week. Lipid profile were tested by ELISA and gene expression related to fatty acids and glucose metabolism was examined by qRT-PCR. Two-tailed t test or two-way ANOVA were used to compare between group differences, with significance set at $p < 0.05$.

RESULTS
There were no significant changes ($p > 0.05$) in the body compositions of F0 mice after 90 weeks on HSD. Both groups did not exhibit glucose intolerance or insulin insensitivity.
Furthermore, the offspring of these F0 mice demonstrated no noticeable metabolic differences at 48-week. This stability across generations raises questions about the potential resilience of both generations to dietary sugar.

CONCLUSIONS
This study suggests that chronic sugar consumption at the end of human relevant levels may not pose the same risks previously assumed, though inter- or multi-generational sugar effects remain inconclusive.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_012

INTERACTIONS BETWEEN DELTA-TOCOPHEROL INTAKE AND EXERCISE ON ADIPOSE TISSUES OF MICE

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BACKGROUND AND OBJECTIVES

Vitamin E is a fat-soluble vitamin present in vegetable oils and nuts; it has eight naturally occurring forms: four tocopherols (α-, β-, γ-, and δ-tocopherol) and four tocotrienols (α-, β-, γ-, and δ-tocotrienol). Recently, vitamin E has been reported to have several novel functions, such as anti-obesity effects. Leptin, a hormone that depends on the adipose tissues, acts on leptin receptors in the hypothalamus to strongly suppress appetite. Vitamin E tends to accumulate in the adipose tissue; however, few studies have reported on its relationship with leptin. Therefore, this study aimed to evaluate the interactions between δ-tocopherol (-Toc) intake and exercise in the adipose tissues of mice.

METHODS

C57BL/6JJcl mice were divided into the control (C), exercise (CE), δ-Toc (CD), and exercise+δ-Toc (CED) groups. In this study, 50mg/kg of α-Toc was included in the diet of the mice in all groups. The CD and CED groups were further given 1,000mg/kg diet of δ-Toc. The mice were individually housed, and the cages for the CE and CED groups were equipped with a wheel and odometer to record exercise during experimental periods. The mice were provided feed and water *ad libitm* for 8 weeks. The mice fasted for 16 h and were then sacrificed under isoflurane anesthesia and their blood and tissue samples were taken for analysis.

RESULTS

The final body weights of the CE and CED groups were significantly lower than those of the C and CD groups. However, no significant difference was observed in the final body weight between the C and CE groups and the CD and CED groups. The fat masses were comparable to the final body weight. Therefore, exercise was found to significantly reduce body weight, and the result was dependent on the reduction in body fat mass. The concentration of leptin in the plasma of the CE and CED groups were significantly lower than those of C and CD groups. However, no effect of δ-Toc intake was observed.

CONCLUSIONS

The RESULTS revealed a significant positive correlation between body fat mass and plasma leptin concentration. However, δ-Toc intake did not affect plasma leptin levels. We plan to examine the gene expression of leptin in epididymal fat and discuss the RESULTS in the future.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_013

NUTRITION KNOWLEDGE, SELF-EFFICACY AND DIETARY PRACTICE IN ARAB COUNTRIES

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BACKGROUND AND OBJECTIVES
Nutrition are crucial factor contributing to the overall health in populations. The objective of the current study was to assess the nutritional knowledge, self-efficacy and practice (KSP) in younger adults across Arab countries.

METHODS
A cross-sectional study was conducted among Arab young aged between 18 and 25 years, living in the Arabian Peninsula, Africa or Eastern Mediterranean countries. A previously validated KSP questionnaire was distributed via online questionnaire. Sociodemographic data was collected.

RESULTS
A total of 2582 participants (1041 M; 1667 F) were included in the study. Knowledge score was significantly higher in Arabian Peninsula region (7.2 ± 1.9) than the Northern Africa region (5.4 ±2.3) and Eastern Mediterranean region (6.7 ± 1.9), ($p<0.01$, $F=173.2$). The Northern Africa region (1.4 ± 0.5) was significantly lower in the average self-efficacy scores than Arabian Peninsula (1.6 ± 0.4) and Eastern Mediterranean region (1.7 ± 0.4) ($p<0.01$, $F=132.3$). The Arabian Peninsula region (10.3 ± 3.9) was significantly lower in practice score than the Northern Africa region (11.4 ± 3.3) and Eastern Mediterranean region (11.8 ± 3.9) ($p<0.01$, $F=30.5$). Good, moderate and poor practice score was in 19%, 39% and 42%, respectively. High level of self-efficacy was associated with age, female, and high knowledge score in Northern Africa.

CONCLUSIONS
Although there is adequate knowledge score in Arab region, healthy nutritional practice needs to improve. Dietary patterns differed significantly across countries included in the study. Self-efficacy was lower in Northern Africa region. Different sociodemographic factors influencing nutritional knowledge, self-efficacy and practice among Arab regions. Nutrition awareness programs needs to be implemented in Arab region to improve nutritional knowledge and healthy dietary practice to improve overall health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_014

ASSESSING DIET QUALITY USING THE VALIDATED SHORT HEALTHY EATING INDEX (SHEI)

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BACKGROUND AND OBJECTIVES
The general health of populations is greatly influenced by nutritional considerations. This study aims to assess diet quality using short version of Healthy Eating Index (sHEI) and explore the relationship between sHEI and socio-demographic factors among young adults in Saudi Arabia.

METHODS
Face validity and content validity were computed as part of the validation process. Cronbach's alpha was performed to test the reliability. A cross-sectional study surveyed 605 young adults aged 18-25. Sociodemographic information and diet quality using sHEI were collected. Total sHEI score, adequacy and moderation score were calculated. The adequacy score reflects the foods that should be consumed in sufficient amounts. The moderation score reflects foods that should be consumed in limited amounts.

RESULTS
The mean content validity values for individual items were acceptable (range: 0.89–0.99) for all items. Cronbach's alpha of the sHEI nutrition scale was 0.81. The total sHEI score in this sample was 45 ± 9 (range 23-74), adequacy score 30 ± 8 (range 13-48), and moderation score 15 ± 5 (range 5-26). Whole fruit was the lowest item in the adequacy component 1.7 ± 1.9. Added sugar was the lowest item in the moderation component 3.3 ± 3.3. Factors influencing sHEI score (total, adequacy and moderation) among a sample of young adults were gender, body mass index, and region ($p<0.05$).

CONCLUSIONS
Diet quality is poor among young adults in Saudi Arabia. Awareness programs and nutrition education is important to focus on foods that need to be consumed in adequate and moderate amount, sustainable nutrition and eating behavior.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_015

THE EFFECTS OF BETAINE ON THE TRANSCRIPTION OF GENES INVOLVED IN LIPID METABOLISM IN PRIMARY RAT HEPATOCYTES

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BACKGROUND AND OBJECTIVES
Betaine is a naturally occurring compound involved in crucial metabolic processes, such as methylation and hepatic lipid metabolism. Previous studies have shown that betaine may affect the expression of genes related to the synthesis, transport, and utilization of lipids. However, these studies were primarily conducted on specific cell lines, such as HepG2, which do not accurately reflect the metabolism of primary hepatocytes. This study aimed to assess the effects of betaine on the transcription of genes involved in lipid metabolism in primary hepatocytes derived from male Wistar rats.

METHODS
Primary hepatocytes from Wistar rats were cultured on collagen-coated twelve-well plates and treated overnight with 0, 5, or 20 mM of betaine. RNA was isolated using Trizol reagent, and reverse transcription was performed using a High-Capacity cDNA Reverse Transcription Kit (Thermo Fisher Scientific, USA). Real time PCR was carried out using a Roche LC480 Light Cycler with TaqMan assays. Statistical analysis was performed using Statistica 12 software.

RESULTS
We comprehensively assessed the effects of betaine on the transcription of the following genes: phosphoenolpyruvate carboxykinase 1 (*Pck1*), peroxisome proliferator-activated receptor gamma coactivator 1 alpha (*Ppargc1*), carnitine palmitoyltransferase 1a (*Cpt1a*), acyl-CoA synthetase long-chain family member 1 (*Acs*), fatty acid-binding protein 1 (*Fabp1*), peroxisome proliferator-activated receptor alpha (*Ppara*), peroxisome proliferator-activated receptor gamma (*Pparg*), and sterol regulatory element-binding transcription factor 1 (*Srebf1*).

CONCLUSIONS
The RESULTS of the study demonstrated that betaine affect the mRNA levels of genes involved in hepatic lipid metabolism, with these effects potentially being dose-dependent.
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CONFLICTS OF INTERESTS
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EPO8_016

ACETIC ACID STIMULATES AMP-ACTIVATED PROTEIN KINASE AND EXPRESSION OF GENES IN HUMAN SKELETAL MUSCLE CELLS

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BACKGROUND AND OBJECTIVES
Previously, we found that acetic acid had effects on the activation of AMP-activated protein kinase (AMPK) and on the expression of GPR43 genes in skeletal muscles of rat. It was appeared that acetic acid functioned as an agent for improving lipid metabolism in the skeletal muscles. In this study, in order to investigate the effect of acetic acid on skeletal muscles of human, acetic acid on the activation of AMPK, GPR43, and the stimulation in expressions of genes and proteins in human skeletal muscle cells were analyzed.

METHODS
Human skeletal myoblasts (SKB-F) cells were differentiation and cultured for 7 days.
Total protein and total RNA were extracted from differentiated SKB-F cells. Protein and gene analyses were performed by Western blotting and quantitative real-time PCR, respectively.

RESULTS
The expression levels of genes (*GPR43*, *mef2a*, *mb*, *ppargc1a*, *cycs* and *sdha*) and proteins (pAMPK, MEF2A and PGC-1α) were elevated in the acetic acid-treated cells. On the other hand, the araA (AMPK inhibiter)-treated cells showed a declining trend in the expressions of some genes and proteins.

CONCLUSIONS
Acetic acid might improve skeletal muscle function in human via activations of GPR43 and AMPK.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_017

SUPPLEMENT USE AND LABEL READING AMONG AMATEUR FITNESS ENTHUSIASTS AT A HIGH INTENSITY INTERVAL TRAINING (HIIT) FACILITY

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BACKGROUND AND OBJECTIVES
With increasing public interest in health and nutrition, supplements have become popular, particularly among recreational exercisers. While legislation exists to regulate dietary supplements, the industry is not monitored as it should be. Public knowledge of dietary supplements is limited, particularly the understanding of and ability to interpret supplement labels. This, together with the shortage of local data, poses a significant concern for public health. Against this backdrop, the study sought to determine the perceptions, beliefs, and practices of amateur fitness enthusiasts in relation to supplement use, label reading, and body composition.

METHODS
A cross-sectional descriptive study with an analytical component was conducted, involving amateur fitness enthusiasts (>18 years) with an active membership at a HIIT facility in Cape Town. Quantitative data were collected using an online, self-administered questionnaire (n=98), and a body composition analysis tool (InBody© 120)(n=32), and presented using descriptive statistics, supplemented with statistical analysis.

RESULTS
Forty-four percent of participants reported having a reasonable supplement knowledge. Only 5.1% used no supplements at all, citing lack of knowledge, perceived lack of necessity, or cost concerns. The remaining majority consumed a supplement in at least one of the four investigated categories: protein and energy- (81.6%), ergogenic- (40.8%), weight management- (25.8%), and multivitamin and mineral -supplements (74.7%). Protein and energy and multivitamin and mineral supplements were most frequently consumed (4–7 times per week) with 57.5% and 69.0% reporting these supplement groups as effective, respectively. Body composition data reflected a mean participant weight of 87.7 kg, skeletal mass of 35.8 kg, body fat percentage of 27.2%, and a body mass index of 28.8 kg/m2. While 51% reported that reading labels when choosing supplements is always important, the RESULTS varied regarding the specific supplement label elements considered when choosing supplements.

CONCLUSIONS
Supplement use was widespread, even among those with limited understanding. Many users demonstrated a fair understanding of supplements; however, clear disparities emerged regarding usage indications, supplement selection, and reliance on unreliable sources for advice. Extensive supplement label education and nutrition consultation are necessary to improve understanding of supplements and to enhance label-reading practices.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_018

ANTIBIOTIC RESISTANCE IN SKIN MICROBIOTA IN TYPE 2 DIABETIC AND HEALTHY SUBJECTS

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BACKGROUND AND OBJECTIVES

The use and misuse of antibiotics around te world has generated in recent years a rapid emergence in the sread of resistant bacteria and resistance genes, which is why the WHO characterized microbial resistance as a global public heath crisis that must be urgently resolved (WHO, 2015). The skin microbiota and the bacteria that compose it are the first to be exposed to different sources of these drugs (Jo, 2021), the extent of their resistance, and their impact on the health of the individuals are questions to be resolved. Objective: To evaluate antibiotic resistance in skin microbiota in compensated and decompensated subjects with type 2 diabetes and in healthy subjects.

METHODS

20 adults subjects with type 2 diabetes (T2D) with HbA1c greater than 7% considered as decompensated, HbA1c less than 7% considered as compensated and healthy subjects were evaluated. A sample for culture was obtained by scraping the skin with a swab from the plantar area (Timm, 2020), then a phenotypic determination was performed using Chromagar, performing antibiotic sensitivity test by applying sensidiscs for amoxicilin and clavulonic acid (AUG) and cefadroxil (Khan, 2023). FInally, the isolates were sequenced at SeqCenter.

RESULTS

A significant difference was observed in the age of the subjects, with the healthy ones being younger (ANOVA, p=0.01). Healthy subjetc were foud to have a skin microbiota with greater resistance to AUG (47.3%), also, compensated a decompensated T2D subjects were more sensitive to AUG than healthy individuals (57.1% and 61.0%, respectively, vs 27.3%). regarding Cefadroxil, it was also observed that compensated and decompensated T2D were more sensitive than healthy subjects (45.5% and 52.3%, respectively, vs 9.1%), about resistance of Cefadroxil, 47% of the healthy subjects were resistant. The species found differ according to the metabolic state whether they are resistant or not.

CONCLUSIONS

Healthy subjects without antibiotic consumption present resistance in their skin microbota and also the species differ according to the presence of sensitivity or resistance. In diabetic subjects, the resistance of bacteria is related to metabolic control as well as the species present. It is necessary to study what effect this finding has on the health of individuals.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_019

VITAMIN D3 IS MORE EFFECTIVE IN IMPROVING THE SKELETAL FUNCTIONS THAN VITAMIN D2 IN A RAT MODEL

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BACKGROUND AND OBJECTIVES

Vitamin D (VD) deficiency is widespread globally and VD fortification is being implemented in many countries. In certain countries, like India, VD2 is a more popular fortificant than VD3 owing to vegetarianism and cultural reasons. The structural differences in the side chains of VD2 and VD3 directly affect their metabolism, with VD3 showing a greater half-life than VD2. Therefore, the present study was designed to decipher the role of the two vitamers (VD2 vs VD3) when used independently or in combination at different levels in impacting the functions of the classical target organs (intestine, bone and kidney).

METHODS

Weanling male SD rats were fed either VD3 (400IU or 2000IU/kg) or VD2 (400IU or 2000IU/kg), or a combination of both vitamers (1000IU+1000IU/kg) or VD-deficient (0IU/kg) diets for 18-weeks. VD-depleted rats were rehabilitated with the same diets from 9th week, to assess reversal of effects. Serum parameters were analyzed using HPLC, ELISA and Atomic Absorption/UV-Vis-Spectrophotometry. 45Ca isotope was used to check fractional calcium absorption by Liquid Scintillation Counting. Bone quality was assessed by DEXA, Digital Force Tester, and histopathological analyses. Expression of genes involved in calcium absorption, reabsorption and VD metabolism were analyzed using RT-qPCR.

RESULTS

Serum 25(OH)D and calcium levels were significantly decreased, whereas PTH and ALP levels were significantly increased in the VD-deficient group compared to groups given either VD2 or VD3. A ~2-fold increase in 25(OH)D level was observed in VD3-fed groups than in VD2-fed groups, and concurrent supplementation of VD2 with VD3 had a declining effect on 25(OH)D. A trend of higher intestinal calcium absorption was observed in the groups fed VD3 than VD2-based diets (P<0.01). VD3 appeared to be more efficacious (P<0.01) than VD2 in improving bone mineral content, bone strength, articular cartilage thickness and collagen deposition, especially upon rehabilitation. Furthermore, VD3-fed groups exhibited a higher expression of *CaBP9k* and *Vdr* in the small intestine. Also, VD3 was more efficacious in improving *Trpv5*, *CaBP28k* and *Pmca1b* expression in kidney. A similar trend was observed in renal *Cubilin*, *Cyp27b1* and *Vdr* expression.

CONCLUSIONS

VD3 improved serum 25(OH)D levels and skeletal functions more efficiently than VD2, especially during the rehabilitation phase. VD3 could be a better alternative to VD2 for food fortification and supplementation programs.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_020

EFFECTS OF CYSTINE ON THE REPRODUCTIVE ORGANS OF RATS WITH DISTURBED CIRCADIAN RHYTHMS

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BACKGROUND AND OBJECTIVES
Men with disrupted circadian rhythms often exhibit reduced sperm counts and increased infertility risks. This study aims to clarify the effects of cystine supplementation on the reproductive organs of rats subjected to circadian rhythm disturbances

METHODS
Three-week-old male Fischer 344 strain rats were divided into four groups based on light–dark conditions and diet: normal light–dark cycle (light phase: 07:00–19:00) with a 9% casein diet (N9%), normal light–dark cycle with a cystine-supplemented diet (NCys), disturbed light–dark cycle with a 9% casein diet (D9%), and disturbed light–dark cycle with a cystine-supplemented diet (DCys). The disturbed light–dark cycle involved two protocols: in Experiment 1, the 24-h light–dark cycle was advanced by 8 h every 4 days; in Experiment 2, 8-h and 5-h light–dark cycles were alternated weekly. After 4 weeks, the rats were dissected between 13:00 and 15:00.

RESULTS
In Experiment 1, cystine supplementation increased body and reproductive organ weights, with no effects observed from the disturbed light–dark cycle. In Experiment 2, cystine supplementation raised body weight, whereas the disturbed light–dark cycle lowered this weight. Testis weight (g) in the D9% group was reduced compared to the DCys group. Serum testosterone levels remained unaffected by either cystine supplementation or the disturbed light–dark cycle. However, mRNA expression levels of Scarb1, Star, Cyp17a, and Hsd17b, key enzymes in testosterone synthesis, were significantly lower in the disturbed groups. Notably, Hsd17b mRNA expression significantly increased with cystine supplementation. Expression levels of Ldlr, Scp2, and Cyp11a mRNA were reduced in the D9% group compared with the N9% group, but no differences were observed between the DCys and NCys groups. The mRNA levels of Insl3, a marker of Leydig cell differentiation responsible for testosterone synthesis, were lower in the disturbed groups, with no detectable effect of cystine supplementation.

CONCLUSIONS
Weekly alternation between 8-h and 5-h light–dark cycles reduced mRNA expression levels of enzymes involved in testosterone synthesis. Cystine supplementation increased Hsd17b3 mRNA expression levels, promoting the conversion of androstenedione to testosterone. These RESULTS were observed 6–8 h and 0–2 h into the light phase for the normal and disturbed groups, respectively. Therefore, future research should consider the secretion rhythms of related hormones when interpreting these findings.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_021

AMARANTH EXTRACTS REGULATE MITOCHONDRIAL BIOENERGETICS IN C2C12 MYOTUBES AND PRIMARY HEPATOCYTES

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BACKGROUND AND OBJECTIVES

Amaranth, a pseudocereal native to Mexico, was a staple food of Mesoamerican civilizations (1). Supplementation with amaranth reduces hepatic cholesterol, triglycerides, and phospholipid levels in mice fed a high-fat diet (2), and its seed extracts improve glucose tolerance and insulin secretion in both type 2 diabetic (Goto-Kakizaki) and healthy Wistar rats (3). Despite these effects on lipid and glucose metabolism, the underlying mechanisms, particularly those involving mitochondrial function, remain unclear. This study aimed to evaluate the polyphenol content of four amaranth grain extracts and investigate their effects on mitochondrial function.

METHODS

Amaranth grains were obtained from two distinct sources: artisanal and commercial. Four extracts were prepared from each source: methanol extract (ME), 100% ethanol extract (EE100), 70% ethanol extract (EE70), and acetone extract (AE). The total polyphenol content was quantified using the Folin–Ciocalteu method. The effects of 2 nM gallic acid equivalents of each extract on mitochondrial bioenergetics were assessed in C2C12 myotubes and primary hepatocytes using an extracellular flux analyzer and a mitochondrial stress test.

RESULTS

The total polyphenol content was 117% and 77% higher in the ME and EE100 from artisanal amaranth compared to the commercial extracts. In contrast, the EE70 and AE from commercial amaranth contained 137% and 72.82% higher polyphenol levels than the artisanal extracts. In C2C12 myotubes, the ME, EE100, and AE from artisanal amaranth significantly enhanced maximal respiration and spare respiratory capacity. Similarly, EE100 and EE70 increased maximal respiration and spare respiratory capacity in primary hepatocytes. For commercial amaranth, ME and EE70 improved maximal respiration and spare respiratory capacity in primary hepatocytes, while EE100 and EE70 enhanced these parameters in C2C12 myotubes.

CONCLUSIONS

This study demonstrates that the source and extraction method significantly influence the polyphenol content and bioenergetic effects of amaranth grain extracts. Artisanal extracts showed greater potential in enhancing mitochondrial function in C2C12 myotubes, whereas commercial extracts were more effective in primary hepatocytes. The current work was supported by the Periodic Table of Food Initiative and the FOODEDU Good Food Fellows initiative through the American Heart Association.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_022

ENERGY CONSUMPTION TIMING AND ITS ASSOCIATION WITH OVERWEIGHT AND OBESITY AMONG UNIVERSITY STUDENTS: A PILOT STUDY

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BACKGROUND AND OBJECTIVES
Food timing is a modifiable behavioral factor linked to overweight and obesity. This pilot study aimed to investigate the relationship between daily energy consumption timing and the prevalence of overweight and obesity among female university students.

METHODS
A pilot study was conducted involving female university students. Participants completed an online questionnaire to gather sociodemographic and lifestyle data. Anthropometric measurements were recorded, and dietary intake was assessed using 24-hour food recalls across three non-consecutive days. Statistical analyses, including ANOVA and T-tests, were employed to examine the relationship between energy consumption timing, body mass index and waist circumference.

RESULTS
A total of 47 participants were included in the analysis, categorized based on BMI and waist circumference. Obese and overweight participants had a higher total daily energy intake (1717 ± 721 kcal/day) compared to those with normal BMI (1529 ± 694 kcal/day). Additionally, obese and overweight individuals, as well as those with abdominal obesity, primarily consumed their daily energy intake at night. However, no statistically significant associations were observed between energy intake timing (day vs. night) and BMI or waist circumference.

CONCLUSIONS
The findings indicate that daily energy consumption timing is not significantly linked to overweight and obesity among female university students. The small sample size highlights the need for larger studies, and further exploration of food timing's relationship with overweight and obesity, particularly through randomized controlled trials, is recommended to establish causal links.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_024

THE EFFECT OF PROTEIN RESTRICTION ON THE GUT ENVIRONMENT IN HIGH-FAT DIET-FED MICE

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BACKGROUND AND OBJECTIVES
Carbohydrates, proteins, and fats are essential macronutrients required for energy and physiological processes. There is growing evidence that the balance between protein and non-protein energy in the diet is more critical for health and aging than the individual effects of each macronutrient. Dietary protein restriction, in particular, has shown benefits for metabolic health and weight management, especially in comparison to high-fat diets. In addition, macronutrient balance also modulates the gut environment, which has been linked to host health and disease. This study thus aims to investigate how protein restriction affects the gut environment in mice fed a high-fat diet.

METHODS
C57BL/6N male mice were divided into three groups, each fed a different diet: control diet (CD), high-fat diet (HFD), or high-fat low-protein diet (HFLPD). After two weeks of rearing, tissues were collected, and microbiota composition and metabolites were analyzed using 16S rRNA amplicon sequencing, gas chromatography-mass spectrometry (GC-MS), and liquid chromatography-mass spectrometry (LC-MS).

RESULTS
Mice in the HFD group showed increased levels of potentially harmful cecal metabolites, including branched-chain amino acids (BCAAs) and aromatic amino acids (AAAs), as well as secondary bile acids (BAs), compared to the CD group. This was accompanied by a rise in *Lachnospiraceae*, a bacterial family known to produce secondary BAs. These metabolites were notably reduced with protein restriction in the HFLPD group, which also exhibited lower levels of cecal long-chain fatty acids compared to the HFD group.

CONCLUSIONS
These findings indicate that restricting protein during high fat intake modulates gut microbiota composition, reduces harmful metabolites, and may influence fat digestion or absorption. This highlights the potential of protein restriction as a dietary strategy, particularly in high-fat diets, to improve gut health and reduce the risk of diseases.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_026

THE BENEFICIAL EFFECTS OF GABA-FERMENTED RICE BRAN ON CAFETERIA DIET-INDUCED NON-ALCOHOLIC FATTY LIVER DISEASE IN RATS

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BACKGROUND AND OBJECTIVES
Non-alcoholic fatty liver disease (NAFLD) is a common liver disorder strongly influenced by dietary factors. Functional foods like fermented rice bran, rich in bioactive compounds such as γ-aminobutyric acid (GABA), have shown potential in improving metabolic disorders. However, the effects of GABA-fermented rice bran on NAFLD remain unclear. Therefore, in this study, we aimed to investigate whether GABA-fermented rice bran exhibits beneficial effects on cafeteria diet induced NAFLD in rat model.

METHODS
40 male Wistar rats were divided into four groups: a normal diet group (C), a normal diet group supplemented with 300 mg/kg body weight GABA-fermented rice bran (CG), a cafeteria diet group (CAF), and a cafeteria diet group supplemented with 300 mg/kg body weight GABA-fermented rice bran (CAFG). After 16 weeks, rats were sacrificed to collect samples for further analysis.

RESULTS
After a 16-week cafeteria diet, the rats exhibited significantly higher body weight, perirenal and epididymal adipose tissue weight compared to the control group, whereas the GABA-fermented rice bran group showed significantly lower levels than the cafeteria group. The cafeteria diet significantly elevated blood glucose and HOMA-IR levels, but these were not notably reduced by GABA-fermented rice bran treatment. Additionally, plasma triglyceride levels, which were significantly increased by the cafeteria diet, were markedly reduced by GABA-fermented rice bran treatment. In contrast, the cafeteria diet significantly increased hepatic triglyceride levels, but GABA-fermented rice bran showed no significant effect.The cafeteria diet also increased plasma leptin and adiponectin levels compared to the control group, but these changes were reversed by GABA-fermented rice bran treatment. Regarding inflammatory response, the cafeteria diet significantly raised hepatic TNF-α levels, which were ameliorated by GABA-fermented rice bran. Histopathological liver analysis revealed that the cafeteria diet induced hepatic lipid accumulation and resulted in a significantly higher NAFLD score than the control group, whereas GABA-fermented rice bran reduced both lipid accumulation and NAFLD scores.

CONCLUSIONS
GABA-fermented rice bran alleviated the metabolic and inflammatory effects of cafeteria diet-induced NAFLD, by means of reducing body weight, adipose tissue weight, plasma triglycerides, and inflammation. These findings suggest that GABA-fermented rice bran can be a promising dietary intervention for NAFLD.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_028

EARLY REGULATION OF INTESTINAL CALCIUM TRANSPORT IN RESPONSE TO FEEDING STIMULATION

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BACKGROUND AND OBJECTIVES

Transcellular calcium transport in the small intestine is a predominant pathway to sustain calcium homeostasis when dietary calcium intake is insufficient. This pathway is initiated by increasing the expression of TRPV6, a calcium channel in intestinal epithelial cells, due to vitamin D action, and allows calcium entry into cells. While it has well been demonstrated that vitamin D action promotes calcium absorption in response to biological requirements, dietary calcium intake affects vitamin D action too. However, it is unclear whether this change is the result of endocrine regulation in response to the biological requirement or the consequence of changes in the luminal calcium content. In this study, we investigated the early response of intestinal calcium transport to dietary calcium intake.

METHODS

To elucidate the early response, wild-type (*Int Vdr+*) mice and mice lacking VDR activity in the intestine (*Int Vdr-*) mice at age 10-38 weeks were acclimated by repeating 24 hours fasting and 1 hour feeding with a control diet for 2 days. After a 2-day acclimation period, *Int Vdr+* and *Int Vdr-* mice fed a control diet that contained 0.5% calcium or a high-calcium diet that contained 1.0% calcium for 30 or 60 minutes. Blood and intestine samples were isolated before feeding, 30 and 60 minutes after feeding.

RESULTS

Serum glucose levels tended to increase 30 minutes after feeding, but serum calcium levels were not affected by feeding time and remained low compared to the levels of normal feeding status. TRPV6 protein expression in the small intestinal epithelium, assessed by western blot analysis, was increased in both *Int Vdr+* and *Int Vdr-* mice after 30 minutes of feeding. Besides, the signal of epithelial localization of TRPV6 was increased in *Int Vdr+* mice in a time-dependent manner, these signals were not abundantly detected in *Int Vdr-* mice, and no change with feeding time. Furthermore, the luminal calcium concentration in the small intestine did not change from before feeding till 60 minutes after feeding.

CONCLUSIONS

These RESULTS suggest that in the early phase after feeding, a mechanism that regulates calcium absorption by increasing TRPV6 expression in the intestinal epithelium responds to feeding, and this mechanism is promoted by vitamin D action.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_029

EFFECT OF DIETARY CALCIUM DEFICIENCY ON ZINC LEVELS AND ZINC TRANSPORTERS ACROSS MULTIPLE TISSUES IN RATS

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BACKGROUND AND OBJECTIVES

Calcium is a vital mineral in the body, playing a critical role in numerous physiological processes. Its deficiency not only impairs skeletal integrity but also affects the metabolism and distribution of other essential minerals, such as magnesium and iron. Although our findings demonstrated that dietary zinc deficiency reduces serum calcium levels and impairs calcium utilization, leading to bone loss, limited research has addressed how dietary calcium deficiency affects zinc distribution in tissues.

In this study, we investigated the effects of dietary calcium deficiency on zinc concentrations and zinc transporter expression in the liver, kidney, and duodenum.

METHODS

After a 3-day adaptation to a control diet, four-week-old male Wistar rats were divided into two groups: a calcium-deficient group (CaD, 500 ppm) and a control group (C, 5000 ppm), pair-fed with the CaD group. Following two weeks of treatment, the rats were anesthetized, and blood, liver, duodenum, kidney, and femur samples were collected.

RESULTS

Our findings revealed that dietary calcium deficiency significantly increased zinc concentrations in the serum, liver, and femur, while reducing it in the kidney. Additionally, dietary calcium deficiency upregulated metallothioneins (Mt1, Mt2) and Zip1 in the liver but downregulated Mt1, Mt2, Zip1, Zip10, Zip13, and Zip14 in the kidney. In the duodenum, Mt1, Mt2, and ZnT1 expression increased, while Zip4 expression was significantly reduced.

CONCLUSIONS

These RESULTS indicated that dietary calcium deficiency altered zinc distribution across tissues by modulating the expression of zinc transporters, suggesting a complex interaction between calcium and zinc homeostasis in the body.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_030

EFFECT OF ORAL INTAKE OF LINSEED OIL ON FATTY ACID METABOLISM-RELATED GENES IN THE SKIN OF OBESE MICE

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BACKGROUND AND OBJECTIVES

Obesity impairs skin barrier function and causes epidermal thickening (Mori et al., 2017; Horie et al., 2018). The impaired skin barrier function leads to a vicious cycle of itching and scratching, which further deteriorates skin barrier function and reduces quality of life. However, there are no established care methods for skin barrier dysfunction in obesity. We previously demonstrated that oral intake of linseed oil, which is rich in omega-3 fatty acids, inhibits skin barrier dysfunction in obesity (Horie et al., 2024). This study aims to elucidate, using molecular biological analysis, the effect of oral intake of linseed oil on fatty acid metabolism-related genes that are decreased in obese skin.

METHODS

Obese model mice (TSOD) were divided into Control and Omega groups. The Control group received sterile distilled water, and the Omega group received linseed oil orally for 8 weeks. After hair removal, UVB irradiation (40 mJ/cm2) was applied to the dorsal skin. Transepidermal water loss (TEWL) was measured, and skin samples were collected. Histological analysis was performed using hematoxylin-eosin (HE) staining, and mRNA expression levels of fatty acid metabolism-related genes were analyzed. This study was approved by the Yokohama City University Animal Experiment Committee (F-A-23-051).

RESULTS

The Omega group exhibited significantly lower TEWL values compared to the Control group. Histological analysis revealed that epidermal thickening was suppressed in the Omega group. Molecular biological analysis demonstrated that mRNA expression levels of *Acc1* and *CerS1*, *3*, and *6*, key enzymes involved in free fatty acids and ceramide synthesis, were significantly decreased in the Omega group compared to the Control group.

CONCLUSIONS

This study suggests that the suppression of skin barrier dysfunction in obese mice receiving linseed oil is associated with the modulation of fatty acid synthase enzymes. Compared to the Control group, in which the skin barrier function was impaired, gene expression of free fatty acids and ceramide synthase was decreased in the Omega group. This indicates that linseed oil suppressed the impaired barrier function in obese skin, as gene expression of the synthases was modulated in the Omega group. Further investigations into omega-3 fatty acid metabolites and other skin barrier-related factors are required to establish preventive care methods for obesity-related skin barrier dysfunction.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_031

ETHYL P-METHOXYCINNAMATE SUPPRESSES EHRLICH ASCITES TUMOR CELL PROLIFERATION VIA ATP DEPLETION THROUGH INHIBITION OF FATTY ACID SYNTHESIS RATHER THAN GLYCOLYSIS

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BACKGROUND AND OBJECTIVES
Cancer cells exhibit reprogrammed energy metabolism pathways, yet the primary mechanisms for meeting their energy demands remain poorly understood. Ethyl *p*-methoxycinnamate (EMC), a major component of the ginger plant *Kaempferia galanga* L., inhibits the proliferation of Ehrlich ascites tumor cells (EATCs) by inducing G1 phase arrest. This study aimed to examine the effects of EMC on energy metabolism pathways, particularly glycolysis and fatty acid metabolism, to gain deeper insights into the interactions between metabolic pathways in cancer cells.

METHODS
EATC were incubated with or without 100 μM EMC. Anti-cancer effects of EMC were evaluated by measuring glucose consumption, lactate release, ATP levels, mRNA and protein expression, intracellular triglyceride (TG) levels, DNA content, cell viability, and cell number.

RESULTS
EMC treatment significantly decreased ATP levels in EATCs, despite enhancing glycolytic activity, as evidenced by increased glucose consumption and lactate release in the culture medium. EMC inhibited the expression of fatty acid synthesis-related genes and decreased intracellular TG levels. Notably, the exogenous addition of palmitic acid reversed the EMC-induced decrease in ATP levels. These RESULTS demonstrate that EMC reduces ATP levels by inhibiting fatty acid synthesis. EMC-induced ATP depletion coincided with the inhibition of the G1/S phase transition. Furthermore, EMC reduced the number of EATCs, but this reduction was reversed by the addition of exogenous palmitic acid. These RESULTS suggest that the reduction in ATP production caused by the inhibition of fatty acid synthesis disrupts energy-dependent cell cycle progression, thereby suppressing EATC proliferation. Mechanistically, EMC suppressed the expression of SREBP1, a master regulator of fatty acid synthesis, and further inhibited the Ser62 phosphorylation of c-Myc, a transcriptional regulator of SREBP1. These findings indicate that EMC suppresses the expression of fatty acid synthesis-related genes through the inhibition of the c-Myc/SREBP1 pathway.

CONCLUSIONS
This study demonstrates that EMC suppresses ATP production in EATCs by inhibiting *de novo* fatty acid synthesis rather than glycolysis. These findings underscore the critical role of fatty acid metabolism in maintaining energy homeostasis in cancer cells and identify fatty acid synthesis as a promising therapeutic target for cancer treatment.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_032

D-TOMATO ADVENTURE: CAN A BOWL OF SOUP BOOST YOUR VITAMIN D LEVELS?

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BACKGROUND AND OBJECTIVES
Vitamin D3 is essential for various cellular and bodily functions. While sunlight triggers its synthesis, dietary intake or supplementation is the most reliable way to meet recommended levels. Most plant-based foods are poor sources of vitamin D although they would play a crucial role in curbing deficiency as they are widely consumed and affordable. Recent research has developed tomato lines that accumulate pro-vitamin D3, which can convert to vitamin D3 through UV or sunlight exposure. By editing the cholesterogenesis pathway using CRISPR-Cas9 to knock out the *Sl7dr2* gene, these pro-vitamin D3 enriched tomatoes can achieve an average accumulation of 2 µg/g. This means that five biofortified tomatoes can meet the recommended daily intake of 10 µg of vitamin D.

METHODS
To investigate the bioavailability and efficacy of the biofortified tomatoes in maintaining plasma 25-OHD levels, tomato soups were made from the biofortified tomatoes to be consumed by healthy volunteers in a four arm, double blind study conducted in UK winter. For the food development, 200 tomato plants were grown to meet the required numbers for the study which yielded 300kgs of fresh weight tomatoes. Fresh and freeze dried tomatoes were exposed to UVB or UVC light for 2 hours to convert pro-vitamin D to vitamin D. The clinical study has just been approved and set to take place in January for a period of three weeks.

RESULTS
UVB was more effective than UVC in converting provitamin D to vitamin D in tomatoes. The levels of vitamin D can be increased by incubating the tomatoes at 50C overnight after UV irradiation. Fresh and freeze dried materials can be equally irradiated. Provitamin D and vitamin D are stable in storage at 4C and room temperature which is ideal for the participants during the study.

CONCLUSIONS
This study shows that biofortification of tomatoes with vitamin D could provide a route to curbing the prevalent vitamin D deficiency. The food development studies have shown that it is feasible to standardise the amounts of vitamin D provided by the tomatoes for a human study and UVB is more effective in conversion of provitamin D to vitamin D. The next steps are the recruitment for the human study.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_033

MODULATION OF LIPID HOMEOSTASIS BY VITAMIN E ANALOGUES AND CANNABINOIDS IN HUMAN MACROPHAGES

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BACKGROUND AND OBJECTIVES

An imbalance of lipid homeostasis is considered as one of the factors of chronic inflammation. Excess lipid can activate CD36 scavenger receptor/fatty acid translocase (CD36/FAT) and Toll-like receptor (TLR2/TLR4) in macrophages resulting in accumulation of lipids and increased production of inflammatory cytokines such as IL6 and TNFα. Cannabinoids are known to modulate inflammation and lipid homeostasis in macrophages, by regulating cannabinoid receptors (CB1, CB2) but also other receptors such as transient receptor potential of vanilloid subtype 1 (TRPV1). Cannabinoid type 1 (CB1) receptor plays a role in lipid regulation and is considered as an important target in metabolic disease.

METHODS

To investigate the molecular mechanisms involved in modulation of lipid homeostasis and inflammation by cannabinoids, we analyzed the expression of lipid transport genes (CD36, SR-B1 ABCA1/G1 transporter) at mRNA (RT-qPCR) and protein (ELISA) levels. We tested whether vitamin E as a lipid-soluble antioxidant with anti-inflammatory and metabolic regulatory properties can modulate these events. By transfecting reporter plasmids for NFκB, PPARγ and Nrf2 into cell lines expressing CB1 or TRPV1 receptors, we assessed whether cannabinoids with/without vitamin E can change these signaling pathways. We tested both natural (αTAn) and synthetic forms (αTAr) of vitamin E acetate for their influence on ROS, toxicity, and cell proliferation.

RESULTS

The cannabinoid, Δ9-tetrahydrocannabinol (THC), increased the levels of lipids in THP-1 macrophages and increased the expression of IL6, IL1β, and TNFα genes at mRNA and protein level. THC also induced NFκB expression via CB1 receptor that could be inhibited by vitamin E. Treatment with the cannabinoid, cannabidiol (CBD), also showed upregulated PPARγ promoter activity via TRPV1 receptor. Our RESULTS suggest induction of genes involved in lipid uptake (CD36/FAT) after treatment with THC that can be prevented, albeit incompletely, by αTA or CBD. Interestingly, genes involved in cellular lipid export (SR-B1, ABCA1) were downregulated less by αTAn when compared to αTAr. Vitamin E has similar inhibitory effects on pro-inflammatory cytokines induced by THC via CB1 receptor as observed for lipid related gene modulation.

CONCLUSIONS

A detailed analysis of the molecular signaling mechanisms by which lipids accumulate in macrophages will not only be important to understand chronic inflammation but also for metabolic dysfunction in diseases such as atherosclerosis.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_035

ASSOCIATIONS OF FOOD CHOICES, FOOD REWARD, AND EATING BEHAVIOR WITH MECHANICAL AND NERVOUS GASTRIC FUNCTIONS IN OBESITY AND BARIATRIC SURGERY: AN ARTIFICIAL INTELLIGENCE ASSISTED SCOPING REVIEW

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BACKGROUND AND OBJECTIVES

The hormonal causes of the alterations in dietary behaviour (e.g., food intake, food reward, gustation, olfaction, disordered eating such as binge eating or emotional eating) sometimes observed in the context of obesity and after bariatric surgery (BS) have been extensively studied. Yet, it remains poorly understood how alterations to the gastric structure may also contribute to these changes in dietary behaviour. The aims of this scoping review were (a) to explore the associations between mechanical and nervous gastric functions and parameters of dietary behaviour such as food intake, food reward, gustation, olfaction and disordered eating in people with obesity or those who had BS, and (b) to provide a comprehensive overview of the assessment tools used to explore mechanical and nervous gastric functions and parameters related to dietary behaviour.

METHODS

Using PRISMA guidelines, we performed a scoping review of studies that concurrently studied mechanical or nervous gastric functions and parameters of dietary behaviour. Studies of interest could include participants of all ages, with obesity or after BS. Both observational and interventional studies were considered. The search was undertaken in MEDLINE, Embase, PsycINFO, CINAHL, Web of Science, Google Scholar, and grey literature. The first screening based on abstracts and titles was conducted with an AI-assisted tool, ASReview.

RESULTS

Eighteen studies were selected, with only one study focusing on BS. An extensive array of methodologies was used to investigate a variety of gastric functions and dietary behaviours, with no study exploring gustation or olfaction. This considerable heterogeneity limits the ability to make firm CONCLUSIONS on the associations between gastric functions and dietary behaviour. However, in the context of obesity, gastric capacity, consumption to achieve satiation and gastric emptying speed were positively associated with binge eating or emotional eating, and with the consumption of carbohydrates. Gastric electrical activity was positively associated with fibre consumption. Interventions to re-educate gastric interoception (perception of hunger and satiety sensations), or to increase gastric electrical activity appeared to reduce overeating behaviours and food cravings.

CONCLUSIONS

Given the limited number and the heterogeneity of existing studies, certain associations between gastric mechanical and nervous functions and dietary behaviour in the context of obesity remain inconclusive. Our scoping review highlights the critical necessity for the development of novel studies in this field, particularly within the domain of BS.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_037

THE PARTIAL REPLACEMENT OF ANIMAL-BASED PROTEINS WITH PLANT-BASED PROTEINS ALTERS AMINO ACID INTAKE AND SOURCES IN HEALTHY ADULTS: A RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
The dietary shift towards more plant-based protein sources may change both the intake and the sources of amino acids. The aim of this study was to investigate the amino acid and protein intakes and their main sources in diets differing in plant/animal-based protein ratios.

METHODS
The study was a randomised controlled trial (RCT) including three intervention diets: ANIMAL, 50/50, and PLANT, with animal to plant protein ratios of 70:30; 50:50; 30:70. Altogether 136 healthy adult participants completed the 12-week RCT. In the 50/50 and PLANT groups, meat and dairy products were partially replaced with grains, nuts, seeds, and legumes. Amino acid and protein intakes (mg/kg body weight) and their sources were analysed based on 4-day food records. Eighteen different food categories were used to analyse amino acid sources in diet.

RESULTS
Intakes of protein, isoleucine, leucine, valine, histidine, and threonine were higher in the ANIMAL group than in the 50/50 and PLANT groups ($p<0.001$). Lysine and methionine intakes differed between all the diet groups with the highest intake in the ANIMAL group and lowest in the PLANT group, and tryptophan intake was higher in the ANIMAL group than in the PLANT group ($P<0.01$). The average requirements of the essential amino acids were met in all participants, apart from the methionine intake in two participants in the PLANT group. In the ANIMAL group, meat, milk, and cereals were the main sources of protein and amino acids. In the 50/50 group, in addition to the above-mentioned ones, legumes were also an important source of protein and amino acids. Nuts and seeds were also among the most important sources of protein and amino acids in the PLANT group. Unlike milk in the ANIMAL and 50:50 groups, plant-based dairy substitutes did not emerge as a significant protein source in the PLANT group.

CONCLUSIONS
When animal-based proteins were partially replaced by plant-based proteins, intakes of protein and essential amino acid were lower although the average requirements of the essential amino acid intakes were met in all diet groups when the protein intake was above the WHO/FAO reference intake (0.83 g/kg). Legumes in the 50/50 group, and in addition nuts and seeds in the PLANT group became an important source of protein and amino acids, besides the more traditional ones in ANIMAL group. However, plant-based dairy substitutes did not seem to replace milk as one of the most important sources of protein and amino acids.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_040

EFFECTS OF A HIGH-FAT DIET LOAD ON THE FUNCTION OF INTRAPERITONEAL MACROPHAGES IN MICE

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BACKGROUND AND OBJECTIVES

In recent years, lifestyle-related diseases such as obesity, diabetes, and dyslipidemia have been recognized as problems, one of the causes of which is an excessive fatty diet. Obesity and other related diseases are known to be risk factors for the severity of infectious diseases such as sepsis and novel coronavirus infection, but their pathomechanisms have not been clarified. Therefore, we hypothesized that a diet high in fat might induce functional changes not only in adipocytes but also in macrophages, weakening the immune response and leading to aggravation of infectious diseases. Therefore, in this study, lipidomics, proteomics and RNA sequencing analyses were used to determine whether the fat composition of macrophages is altered by a high-fat diet load and what gene and protein expression is induced in macrophages by a high-fat diet load.

METHODS

Four-week-old mice were divided into normal diet (ND) and high-fat diet (HFD) groups and kept for four weeks. Macrophages were collected intraperitoneally from mice injected intraperitoneally with 2 mL of thioglycolic acid medium to promote macrophage proliferation one week before necropsy and cultured in Roswell Park Memorial Institute medium (RPMI) at 37°C in a 5% CO2 environment. After 2 hours of incubation in this environment, the floating cells were removed and the recovered macrophages were used for lipidomics, proteomics. In addition, RNA extracted from the macrophages was used for RNA sequencing analysis.

RESULTS

Lipidomics showed a marked increase in the proportion of TG (18:0_18:0_18:0) constituting oleic acid in macrophages in the high-fat diet. Proteomics identified more than 4000 proteins in each group. In the HFD group, compared to the ND group, decreased expression of proteins involved in phagocytosis, such as immunoglobulin and eosinophil peroxidase, was observed. In addition, RNA sequencing data analysis also showed a decrease in the expression levels of genes related to phagocytosis, which had been observed to decrease in proteomics.

CONCLUSIONS

From the above, the RESULTS show that a high-fat diet load not only alters the lipid composition within macrophages, but also alters gene and protein expression involved in various lipid metabolism and immune regulation. It was suggested that these changes in macrophage function may contribute to the development of infectious diseases and various disorders.

CONFLICTS OF INTERESTS

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EPO8_041

ADDITION OF EVOSORPTION ON WHEY PROTEIN PRODUCT INCREASE THE POST-PRANDIAL SERUM AMINO ACID

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BACKGROUND AND OBJECTIVES

A high-protein diet is needed for lean tissue-building. Some whey protein (WP) products suggest a high serving size of 50 g for WP. However, the amount of digested and absorbed WP may be limited due to a lack of endogenous digestive enzymes. The objective of this study was to evaluate the impact of Commercial Whey Protein (CWP) and Solid Food (SF) consumption compared to Evolene Whey Protein with the addition of Evosorption (EWPE) on postprandial amino acid levels, CRP, and nitrogen balance. Evosorption is a protease enzyme that contains 100,000 Units/g papain and 140 GDU/g bromelain.

METHODS

A single-blinded study was performed on healthy male subjects under fasting conditions. The study was carried out after approved by the Medical and Health Research Ethics Committee (MHREC), Universitas Gadjah Mada, Indonesia. The study involved nine healthy lean male subjects (age 20-36 years, BMI 20-24.9 kg/m2, and a normal CRP level <0.3 mg/L). All subjects were divided into three groups: EWPE, CWP, and SF from beef tenderloin. Each intervention product contains 50 grams of protein. Differences in protein absorption rate were determined by measuring serum postprandial amino acid levels. Urea levels in urine samples were used to determine total nitrogen. CRP levels were also measured.

RESULTS

The RESULTS showed that the %bioavailability of EWPE compared to SF shows significant differences ($p<0.05$) in each IAA. The EWPE group has a higher %bioavailability than the SF group, with the percentage increase varying among amino acids, ranging from 15% to 119%. The highest increase occurred in the amino acids threonine + glycine. The postprandial Branched Chain Amino Acids (BCAA) levels in the EWPE demonstrated a higher trend compared to the CWP and SF ($p<0.05$). The total AUC of all fourteen amino acids is considered the amino acid bioavailability of the EWPE, CWP, and the SF groups. The total TSAA AUC of the EWPE group was 22.4% higher than the CWP group ($p<0.05$). When compared to the SF group, the TSAA AUC of EWPE was 50.6% higher ($p<0.05$). The C-Reactive Protein (CRP) levels of EWPE group was not significantly different from the CWP and SF group ($p>0.05$), indicating that EWPE does not induce inflammation. The urinary nitrogen levels in the EWPE did not significantly differ compared to the CWP and SF ($p>0.05$).

CONCLUSIONS

The addition of Evosorption, a mixture of papain and bromelain, increased the bioavailability of WP. The EWPE has a higher bioavailability compared to CWP and SF from beef tenderloin, hence Evosorption can be added to WP to increase the digestion and absorption of WP.

CONFLICTS OF INTERESTS

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EPO8_042

LYSINE DEFICIENCY REDUCES HIPPOCAMPAL NEUROGENESIS AND IMPAIRS COGNITIVE-LIKE BEHAVIOR IN RATS

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BACKGROUND AND OBJECTIVES
Increased consumption of cereal-based diets is known to reduce lysine availability. Previously, we demonstrated that lysine deficiency induced anxiety-like behavior in rats (1). However, its impact on hippocampal neurogenesis remains unclear. This study aimed to investigate the effects of lysine deficiency on hippocampal neurogenesis and its potential relationship with cognitive-like behavior in rats.

METHODS
Adult male Sprague-Dawley rats were randomized into three groups (n=8/group) and maintained on their respective diets for four weeks: a control group (adequate lysine) and two lysine-deficient groups (30% and 60% lysine-deficient diets). Neuro-proliferation and neuro-differentiation, early and late stages of neurogenesis, respectively, were assessed using Bromodeoxyuridine (BrdU) intraperitoneal injections. For proliferation, BrdU was administered 24 hours before euthanasia, while for neurogenesis, it was administered one month prior. Behavioral changes were evaluated biweekly using the Open Field Test (OFT) for spontaneous locomotion, Novel Object Recognition (NOR) for recognition memory, Y-maze for spatial memory, and Elevated Plus Maze (EPM) for anxiety-like behavior. Molecular analyses were performed post-experiment to evaluate neurogenesis activity, neurotrophic factor levels, and neurotransmitter receptor expression.

RESULTS
Behavioral assessments revealed that lysine deficiency significantly impaired spatial memory, novel object recognition, and exploratory behaviors, alongside increased anxiety-like behaviors. Both moderate and severe lysine-deficient diets significantly decreased neural stem cell proliferation and neurogenesis in the hippocampus. Molecular analysis showed reduced mRNA expression of neurotrophic factors and altered expression of neurotransmitter receptors in lysine-deficient rats

CONCLUSIONS
Moderate and severe lysine deficiency impaired hippocampal neurogenesis and cognitive-like behaviors in rats. These findings suggest that lysine deficiency may contribute to brain dysfunctions, with potential clinical implications for populations relying heavily on lysine-poor cereal diets.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_043

IMPACT OF OBESITY ON DNA METHYLATION OF VITAMIN D PATHWAY GENES CYP2R1 AND VDR: A PILOT STUDY IN NORTHERN IRELAND

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BACKGROUND AND OBJECTIVES
Background: Obesity is growing as a worldwide health epidemic, impacting a significant percentage of the population and resulting in millions of deaths each year. The rise in obesity rates is associated with perturbations within key metabolic pathways, influenced by both hereditary and epigenetic factors. This pilot study examines the correlation between obesity and DNA methylation patterns within genes pivotal to vitamin D status and response: CYP2R1 and VDR. **Objective:** The present study was undertaken to determine if body mass index (BMI) can serve a predictor for the regulation of these genes via changes in methylation, which could potentially impact vitamin D metabolism and inflammation.

METHODS
We examine DNA methylation by pyrosequencing at several CpG sites within the promoter and proximal enhancer regions of CYP2R1 and VDR genes using secondary blood samples from the MOVIT-D cohort (Maternal Obesity and baseline vitamin D insufficiency change the response to vitamin D supplementation: a double-blind, randomised trial in pregnant women), previously detailed by Alhomaid et al., 2021. From this cohort we selected consists of 65 women at 12th week of pregnancy; 34 having a normal BMI and 31 defined as obese.

RESULTS
Our research uncovered a correlation between obesity and increased levels of DNA methylation at locations within the VDR gene on chromosome 12, although the overall levels of methylation were low. We observed significant association between BMI and methylation at a cluster and two specific locations in the VDR gene. In addition, there is a correlation between higher methylation at a specific VDR site (Hg38-Chr12-47905640) and increased levels of TNF-α measured within cohort subjects.

CONCLUSIONS
The RESULTS suggest that alterations in the VDR gene due to BMI-related epigenetic modifications may contribute to inflammation and mediation of the vitamin D response. This sheds potential light on the molecular processes that link obesity, vitamin D insufficiency, and potential health consequences.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_044

AMELIORATING EFFECTS OF VITAMIN K2 ON DEXTRAN SULFATE SODIUM-INDUCED ULCERATIVE COLITIS IN MICE

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BACKGROUND AND OBJECTIVES

Ulcerative colitis (UC) is a non-specific chronic inflammation of the gut, the pathogenesis of which is still unclear. Currently, there is no specific treatment for UC. Vitamin K (VK) deficiency is widespread in people with inflammatory bowel disease. Vitamin K (including Vitamin K1 and Vitamin K2) is a fat-soluble vitamin that helps to maintain the body's metabolism and health. Vitamin K2 (VK2) has higher biological activity than vitamin K1 (VK1). The roles of VK2 in inhibiting inflammation, oxidative stress, and suppressing immune response have been reported. The purpose of this study was to explore the alleviating effect of vitamin K2 (VK2) on UC, as well as its mechanism.

METHODS

C57BL/6J mice were given 3% DSS for seven days to establish UC, and they then received VK2 (15, 30, or 60 mg/kg·bw) and 5-aminosalicylic acid (100 mg/kg·bw) for two weeks. The clinical signs, body weights, colon lengths, and histological changes were recorded during the experiment. The serum MK-4/7, oxidative stress indexes, and inflammatory cytokines were analyzed. The expression of NF-κB pathway-related proteins and tight junction proteins was measured using western blot. The gut microbiota and short-chain fatty acids (SCFAs) were measured by 16S rRNA and targeted metabolomics.

RESULTS

According to the RESULTS, VK2 restored the colon lengths, improved the colonic histopathology, reduced the levels of proinflammatory cytokines (such as IL-1β, TNF-α, and IL-6), and boosted the level of the immunosuppressive cytokine IL-10 in the colon tissues of the colitis mice. Moreover, VK2 promoted the expression of mucin and tight junction proteins and significantly ameliorated the changes in NF-κB pathway-related proteins caused by DSS induction. Additionally, VK2 intervention had a significant ameliorative effect on intestinal flora alteration and increased the relative abundance of SCFA-producing bacteria, such as Eubacterium_ruminantium_group and Faecalibaculum.

CONCLUSIONS

In conclusion, VK2 alleviated the DSS-induced colitis in the mice, perhaps by boosting the dominant intestinal microflora, such as Faecalibaculum, by reducing intestinal microflora dysbiosis, and by modulating the expression of SCFAs, inflammatory factors, and intestinal barrier proteins.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_045

INDIVIDUAL BRANCHED-CHAIN AMINO ACIDS DEFICIENCIES EXHIBIT DISTINCT EFFECT ON HEMATOLOGICAL PARAMETERS IN RATS

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BACKGROUND AND OBJECTIVES
Anemia, defined by low hemoglobin (Hb) levels, is a significant public health issue, particularly in low- and middle-income countries (LMICs), where diets are often of low protein quality and quantity. Recent findings showed a strong positive association between plasma levels of branched-chain amino acids (BCAAs); leucine (Leu), isoleucine (Ile), and valine (Val); and Hb [1]. However, the causal mechanism behind this observed correlation remains unclear. Notably, globin, the protein component of Hb, contains around 15% Leu and 10.6% Val, while ile is present in negligible amounts [2]. Accordingly, we aim to examine the effect of individual dietary BCAAs deficiency on hematological parameters in young male rats fed a low-protein diet.

METHODS
Four-week-old male Sprague Dawley rats were randomly divided into four groups based on their representative diets and monitored for six weeks (n=8/group). We utilized four different diets: an AA-defined low-protein diet (∼10 % of calories from protein, Low P) and three AA-defined low-individual BCAA diets (Low Leu, Low Val, Low Ile), in which the levels of leucine, valine, or isoleucine were reduced by 50% while maintaining ∼10% of calories from protein. At the end of the experiment, blood samples were collected from the superior vena cava for complete blood count (CBC) analysis.

RESULTS
The RESULTS showed no significant differences in Hb levels (p = 0.387) across the different dietary conditions. Despite no statistically significant difference (p=0.079), the lowest red blood cell (RBC) count was observed in the low-Val group (7.22 ± 0.40 million/cu.mm), indicating a trend towards reduced RBC levels compared to the other groups. Mean corpuscular volume (MCV) and mean corpuscular hemoglobin (MCH) were significantly higher in the individual BCAA deficiency groups, except for low-Leu, compared to the low-P group (p = 0.034 and p = 0.005, respectively). Furthermore, red cell distribution width (RDW) was markedly elevated in the low-Ile group (16.18 ± 0.56%) compared to all other groups (p = 0.026).

CONCLUSIONS
These data suggest that under a low-protein diet, individual BCAAs have distinct effects on hematological parameters. Further analysis is needed to clarify the exact causal mechanisms of these findings.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_046

ANTI-OBESITY EFFECTS OF ACYLATED STERYL-B-GLYCOSIDES IN HIGH-FAT/HIGH-SUCROSE DIET-INDUCED OBESE MICE

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BACKGROUND AND OBJECTIVES
Phytosterols, which are abundant in soybeans, corn, rice bran, sesame seeds, etc., are a general term for the main sterols such as cholesterol and phytosterols, and their plant-derived components. Plant sterols are those with a different C-3 position in the steroid skeleton, and exist in the form of free sterols with a free hydroxyl group, sterol esters with an ester bond to a fatty acid, sterol glycosides, and acylated steryl β-glucosides (ASG) with an acyl group bonded to a sugar.
On the other hand, there have been few reports on the mechanisms by which plant sterols affect the accumulation of triglycerides in the body. Even in recent reviews of the functional characteristics of plant sterols, it has been shown that the mechanisms of action have not yet been fully elucidated. Therefore, the aim of this study was to investigate the effects of ASG, a highly purified plant sterol derivative, on lipid metabolism, including body fat and dyslipidemia, in obese mice fed a high-fat, high-sucrose diet (HFHSD).

METHODS
To investigate the mechanism of action of ASG on lipid metabolism, we compared the amount of body fat accumulation, plasma lipids, and gene expression in the liver of high-fat, high-sucrose diet-fed obese model mice and high-fat, high-sucrose diet-fed obese model mice that had been administered high-purity ASG for 55 days.

RESULTS
In the analysis of the mechanism, the lipid intake and the lipid excretion rate in the feces were the same in the HFHSD group and the ASG group, but the weight gain on day 55 of the ASG group was significantly lower (0.5% ASG: $P < 0.05$, 1.0% ASG: $P < 0.01$). Furthermore, plasma insulin, leptin and lipid concentrations were reduced, and adiponectin concentrations were increased in the ASG group. In addition, gene expression of adrenergic receptor β3 (ADRβ3), peroxisome proliferator-activated receptor α (PPARα), β-oxidation enzymes and uncoupling protein 3 (UCP3) was increased in the liver, and gene expression of fatty acid synthase (FAS) was decreased. Conversely, the amount of free fatty acids in the liver showed a significant positive correlation with the level of triglycerides, the weight of various adipose tissues, and FAS gene expression, but not with the intensity of β-oxidation-related gene expression.

CONCLUSIONS
These RESULTS suggest that ASG may reduce the accumulation of body fat by improving the secretion of adiponectin and increasing the β-oxidation of fatty acids in the liver, and suggest a possible anti-obesity mechanism of ASG.

CONFLICTS OF INTERESTS
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EPO8_047

DIRECT ANALYSIS OF ESTERIFIED DOCOSAHEXAENOIC ACID HYDROPEROXIDE ISOMERS IN BIOLOGICAL SYSTEMS WITH LIQUID CHROMATOGRAPHY-TANDEM MASS SPECTROMETRY

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BACKGROUND AND OBJECTIVES

Docosahexaenoic acid (DHA), predominantly present in the brain, is crucial for brain function and health. Its high degree of unsaturation makes it highly susceptible to oxidation. In biological systems, lipids are oxidized either via non-enzymatic or enzymatic processes, producing different oxidation products (e.g., hydroperoxide). Oxidized lipid derivatives from the non-enzymatic process generally promote inflammation. In contrast, recent studies have identified numerous enzymatic oxidation products that function as lipid mediators, regulating inflammation in the body. Given the diverse implications and functionalities of oxidized lipids, understanding DHA oxidation pathways is essential for exploring the mechanisms behind DHA's physiological functions. To date, analytical challenges persist in directly analyzing DHA oxidation products in esterified forms, the major lipid pools in the brain. This study aimed to develop a liquid chromatography-mass spectrometry (LC-MS/MS) method for esterified DHA hydroperoxide (DHA;OOH) in biological systems.

METHODS

PC 16:0/22:6 was chosen as the target based on lipid composition in the whole brain (Igarashi *et al*, 2012). The target PC was prepared through esterification of DHA to 1-palmitoyl-lysophosphatidylcholine and subjected to photo-oxidation to obtain a hydroperoxide isomeric mixture. The multiple reaction monitoring conditions were optimized for each isomer with the prepared isomeric mixture. Optimized LC-MS/MS methods were applied to the phospholipid extract of the whole brain from a Sprague Dawley rat.

RESULTS

The product ion scan of sodium adduct of PC 16:0/22:6;OOH revealed products generated through the fragmentation near the OOH group, thereby allowing determination of OOH group position, as previously observed with free DHA;OOH (Kato *et al*, 2021). The LC-MS/MS chromatogram of the phospholipid fraction of the rat whole brain exhibited several isomer peaks, which included those generated via enzymatic and/or non-enzymatic processes (Derogis *et al*, 2013). Further refinement of the lipid extraction method is currently underway to enhance the sensitivity of the LC-MS/MS method.

CONCLUSIONS

The constructed LC-MS/MS method demonstrated potential applicability in exploring DHA oxidation processes in biological systems, possibly providing a closer understanding of DHA oxidation in the body.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_048

EVALUATION OF AN ALTERNATIVE DIRECT AMINO ACID OXIDATION METHOD TO ESTIMATE THE TOLERABLE UPPER INTAKE LEVEL OF PROTEIN IN RATS

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BACKGROUND AND OBJECTIVES
The use of protein supplements has become popular recently, but research is required on the health effects of excessive protein intake. The tolerable upper intake level of protein has not been established by the WHO/FAO/UNU (2007). The conventional method to measure the protein metabolism uses changes in expiratory 13CO2 levels after the oral administration of 13C-labelled amino acid. The present study was conducted to evaluate the tolerable upper intake level of protein in rats employing a direct amino acid oxidation (DAAO) technique using l-[1-13C]phenylalanine.

METHODS
Male rats (7-weeks old) were housed under controlled lighting conditions and fasted overnight. On the study day, in random order without repeats, eight rats received one of 4 levels of the casein diet (40, 50, 60, 70%), which contained 10% l-[1-13C]phenylalanine of the phenylalanine. The diet was consumed beginning at 09:00 and continued at 1-hour intervals until 18:00 for a total of 10 meals. Each meal accounted for 1/12 of the rats' total daily intake. Breath samples were collected, and the 13CO2 level in the breath was measured at 1-hour intervals from 09:00 to 19:00.

RESULTS
In all rats fed the 40~70% casein diets containing l-[1-13C]phenylalanine, the exhaled 13CO2 concentrations increased gradually until 16:00 and remained constant until 19:00. Although the 13CO2 in rats fed 40, 50 or 60% casein diets increased according to the increased protein intakes, the 13CO2 in the rats fed the 70% casein diet were similar to those of rats fed the 60% casein diet. As the protein intake increased, blood and urinary urea nitrogen increased steadily.

CONCLUSIONS
The RESULTS showed that the tolerable upper intake level of protein in rats was about a 60~70% casein diet, suggesting that the tolerable upper intake level of protein could be estimated using the alternative DAAO method.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_049

THE NUTRIENT CONTENT, ANTIOXIDANT ACTIVITY, AND ORGANOLEPTIC PROPERTIES OF GELATO WITH THE ADDITION ON RED CABBAGE (BRASSICA OLERACEA L.) POWDER

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BACKGROUND AND OBJECTIVES
Recently, gelato become a very popular dessert in Indonesia. To improve the nutrient content and bioactive compounds in gelato, red cabbage (*Brassica oleracea* L.) powder is added. The objectives of this study were to evaluate the nutrient and anthocyanin content, antioxidant activity as well as organoleptic properties of gelato with the addition of red cabbage powder.

METHODS
As many as four levels of red cabbage addition namely 0%, 2%, 4%, and 6% was performed. The red cabbage powder was prepared with slicing 5-7 cm of red cabbage, the dried with food dehydrator at 55 oC for 20 hours, grinded and sieved with 80-mesh sieves. The gelato was made from UHT full cream milk, added with egg yolk, sugar powder, and guar gum as stabilizer. The mixture was then pasteurized at 80-85 oC for 30 seconds, cooled until 55 oC, added with red cabbage, cooled at 4 oC for 24 hours, agitated with ice cream maker for 25-30 minutes, kept at -14 until -18 oC until analysis. The moisture, ash, protein, fat, and crude fiber content was determined using AOAC method. The carbohydrate content was determined by difference. The anthocyanin content was determined with spectrophotometry method, while antioxidants activity was determined with DPPH (2,2-di(4-ert-octylphenyl)-1-picrylhydrazyl) colorimetry method. The organoleptic properties namely of colour, aroma, taste, and overall was determined using hedonic test.

RESULTS
The RESULTS showed that adding red cabbage powder to the gelato resulted in differences in moisture, ash, fat, crude fiber, anthocyanin content, and antioxidant activity, whereas the protein and carbohydrate content did not significantly differ. The hedonic test showed that the addition of red cabbage powder had a significant difference in the level of preference for organoleptic properties in color, aroma, taste, and overall parameters. The selected gelato product had good acceptability because 97% of panelists consumed the product more than 75% of serving size.

CONCLUSIONS
The addition of red cabbage to gelato affects the nutrient and anthocyanin content as well as antioxidant activity. Furthermore, it has good acceptability, so it can be consumed as a functional food rich in antioxidants.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_050

QUANTITATIVE ANALYSIS OF SPHINGOLIPIDS IN FOOD INGREDIENTS FOR ESTIMATION OF AVERAGE INDIVIDUAL INTAKE

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BACKGROUND AND OBJECTIVES

Sphingolipids are a family of compounds that have a sphingoid base (long-chain base) with an amide-linked fatty acid and a polar head group, such as phosphorylcholine (for sphingomyelin) or carbohydrate (for cerebrosides, gangliosides, and other complex glycolipids), and are ubiquitous in a variety of food ingredients. Recent emerging evidence has implicated dietary sphingolipids in human health. On the other hand, highly polar sphingolipids (GIPCs) with complex sugar chain are present in higher plants, but are difficult to quantify and are not well known as food components. In this study, we attempted a comprehensive quantification of sphingolipids in foods by quantitative compositional analysis of the constituent sphingoid bases.

METHODS

Food materials derived from agricultural, livestock, and marine products were used as samples. The lyophilized samples were acid hydrolyzed directly, or fractionated into Folch's upper layer (including intermediate layer) and lower layer, and then acid hydrolyzed. The resulting sphingoid bases were fluorescently derivatized by an ortho-phthalaldehyde reagent and then quantitatively analyzed by HPLC with a fluorescence detector.

RESULTS

Based on the quantitative values obtained in this study, the sphingolipid contents in food ingredients were estimated. Compared to animal and fishery products, a considerable amount of highly polar sphingolipids was contained in agricultural products (10-85% of total sphingolipids), with trihydroxy types as the major sphingoid bases. Based on our RESULTS, it was newly estimated that each Japanese person consumes approximately 100 mg of highly polar sphingolipids per day, in addition to approximately 90 mg of general fat-soluble sphingolipids such as glucosylceramide and sphingomyelin.

CONCLUSIONS

In this study, quantitative analysis of sphingoid bases as degradation products of sphingolipids indicated that highly polar sphingolipids are daily consumed almost as much or more than regular simple fat-soluble sphingolipids.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_051

UROLITHIN A IMPROVES VASCULAR ENDOTHELIAL FUNCTION BY INHIBITING ENDOTHELIN-1 PRODUCTION AND INCREASING ANTIOXIDANT ENZYME EXPRESSION

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BACKGROUND AND OBJECTIVES
Urolithins are microbiota-derived metabolites produced from ellagic acid present in certain foods, such as pomegranates, berries, and walnuts. We recently reported that Urolithin A (UA) intake tended to improve flow-mediated vasodilatation (FMD) score in non-UA producers. In this study, we investigated the effects of UA on vascular endothelial function, focusing on the anti-inflammatory and antioxidant mechanism.

METHODS
Human umbilical vein endothelial cells (HUVECs) were pre-treated with UA (~10 μM) for 24 h and then stimulated with TNF-α. The mRNA and protein analysis were performed by real time PCR and western blotting, respectively. Cell viability was evaluated by MTT assay.

RESULTS
UA significantly suppressed endothelin-1 (ET-1) mRNA expression and secreted protein levels, which were increased by TNF-α. UA also suppressed the mRNA expression of endothelin converting enzyme 1 (ECE1). Increased expressions of mRNA of inflammatory cytokines/chemokines (IL-6, IL-8 and MCP-1) by TNF-α were significantly suppressed by UA. Furthermore, UA significantly increased the mRNA expression of antioxidant enzymes, such as heme oxygenase 1 (HO-1), NAD(P)H quinone dehydrogenase 1 (NQO-1), and glutamate-cysteine ligase modifier subunit (GCLM). We found that UA stimulated Nrf2 translocation to the nucleus. In addition, pretreatment with UA significantly suppressed the decrease in cell viability caused by hydrogen peroxide.

CONCLUSIONS
These data suggest that UA inhibits the production of endothelin-1 and induces the expression of antioxidant enzymes, which may exert a protective effect against oxidative stress injury and contribute to improved vascular endothelial function.

CONFLICTS OF INTERESTS
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EPO8_052

GALACTO-OLIGOSACCHARIDES AMELIORATES THE DYSBIOSIS OF GUT MICROBIOTA AND ENHANCES RENAL URATE EXCRETION TO ALLEVIATE HYPERURICEMIA

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BACKGROUND AND OBJECTIVES
Hyperuricemia (HUA) has become the second most common metabolic disease globally. In addition to gout, HUA has also been linked to the development of inflammatory arthritis, renal and cardiovascular diseases, posing a major threat to all societies. Recently, a growing body of evidence suggests that dysbiosis of gut microbiota plays an important role in the pathogenesis of HUA. Galacto-oligosaccharides (GOS) is a non-digestible carbohydrate, which has extensively demonstrated beneficial impact on intestinal health. However, its role in HUA remains unclear.

METHODS
Eight-week male mice on C57BL/6J background were fed with diet supplemented with 2% uric acid and 4% oxonic acid to induce HUA. 16s RNA sequencing was employed to examine the alterations of gut microbiota and mouse adeno-associated virus 9 delivery system was used to renal targeted knock down ABCG2 *in vivo*.

RESULTS
Gavage of GOS enhanced renal urate excretion by 75%, leading to 50% reduction in serum uric acid. Though no obvious difference in microbial diversity was observed, GOS treatment resulted in a notable increase in *Bacteroidia* but a remarkable reduction in *Gannaproteobacteria*. Moreover, mice receiving fecal microbial transplantation from donors fed with GOS demonstrated a 1.5-fold increase in fractional excretion of urate. Consistently, recombinant ATP binding cassette transporter G2 (ABCG2) in the kidney, a major transporter for urate, was found to be 1.8-fold higher at both transcriptional and protein levels in mice treated with GOS. Similarly, PDZ domain-containing 1 (PDZK1), a scaffold protein that bound to ABCG2 and mediated its subcellular localization was found to be 1.0-fold higher after GOS gavage. Notably, kidney-specific inhibition of ABCG2 largely abolished the uric acid-lowering effect of GOS. Mechanistically, GOS treatment suppressed the translocation of NF-κB to nucleus and led to a 30% reduction in the excretion of pro-inflammatory IL-1β, which in turn boosted kidney urate secretion.

CONCLUSIONS
Our findings indicated that GOS promoted kidney urate excretion and offered an alternative strategy for the prevention and treatment of HUA.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_053

DELAYING THE ONSET OF DIABETES-RELATED SYMPTOMS BY 1,5-ANHYDRO-D-GLUCITOL THROUGH DISACCHARIDASE INHIBITION IN KKAY MICE

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BACKGROUND AND OBJECTIVES
1,5-Anhydro-D-glucitol (1,5-AG) is a hexose polyol that is made from 1,5-anhydro-D-fructose (1,5-AF). Monosaccharides such as D-sorbose and L-arabinose strongly inhibit the activity of sucrase and maltase in the small intestine. Therefore, 1,5-AG also may be a candidate related for inhibition of disaccharidases. We investigated the inhibition to disaccharidases in rat intestine, and the delaying effect of feeding of 1,5-AG on the onset of diabetes through the antioxidant effect.

METHODS
Synthetic 1,5-AG (purity > 99 %) was provided by SUNUS Co., Ltd. (formerly Nihondenpun Kogyo, Co., Ltd., Kagoshima, Japan). The analysis of the hydrolyzing activity on disaccharides from rats was carried out following Oku's method using glucose oxidase. KKAy mice raised with AIN93G (control), 3% or 6% 1,5-AG and 6% erythritol (ERT, positive control) diet for 7 weeks.

RESULTS
1,5-AG inhibited about 50 % of sucrase and 30 % of maltase activity in rat small intestine. 1,5-AG strongly inhibited trehalase and lactase. Urinary glucose excretion in 6% 1,5-AG at 4, 6 weeks and that in 6% ERT at 4, 6, 7 weeks were significantly lower than that in control, respectively ($p<0.05$). After 7 weeks 8-hydroxy-2'-deoxyguanosine in urine, fasting plasma glucose, insulin, total cholesterol and triacylglycerol in 6% 1,5-AG were significantly lower than those in control ($p<0.05$), respectively.

CONCLUSIONS
These RESULTS demonstrate that the 1,5-AG may be useful a food ingredient which has antidiabetic effect. However, more research is required in terms of its mechanism of action in relation to its delaying effect on the onset of diabetes and antioxidant properties.

CONFLICTS OF INTERESTS
Kazuhiro Yoshinaga

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EPO8_054

EFFECTS OF VITAMIN C DEFICIENCY AND REFEEDING ON ANXIETY-LIKE BEHAVIOR AND NEUROINFLAMMATION IN ODS RATS

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BACKGROUND AND OBJECTIVES
Vitamin C (VC) deficiency may increase anxiety-like behavior via oxidative stress in the brain. This study investigated the relationship between VC deficiency, anxiety-like behavior, and neuroinflammation, as well as the effects of VC refeeding, using ODS (ODS/ShiJcl od/od) rats, which lack the ability to synthesize VC.

METHODS
Five-week-old male ODS rats were fed either a VC-sufficient diet (0.3 g/100 g) or a VC-deficient diet. Half were used for anxiety behavior analysis and then dissected (C+ group, C- group). The remaining rats were provided with VC-supplemented water (2 g/L), maintained, and analyzed after behavior tests (C+/+ group, C-/+ group). Experiment 1 involved 17 days of VC deficiency followed by 9 days of supplementation, while Experiment 2 included 26 days of deficiency followed by 14 days of supplementation. Anxiety behavior was assessed using elevated plus maze (EPM) and open field (OF) tests. VC deficiency levels were evaluated through VC concentrations in tissues and plasma and hepatic Cytokine-induced neutrophil chemoattractant-1 (CINC-1) mRNA levels. Neuroinflammation and neuronal effects were assessed using hippocampal Interleukin-6 (IL-6) and Brain-derived neurotrophic factor (BDNF) mRNA levels.

RESULTS
In Experiment 1, OF tests showed significantly increased anxiety-like behavior in the C- group compared to the C+ group, restored to C+/+ levels in the C-/+ group. CINC-1 and IL-6 mRNA levels increased, while tissue and blood VC concentrations decreased in the C- group, all recovering to C+/+ levels in the C-/+ group.In Experiment 2, prolonged VC deficiency caused motor activity loss in EPM and OF tests in the C- group. Anxiety-like behavior in the C-/+ group remained higher than in the C+/+ group. CINC-1 and IL-6 mRNA increased, while tissue and plasma VC concentrations and BDNF mRNA decreased in the C- group, all recovering in the C-/+ group.

CONCLUSIONS
VC deficiency-induced anxiety-like behavior, reduced motor activity, and neuroinflammation were restored by VC refeeding. Severe VC deficiency increased neuroinflammation and reduced BDNF expression, both reversible with VC reintroduction. However, anxiety-like behavior caused by severe VC deficiency did not fully recover, even after refeeding.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_055

METABOLISM OF SINENSETIN, A CITRUS PEEL COMPONENT, BY RAT AND GUINEA PIG LIVER MICROSOMES

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BACKGROUND AND OBJECTIVES

Sinensetin (SNT) is a type of polymethoxyflavones (PMFs) distributed in citrus peel, and has attracted attention because it exhibits anti-cancer, anti-dementia and anti-inflammatory effects.1) It is important to clarify whether these effects currently are due to the parent compound or a metabolite. Recently, it has been reported that 5-demethylated (5-OH) PMFs derived from citrus peels have anti-cancer effects stronger than their parent compounds.2) Therefore, the metabolism of SNT was investigated using rat and guinea pig liver microsomes (Ms) and the effects of typical cytochrome P450 (CYP) inducers, phenobarbital (PB), 3-methylcholanthrene (MC) and dexamethazone (DEX) were also examined.

METHODS

Metabolic activity: SNT was incubated for 20 min at 37°C with animal liver Ms, NADPH-generating system, MgCl2, HEPES buffer (pH 7.4) under aerobic condition. Rat and guinea pig liver Ms were prepared from untreated (Con), PB-, MC- and DEX-treated animals. After incubation, an ice-cold methanol was added to stop the reaction and the incubation mixture was centrifuged to remove the denatured protein. The supernatants obtained were applied to reverse phase HPLC and LC-MS for analyses of the metabolites. Synthesis of metabolites: Three mono-demethylated SNT, 5-, 3'- and 4'-OH-SNT, were synthesized. 6-OH-SNT was estimated to be the other mono-demethylated form.

RESULTS

In rats: Con-Ms oxidized SNT to give six metabolites. Among them, M4, M3 and BM2 were major metabolites. LC-MS showed that M3 was a 1:1 mixture of 4'- and 3'-OH-SNT, and that BM2 was consistent with 5-OH-SNT. Also, M4 was presumed to be 6-OH-SNT. The product activities of 6-, 3'-, 4'- and 5-OH-SNT were 1.0, 0.4, 0.3 and 0.2 nmol/min/mg protein, respectively. PB-Ms increased 6-, 3'- and 5-OH-SNT 1.4- to 3-fold of Con-Ms. MC-Ms increased 3'- and 4'-OH-SNT 4-fold of Con-Ms. DEX-Ms also increased 6- and 5-OH-SNT 2-fold of Con-Ms. In guinea pigs: Con-Ms mainly produced 4'- and 6-OH-SNT at a rate of 1.0 and 0.6 nmol/min/mg protein, respectively. PB-Ms increased 6- and 5-OH-SNT, and MC-Ms significantly increased 4'-OH-SNT compared to Con-Ms. In contrast, DEX-Ms reduced 4'-OH-SNT to 58% of Con-Ms.

CONCLUSIONS

These RESULTS suggest that SNT metabolism Ms proceeds mainly via oxidative demethylation in rat and guinea pig liver, that DEX-inducible CYP3A and MC-inducible CYP1A enzymes were involved in the demethylation of A ring and B ring, respectively, and that PB-inducible CYP2B enzymes were involved in the demethylation of both A and B ring.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_056

LIVER-SPLEEN AXIS IN GAN DIET-INDUCED MASH MODEL MICE

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BACKGROUND AND OBJECTIVES

Nicotinamide adenine dinucleotide (NAD) is a redox coenzyme that is ubiquitously present in living organisms. In recent years, metabolic dysfunction associated steatohepatitis (MASH) induced by obesity has become a global problem, especially in developed countries. Against this background, a “Liver-Spleen axis" of MASH has been propounded, in which MASH affects not only the liver but also the splenic tissue in a linked manner, although the details of this linkage are often unclear.
We have previously found that gene expression related to NAD metabolism was reduced across the board in the liver of MASH model mice fed a Gubra Amylin NASH (GAN) diet for 14, 26, and 55 weeks. However, the effect of GAN diet intake on liver-spleen interaction remains unknown. In this study, we used obese MASH model mice to investigate the effect of diet intake on NAD metabolism in the liver and spleen.

METHODS

Seven-week-old male C57BL/6J mice were fed a GAN diet (high fat, high cholesterol, high fructose) for the GAN group and a control diet (10 kcal% fat) for the control group for 14, 26, and 55 weeks, respectively. Using the liver and spleen tissues obtained from these animals, the gene expression levels of each enzyme of NAD metabolism and inflammation/fibrosis-related factors were analyzed by quantitative PCR.

RESULTS

The RESULTS of measuring and comparing NAD metabolic enzyme gene expression levels in the liver using quantitative PCR showed that the expression levels of almost all NAD metabolic enzyme genes were lower in the groups that had been fed GAN feed for 14, 26, and 55 weeks compared to the control group. On the other hand, in the spleen, it was shown that the expression of most NAD metabolic enzyme genes was either lowered or unchanged. Interestingly, gene expression of IL-1b, TNF-a and MCP-1 was predominantly increased in the liver, whereas it was decreased in the spleen in the group fed the GAN diet for 26 weeks.

CONCLUSIONS

These findings suggest that NAD metabolism in obesity-induced MASH may be lower across the board in the liver, but lower or unchanged in the spleen. As for inflammation-related factors, the RESULTS suggest that there may be a relative relationship between gene expression variation in liver-derived and spleen-derived factors.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_057

VITAMIN D DEFICIENCY INDUCES COGNITIVE IMPAIRMENT BY REGULATING SUMOYLATION MODIFICATION OF CYP27A1

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BACKGROUND AND OBJECTIVES
Our previous study has found that vitamin D (VD) deficiency plays an important role in the pathological progression of mild cognitive impairment (MCI). 27-hydroxycholesterol (27-OHC), one of the most abundant cholesterol-oxidized metabolites, is also a widely recognized risk factor for MCI. 27-OHC is synthesized by CYP27A1, which is a crucial enzyme in both oxysterols and VD metabolism. This study aims to explore whether VD deficiency induce cognitive decline by regulating CYP27A1 and its possible mechanism.

METHODS
Here, male C57BL/6J mice were fed a VD-deficient diet for 13 weeks to establish the VD-deficient (VDD) mice model. CYP27A1-short-hairpin RNA (CYP27A1-shRNA) and 2-D08 were used to inhibit the CYP27A1 expression and SUMOylation, respectively. Then, the neurobehavioral performance and brain pathological changes were evaluated. The gene and protein expression levels of SUMOylation related factors (SUMO1, Ubc9) in the brain were determined by qRT-PCR and western blot. The interaction between CYP27A1 and SUMO1 protein was assessed with Co-immunoprecipitation (Co-IP) and immunofluorescence.

RESULTS
Our RESULTS showed that the serum level of 25(OH)D in the VDD group was significantly decreased when compared with the Control group and lower than 20 ng/mL, indicating a successful modeling of VDD mice. The levels of 27-OHC in both serum and brain in the 27-OHC-treated group were remarkably higher than that of the Control mice; and the levels of which in VDD+27-OHC group were higher than that in the single treatment of VDD or 27-OHC. The learning and memory performance, as well as the Aβ deposition and brain histopathological lesions also support this phenotype. However, by using CYP27A1-shRNA, the VDD mice showed decreased serum 27-OHC level. As for the SUMOylation related factors, upregulated expression of SUMO1 gene, and Ubc9 gene and protein were observed in VDD and 27-OHC group. Moreover, significant co-localization of CYP27A1 and SUMO1 in the brain was found, and the Co-IP RESULTS showed that there was interaction between the two proteins. But by inhibiting the SUMOylation, the VDD mice showed the opposite RESULTS.

CONCLUSIONS
This study suggests that VD deficiency induces learning and memory decline by regulating CYP27A1, increasing 27-OHC load in the circulation and brain, exacerbating brain pathological injury and Aβ deposition. The SUMOylation modification of CYP27A1 might be a critical mechanism by which VD deficiency modulates cognitive impairment, but its molecular targets and modification sites are worthy of further investigation.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_058

EFFECTS OF GUBRA AMYLIN NASH (GAN) INDUCED OBESITY ON THE DEVELOPMENT OF NON-ALCOHOLIC FATTY PANCREATIC DISEASE (NAFPD) AND PANCREATIC NAD METABOLISM

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BACKGROUND AND OBJECTIVES
Metabolic dysfunction associated steatotic liver disease (MASLD), previously called non-alcoholic fatty liver disease (NAFLD), has recently gained attention as a major global health problem. Recently, non-alcoholic fatty liver disease (NAFLD) caused by obesity has become a worldwide problem. Recently, a pathology similar to NAFLD has been shown to occur in the pancreas and is referred to as non-alcoholic fatty pancreatic disease (NAFPD). NAFPD is gaining attention with the increasing number of pancreatic cancer patients, but its pathogenetic mechanism is still an enigma.Recently, it has been shown that a pathogenesis similar to NAFLD occurs in the pancreas, and the concept of non-alcoholic fatty pancreatic disease (NAFPD) has been attracting attention, but there are many unknowns. On the other hand, nicotinamide adenine dinucleotide (NAD) is a major redox cofactor and plays important roles in various aspects of metabolism, inflammation and aging. In this study, we aimed to clarify the effects of obesity on the development of NAFPD and on pancreatic NAD metabolism using GAN-induced obesity model mice.

METHODS
Seven-week-old male C57BL/6J mice were fed a Gubra Amylin NASH (GAN) diet containing high fat (40%), high fructose (22%) and high cholesterol (2%) ,samples for 14 weeks (GAN-14), 26 weeks (GAN-26) or 55 weeks (GAN-55). SerumSera from these samples were used for biochemical analysis of aAmylase. For pancreas, Hematoxylin-eosin (HE) and Sirius Red staining was performed on paraffin sections of the pancreas. Aand gene expression levels of fibrosis-related factors, enzymes of NAD biosynthesismetabolic enzyme were examined by gene expression levels quantitative PCR was performed.

RESULTS
GAN-14 and GAN-55 showed a significant increase in Col1a1 gene expression in the pancreas, while GAN-26 showed a significant increase in α-SMA gene expression. In addition, positive Sirius Red staining was observed in all groups. In addition, GAN-55 showed areas of inflammation on HE staining. Thus, it was concluded that pancreatic fibrosis had occurred and progressed in all groups. The expression levels of NAD metabolism-related enzyme genes in GAN-14 and GAN-55 were increased, while there was no overall change in the GAN-26.

CONCLUSIONS
These RESULTS indicate that not only NAFLD but also NAFPD develops and progresses due to GAN-induced obesity, and that NAFLD and NAFPD have different patterns of NAD metabolic changes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_059

IDENTIFICATION OF RECEPTORS INVOLVED IN THE PROCESS OF QUINOLINIC ACID-INDUCED RENAL FIBROSIS

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BACKGROUND AND OBJECTIVES
Recently, the rapid increase in the number of patients with chronic kidney disease (CKD) has led to an increase in the number of dialysis and kidney transplants, which in turn has put pressure on the government financial. Therefore, although it is important to understand the pathogenesis of renal fibrosis, many details remain unclear. Quinolinic acid (QA), an intermediate metabolite of tryptophan, is neurotoxin and uremic toxin. We have shown that QA may be an inducer of renal fibrosis using QPRT knockout mice. However, the detailed mechanisms, in particular the receptive mechanisms of QA in renal tissue, are unknown. Therefore, the present study aimed to identify QA receptors in the kidney.

METHODS
We focused on three QA receptor candidates, aryl hydrocarbon receptor (AhR), receptor for advanced glycation end product (RAGE) and *N*-methyl-*D*-aspartate (NMDA) receptor. The following studies were performed using renal tissue from QPRT knockout mice and human kidney-2 (HK-2) cells. Using renal tissue of QPRT knockout mice (Homo and WT) and human kidney-2 (HK-2) cells, quantitative PCR for above target gene of receptors was performed. And immunohistology analysis (IHC) using antibodies of above target gene of receptors was performed from animal renal tissue.

RESULTS
As a result of real-time PCR, renal tissue of mice (14-week-old), gene expression level of NR2C was significant increase in Homo relative to the WT. In 60-week-old, there was a significant decrease in NR2C, 3A, and RAGE gene expression of Homo compared to WT. IHC of renal tissue showed that NR1 and 2A were markedly decreased in the distal tubules of Homo of 60-week-old, and markedly positive images in the distal and proximal tubules of Homo of 14-week-old. And, there was a significant decrease in AhR and its target genes, RAGE, NR1, NR2B, NR2C, and NR2D in HK-2 cells treated with QA.

CONCLUSIONS
These RESULTS suggested that these changes in the expression and localization of NMDA receptors may be associated with QA inducible renal fibrogenesis. In HK-2 cells, gene expression of almost all receptors was decreased in a concentration-dependent manner, suggesting that QA may involve three receptors in human proximal tubular cells. Therefore, we concluded that renal injury may be caused by a novel mechanism other than the known mechanism of urotoxic-induced renal injury.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_060

HYPOPHYSECTOMY ABOLISHES SEX DIFFERENCES AND PROTEIN DEFICIENCY-INDUCED INCREASE IN HEPATIC VLDLR IN MICE

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BACKGROUND AND OBJECTIVES
The very-low-density lipoprotein receptor (VLDLR) facilitates the uptake of VLDL and its increased expression in the liver has been implicated in hepatic fat accumulation. Previously, we reported that protein deficiency elevates hepatic VLDLR mRNA and protein levels, with female mice showing higher VLDLR expression than males. It is known that protein deficiency induces growth hormone (GH) resistance, and that GH secretion patterns regulate sex-specific gene expression. Additionally, the GH signaling factor STAT5 suppresses VLDLR expression. This study aimed to investigate whether changes in VLDLR expression due to protein deficiency and sex differences are caused by GH.

METHODS
Seven-week-old male and female C57BL/6J mice (10 per group) underwent either hypophysectomy or a sham operation. They were then fed either a control diet containing 20% casein or a low-protein diet with 1% casein for 16 days. Hepatic VLDLR mRNA and protein levels were measured, along with fibroblast growth factor 21 (FGF21) mRNA, a hormone that responds to protein deficiency and regulates lipid metabolism. Serum and hepatic triglyceride (TG) levels were also evaluated.

RESULTS
In sham-operated mice, hepatic VLDLR mRNA and protein levels increased on a low-protein diet, but in hypophysectomized mice, this increase in VLDLR protein was abolished and VLDLR mRNA levels were decreased. In the control diet group, females exhibited higher VLDLR mRNA and protein levels than males, a sex difference that was eliminated by hypophysectomy. Additionally, FGF21 mRNA levels and hepatic TG levels showed sex-specific differences and increased in response to protein deficiency, but these changes were also abolished by hypophysectomy.

CONCLUSIONS
The protein deficiency-induced increase in hepatic VLDLR levels and the sex differences were abolished after hypophysectomy, suggesting that these changes are regulated by GH. Likewise, the changes in hepatic lipids and FGF21 mRNA levels caused by protein deficiency and sex differences were eliminated by hypophysectomy, indicating that GH may also play a key role in regulating these lipid metabolism-related alterations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_061

THE PROTECTIVE EFFECT OF QUERCETIN ON OXIDATIVE DAMAGE TO PC12 CELL

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BACKGROUND AND OBJECTIVES
Oxidative stress-induced neuroinflammation or neurodegeneration may cause to brain cell damage, leading to chronic diseases such as memory decline and cognitive dysfunction. For example Alzheimer's , Huntington's and Parkinson's disease. Quercetin, a phytochemical and a type of flavonoid, has been shown in many studies to possess antioxidant properties and the ability to scavenge free radicals, It is anti-tumor, improves cardiovascular disease, blood sugar, and neuroprotective functions. Quercetin is found in many natural fruits and vegetables, with particularly high concentrations in onions, apples, broccoli, and tea .

METHODS
In this study, we will use quercetin to treat PC-12 cells as a model, and induce oxidative damage in the PC-12 cells with hydrogen peroxide (H2O2).

RESULTS
The RESULTS show that quercetin concentration between 0-30 μM does is non-toxic. According to pharmacology analysis, quercetin was found to exert its effects by influencing the mechanisms of AKT1, HSPB1, HSPD1, and PRNP, activating the PI3K/AKT pathway, promoting neuronal survival, and inhibiting apoptosis. It induces the expression of heat shock proteins (HSPB1 and HSPD1), stabilizes protein folding, reduces the toxicity of misfolded proteins, improves mitochondrial function, decreases oxidative stress, and prevents mitochondria-induced apoptosis. Additionally, it maintains the normal function of PRNP, reducing neurotoxicity and protein aggregation.

CONCLUSIONS
These effects are particularly applicable to the treatment research of Parkinson's disease and Alzheimer's disease, highlighting the potential therapeutic efficacy of quercetin in neurodegenerative diseases.

CONFLICTS OF INTERESTS
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EPO8_062

EFFECTS OF SOY ISOFLAVONE ON MRNA EXPRESSION PROFILE OF MICE FED A HIGH-FAT DIET

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BACKGROUND AND OBJECTIVES
Soy protein, rich in isoflavones and bioactive peptides, has been shown to mitigate metabolic dysfunction-associated fatty liver disease (MAFLD). However, the primary active components and underlying mechanisms remain unclear. Previously, we reported distinct effects of soy protein components on adiposity and circulating microRNA (miRNA) profiles in obese mice. In this study, we compared the effects of soy protein with low and high isoflavone content on hepatic gene expression profiles in mice fed a high-fat (HF) diet. Regulatory networks between circulating miRNAs and hepatic target genes were also investigated.

METHODS
Male C57BL/6J mice were divided into four dietary groups: control (C), high-fat (HF), HF with low-isoflavone soy protein (HF/S), and HF with high-isoflavone soy protein (HF/SI). The experimental diets were administered for 16 weeks. Hepatic transcriptomes were analyzed using microarray technology.

RESULTS
Mice fed an HF/SI diet showed a significant reduction in hepatic steatosis compared to those on the HF diet. Transcriptome analysis identified two distinct clusters (cluster 1: HF and HF/S groups; cluster 2: HF/SI group) among HF-fed mice. Between the HF and C groups, a total of 956 genes showed significant differences (adjusted P-value < 0.05, |fold change| ≥ 1.5). The HF/S diet altered the expression of 129 genes associated with 9 Kyoto Encyclopedia of Genes and Genomes (KEGG) pathways, while the HF/SI diet significantly influenced 624 genes enriched in 86 KEGG pathways. Functional analysis of differentially expressed genes (DEGs) indicated that several of top 10 KEGG and Gene Ontology Cellular Component (GO:CC) terms were related to the endoplasmic reticulum and phagosome in the HF vs. C comparison. Notably, the HF/SI diet reversed the expression of most of these genes, unlike the HF/S diet. In the HF vs. C comparison, half of twelve differentially expressed miRNAs (DEMs) in the serum, including miR-6931-5p and miR-7002-5p, had target genes among hepatic DEGs. All identified two down-regulated DEMs in the HF/SI vs. HF comparison had 8 up-regulated target genes, which were associated with RNA translation and exocytosis.

CONCLUSIONS
HF feeding altered hepatic gene expression, which was more effectively reversed by an HF/SI diet compared to an HF/S diet. These data suggest that soy isoflavones play a key role in alleviating MAFLD in mice. Further studies are warranted to investigate gene expression profiles in other tissues and identify the role of serum miRNAs regulated by soy protein.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_063

HIGH GLUCOSE INHIBITS THE UPTAKE OF LDL CHOLESTEROL BY ENDOCYTOSIS

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BACKGROUND AND OBJECTIVES
Glucose is the primary energy source for cells and is essential for sustaining life activities. However, excessive daily intake of carbohydrates can lead to insulin resistance, increasing the risk of diabetes. Moreover, chronic hyperglycemia promotes atherosclerosis, thereby raising the risks of heart disease, cerebrovascular disorders, and even mortality. On the other hand, small GTP-binding protein Rab5 is a key protein involved in endocytosis, including the uptake of LDL cholesterol. However, the molecular mechanisms through which hyperglycemia affects endocytosis remain largely unclear. Therefore, in the present study, we analyzed the dynamic changes in endocytosis under hyperglycemic conditions using cells cultured in a high-glucose medium.

METHODS
For the following experiments, A549 cells cultured in normal glucose concentration medium and high glucose concentration medium were used as samples. Co-localization of Rab5 and EEA1 was observed by fluorescence microscopy after immunostaining with specific antibodies for each protein. Co-localization was quantified by calculating the Pearson coefficient using ImageJ. The activity of Rab5 was analyzed by the GST-R5BD pulldown method reported by Hagiwara et al. LDL-cholesterol uptake was measured by adding pH-rode LDL to cells and measuring it with a fluorescent macroplate reader. Phosphorylation of MAPK and inflammation-related factors were analyzed by Western blotting.

RESULTS
The colocalization of Rab5 with the early endosome marker EEA1 was significantly reduced in cells cultured in high-glucose medium compared to those cultured in normal-glucose medium. Additionally, Rab5 activity was found to be decreased in high-glucose medium-cultured cells relative to normal-glucose medium-cultured cells. Furthermore, LDL cholesterol endocytosis was significantly reduced in high-glucose medium-cultured cells compared to normal-glucose medium-cultured cells. Furthermore, it was revealed that high glucose promotes inflammation via MAPK signaling.

CONCLUSIONS
It is clear that hyperglycemia reduces Rab5 activity and inhibits endocytosis of LDL cholesterol. High glucose may accumulate cholesterol in the blood by inhibiting endocytosis via inflammation-related factors.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_064

THE IMPACT OF MULTIPLE MICRONUTRIENT SUPPLEMENTATION ON BREASTMILK MICRONUTRIENT CONCENTRATIONS

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BACKGROUND AND OBJECTIVES

Supplementation with multiple micronutrients (MMS) during pregnancy compared to Iron and folic acid alone has been shown to improve birth outcomes. However, little is known of whether MMS during pregnancy additionally impacts breastmilk micronutrient concentrations. Breastmilk is the most suitable food for infants and for an exclusively breastfed child, their micronutrient intake is dependent on the breastmilk micronutrient concentrations. Therefore, we sought to systematically review literature to determine the impact of MMS on breastmilk micronutrient concentrations.

METHODS

PubMed, Embase, Scopus and Cochrane databases were searched using relevant key words from the year 1990 to September 2023. We included articles written in English which investigated breastmilk micronutrient concentrations after MMS. Articles that reported supplementation with multiple micronutrients during lactation period only were excluded.

RESULTS

We found 1558 records from the electronic databases. After removing duplicates and irrelevant articles, 818 records were screened according to the title and abstract. Subsequently, 174 records were critically screened, and 22 records were included in this review. Micronutrients studied included Vitamins A, B, D and E, iodine, zinc, calcium, copper, magnesium, manganese, phosphorus, potassium, selenium, and sodium. From the included studies, 16 studies reported increased breastmilk micronutrients levels of Vitamins A, B1, B9, B12 and E, iodine and zinc among the intervention arm compared to the comparator while 6 studies reported no significant differences in breastmilk Vitamins A and B12, iodine, iron, copper, magnesium, manganese, phosphorus, potassium, selenium and sodium.

CONCLUSIONS

There are conflicting findings on the effect of multiple micronutrient supplementation during pregnancy on breastmilk micronutrient levels. These differences may arise from variations in the supplementation, the specific micronutrient biomarkers measured in breastmilk, the analytical methods used to analyze these biomarkers and dietary composition. Further research is needed to determine the optimal dosing and composition of supplements during pregnancy to maximize its impact on breastmilk micronutrient levels. Additionally, harmonization of methods used in breastmilk analysis is needed to facilitate comparisons across studies.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_067

THE ESTABLISHMENT OF A NOVEL DIABETIC RETINOPATHY-LIKE ANIMAL MODEL

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BACKGROUND AND OBJECTIVES
Type 2 diabetes mellitus (T2DM) is a metabolic disease characterized by hyperglycemia and hyperinsulinemia. Poor long-term glycemic control leads to both microvascular and macrovascular complications, with approximately 20% of diabetic patients developing diabetic retinopathy (DR). DR may progress to complications such as macular edema, neovascular glaucoma, or even retinal detachment, potentially resulting in blindness once without early intervention. The aim of this study is to establish an DR-like animal model by inducing T2DM through streptozotocin (STZ) injection and a high-fat diet (HFD), and subsequently inducing retinal damage with sodium iodate (SI).

METHODS
Sprague-Dawley (SD) rats were fed a high-fat diet (54% of calories from fat) for 4 weeks. Subsequently, STZ was administered intraperitoneally at a dose of 35 mg/kg body weight (b.w.) for two consecutive days. After successful induction of hyperglycemia, SI (30 mg/kg b.w.) was then administered intraperitoneally to induce retinal damage. Upon confirmation of retinal function abnormalities, metformin (MET) was administered as a positive control at a dose of 200 mg/kg b.w. once daily for 4 weeks. Retinal function was assessed using electroretinography (ERG) at week 0th and 4th to diagnose the induction of retinopathy. Blood biochemical analysis and the oxidative status of retinal tissue were evaluated after the rats were sacrificed.

RESULTS
The ERG RESULTS at the 4th week showed that the a- and b-wave amplitudes were significantly decreased in DR-like rats compared to control rats ($p<0.05$). However, the b-wave amplitudes were significantly increased in metformin-treated DR-like rats compared to the DR-like rats ($p<0.05$). Fasting blood sugar analysis revealed that the rats in the DR and MET groups were hyperglycemic (>200 mg/dL) after 6 weeks of STZ injection and HFD feeding. The oxidative status of the retinal tissue showed that malondialdehyde levels were significantly increased in DR-like rats compared to control rats ($p<0.05$), and decreased in MET-treated DR-like rats compared to DR-like rats.

CONCLUSIONS
In conclusion, the RESULTS demonstrate that the combination of STZ and SI injection can rapidly induce retinopathy syndrome via hyperglycemia, and metformin may suppress the progression of retinopathy by reducing oxidative stress in DR-like rats.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_068

MEASURING COMMUNICATION IN MICROBIAL BIOFILMS IN RESPONSE TO ANTIBIOTICS, PHYTOCHEMICALS AND STRESSORS

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BACKGROUND AND OBJECTIVES

In their natural environment, bacteria can grow in biofilms that are often resistant to antibiotics and disinfectants in wounds, infectious diseases and implantable devices. The communication mechanisms between the bacteria are also different in biofilms compared to planktonic cultures. However, it has been challenging to develop assays that can measure changes in signaling and communication within the biofilm in response to antibiotics, disinfectants and phytochemicals and to assign a physiological function to these changes.

METHODS

A high-throughput assay system is developed for measuring communication in microbial biofilms in a 96-well microtiter plate format. In this assay, bioluminescent microbial whole cell biosensor systems (MWCBs) embedded into the biofilm were exposed to gradients of quorum sensing molecules (QSMs) such as N-acetyl-homoserine lactones (AHLs), or 3,5-dimethylpyrazin-2-ol (DPO), and the response pattern monitored. Increasing concentrations of phytochemicals that can act as natural quorum sensing inhibitors (QSIs) such as curcumin (from *Curcuma longa*), or 3,3'-diindolylmethane (DIM) (from cruciferous vegetables) were tested for their ability to modulate communication in response to QSMs. Further, the regulatory role of disinfectants (e.g., H2O2) or antibiotics (e.g., ciprofloxacin, trimethoprim/sulfamethoxazole)) on the communication responses were assessed.

RESULTS

Curcumin and DIM at higher concentrations lead to inhibition of quorum sensing in biofilms after 4h and 24h and is not followed by biofilm disintegration. H2O2 above 0.002% efficiently inhibited the activity of the biosensors and was leading to biofilm disintegration. At lower concentrations of H2O2 we observed induction of the MWCBs. The antibiotics inhibited the MWCBs activity at concentration above their minimal inhibitory concentration (MIC), but this did not necessarily lead to the disintegration of the biofilm. Interestingly, similar to low concentrations of H2O2, the antibiotics activated the MWCBs at concentrations close to their MIC, possibly as result of H2O2 generated during their bactericidal action.

CONCLUSIONS

We hypothesize that the observed response to stressors reflects increased communication in the bacterial biofilm. A detailed analysis of the molecular signaling mechanisms by which phytonutrients and stressors modulate communication in biofilms will not only be important to understand chronic infection but also for identifying novel mechanisms involved in developing antibiotic tolerance and resistance.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_069

IDENTIFICATION OF NEW PEPTIDES FROM PEA PROTEIN ISOLATE IMPLICATED IN GLUCOSE METABOLISM AND FOOD INTAKE REGULATION

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BACKGROUND AND OBJECTIVES
Dietary proteins, mainly from animal sources, and their digestates, through peptides and amino acids generated during digestion, exhibit numerous biological functions beneficial to prevent or treat pathological conditions. Proteins stimulate intestinal hormones like glucagon-like peptide 1 (GLP-1) and cholecystokinin (CCK), influencing short-term food intake via enteroendocrine cells (EECs). GLP-1 promotes insulin secretion, inhibits glucagon release, and, like CCK, signals satiety. However, GLP-1's rapid inactivation by dipeptidyl peptidase IV (DPP-IV) limits its efficacy. Protein-rich diets, including plant-based proteins ones, have been linked to reduced obesity risk, improved glucose regulation, and type 2 diabetes prevention. This study aimed to identify new bioactive peptides, generated during simulated gastrointestinal digestion of pea protein isolate NUTRALYS® S85F from Roquette (PPI), that stimulate CCK and GLP-1 secretion in EECs and inhibit DPP-IV activity after intestinal barrier (IB) passage.

METHODS
In vitro digestion followed the INFOGEST protocol, modified to include brush border peptidases and duodenal absorption using a Caco-2/HT29-MTX IB model. DPP-IV inhibitory activity was evaluated in human plasma using a specific fluorescent substrate, and IC50 values were determined. CCK and GLP-1 secretion by STC-1 EECs were quantified via ELISA after incubation with digested samples. Fractionation of digested PPI was performed using strong cation exchange chromatography and reversed-phase HPLC. Bioactive fractions were analyzed by peptidomics to identify novel peptides. Selected peptides were synthesized and tested for hormone secretion and DPP-IV inhibition. Peptides capable of crossing the IB were identified using the Caco-2/HT29-MTX model.

RESULTS
Several novel peptides derived from pea protein were identified, exhibiting dual bioactivity by stimulating CCK secretion, GLP-1 secretion, or both. Additionally, peptides capable of crossing the intestinal barrier demonstrated significant DPP-IV inhibitory activity in human plasma, with promising low IC50 values.

CONCLUSIONS
The findings highlight the potential of pea protein-derived peptides in preventing and managing obesity and type 2 diabetes. These RESULTS support the development of plant-based functional foods tailored for personalized nutrition and would deserve further studies in humans.

CONFLICTS OF INTERESTS
Catherine Lefranc-Millot & Caroline Perreau are employees of Roquette (France)

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EPO8_072

EFFECT OF EGG CONSUMPTION ON COGNITION IN HEALTHY OLDER ADULTS: FINDINGS FROM A RANDOMISED CONTROLLED TRIAL

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BACKGROUND AND OBJECTIVES
Eggs are rich in nutrients beneficial for cognitive function, such as phospholipids, choline, and tryptophan. However, most research on egg consumption and cognition has been observational, mainly addressing cognitive decline with aging. Few studies have investigated the effects of egg intake on cognition in healthy older adults, with a lack of high-quality study designs.

METHODS
This 6-week long, parallel-arm randomized controlled trial (RCT) aimed to examine the impact of egg consumption on cognition, including interoception, risk-taking, decision-making and reaction-time in healthy older adults. Forty-eight healthy adults aged over 65 were randomised to either the intervention group (n=24) who consumed 2 whole eggs/day, or the control group (n=24) who avoided eating eggs. Participants completed 4 computer-based validated cognitive tests at week 0 and week 6. The Schandry task measured interoception (heartbeat perception (Hb) in 25s, 35s and 55s rounds), the balloon analogue risk task (BART) measured risk-taking, the Iowa Gambling Task (IGT) assessed decision-making, and the Deary-Liewald test measured simple reaction time (SRT) and choice reaction time (CRT). Changes in cognitive task RESULTS within and between groups were analysed via linear mixed models analysis using SPSS, with RESULTS controlled for sleepiness (measured by Karolinska Sleepiness Scale) and gender. Continuous data is presented as mean ± SD where parametric, or median (IQR) where non-parametric.

RESULTS
Of the n = 48 participants enrolled, n = 45 completed the 6-week program and were included in data analysis (egg n=23, control n=22). Participants were 70% female, aged 69.0 (5) years and exhibited BMI of 25.2 ± 3.2 kg/m2 . At week 0, cognitive task RESULTS between intervention and control groups were not significantly different. At week 6 interoception was not impacted by egg consumption (Hb: 25s p = 0.242; 35s p = 0.273; 55s p = 0.341), nor was risk-taking (BART p = 0.235), decision making (IGT p = 0.529), or reaction-time (SRT p = 0.627, CRT p = 0.831).

CONCLUSIONS
Consuming 2 eggs/day for 6-weeks did not affect cognitive test RESULTS in healthy older adults when compared to those who avoided eggs, indicating no negative impact from regular egg consumption. This is the first RCT to examine the effects of egg intake on these cognitive parameters. Future studies should consider longer interventions or different cognitive tests to fully understand the potential cognitive effects of egg consumption.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_073

EFFECT OF PUPALIA LAPPACEA, IRESINE HERBSTII, FICUS CAPENSIS AND MORINDA LUCIDA LEAF EXTRACTS ON PHENYLHYDRAZIN-INDUCED ANAEMIC ADULT MALE ALBINO WISTER RATS

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BACKGROUND AND OBJECTIVES
Anemia remains a major public health issue worldwide, with an estimated 40% of children under five and one-third of women of reproductive age affected. While conventional treatments are available, there is growing interest in the potential of medicinal plants as safer, alternatives for managing anemia. The study determined the effect of *Pupalia lappacea, Ipomoea herbstii, Ficus capensis and Morinda lucida leaf extracts* on phenylhydrazin-induced anaemic rats.

METHODS
The wild leaves (*Pupalia lappacea, Ipomoea herbstii, Ficus capensis and Morinda lucida*) were collected from the bush and fallow lands in villages. The leaves were cleaned and shade-dried at room temperature for seven days. The dried samples were milled separately into homogeneous powders of 60 µm using a laboratory hammer mill. Methanol extracts of the powdered samples were separately prepared by cold maceration. Acute toxicity test (LD50) was conducted to determine safe levels of the extracts. Adult male Wistar rats (n=120) were acclimatized and randomly assigned into five groups of six rats for each leaf extract. Anaemia was induced using phenylhydrazine and confirmed before treatment commenced. Based on that the established safe levels, three doses of the extracts (10, 100, 1000 mg/kg body weight) were administered orally to Groups C, D, and E, respectively for 14 days. Groups A served as the untreated control, while Group B received a standard drug for anaemia. Blood samples were collected via retro-orbital puncture under ether anesthesia and analyzed for packed cell volume (PCV), red blood cell count (RBC), and hemoglobin (Hb). Data were analyzed using SPSS (version 23), and statistical significance was set at $p < 0.05$.

RESULTS
A significant increase ($p < 0.05$) in PCV, RBC and Hb levels was observed from baseline and end-line values in all groups treated with different doses of the leaf extracts. These increases were comparable to those observed in rats treated with the standard drug for anaemia.

CONCLUSIONS
The study revealed that the leaf extracts of *Pupalia lappacea, Ipomoea herbstii, Ficus capensis and Morinda lucida* significantly improved the hematological parameters, particularly PCV, RBC count, and Hb levels in phenylhydrazine-induced anemic adult male albino Wistar rats. These findings suggest that the plant extracts have potential therapeutic effects on anemia and could be further explored as natural remedies, especially in regions with limited access to conventional treatments.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_076

BARRIERS AND ENABLERS OF SELECTED NUTRITION AND AGRICULTURAL PRACTICES AMONG WOMEN AND CHILDREN IN SIX SUB-REGIONS AND REFUGEE SETTLEMENTS OF UGANDA

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BACKGROUND AND OBJECTIVES

Women play a crucial role in ensuring that nutritious foods are available and consumed by children. However, their effectiveness is shaped by a complex interaction of barriers, enablers, and motivators unique to each community and region. This study examines the barriers and enablers related to key nutritional and behavioral practices in six sub-regions of Uganda. The aim was to understand the factors that influence optimal food production, access, and consumption practices among women and children.

METHODS

The Barrier Analysis methodology was used in the current study. Data were analyzed with Excel for tabulation and Atlas.ti for qualitative insights. Ethical clearance for this study was obtained from the Clarke International University Research Ethics Committee and the Uganda National Council for Science and Technology

RESULTS

RESULTS showed that doers in Karamoja and Acholi were more likely to meet MMF, benefiting from better access to food and community support, while non-doers in Kamuli were 12.5 times more likely to perceive negative consequences from missing MMF (p=0.007). Regarding dietary diversity, doers in Tooro and Lango consistently reported better access to diverse food groups, while non-doers, especially in refugee settlements, struggled with food rationing (p=0.002). Women's dietary diversity also followed a similar pattern, with doers in Acholi and Tooro benefiting from better access to agricultural resources (p=0.024).

Other enablers identified include savings and loan associations, which were key to improving dietary diversity, particularly in Lango and West Nile, where households participating in savings programs were more likely to invest in nutrient-dense foods (p=0.014).

In refugee settlements, non-doers struggled with food rations (3.7 times, $p = 0.040$), financial constraints (4.1 times, $p = 0.002$), and limited resources, while doers benefited from cultivation and livestock (33% facilitation, $p < 0.01$) and greater confidence (26% more, $p = 0.001$). Key interventions include improving food access, financial aid, and agricultural support.

CONCLUSIONS

Optimal nutrition was significantly influenced by access to resources such as land, agriculture, and financial stability. Non-doers encountered substantial barriers, including financial constraints, land scarcity, and farming difficulties, particularly in areas like Karamoja, Tooro, and West Nile.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_077

THE NUTRITIONAL CONTRIBUTION AND RELATIONSHIP WITH HEALTH OF BREAD CONSUMPTION

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BACKGROUND AND OBJECTIVES
Bread is one of the most widely consumed staple foods globally, with a long history and strong cultural associations. However, the perception of bread as a nutritious and health-promoting food remains unclear. The objective of this comprehensive review is to critically evaluate the epidemiological and clinical evidence on the nutritional contribution of bread and its relationship with various health outcomes.

METHODS
We conducted a broad search using PubMed, the MeSH database, and Google Scholar, with keywords including "bread", "overweight", "obesity", "cardiometabolic disease", "cardiovascular disease", "type 2 diabetes", "digestive health", and "risk factors" (e.g., blood lipids, glucose, insulin, BMI). The included studies were epidemiological, observational, and clinical trials investigating the relationship between bread, assessed either alone or as part of a dietary pattern, and health. Additionally, we searched for official reports from global Nutrition and Health Authorities, as well as publications on the nutritional composition of bread.

RESULTS
Our review confirmed that bread makes a significant contribution to the intake of key nutrients in various regions of the world. However, the evidence on the health effects of bread is complex. We did not observe clear evidence that bread intake, as a broad category, is linked to the risk of obesity, cardiometabolic disease, or digestive health issues. Importantly, the review highlighted the proven benefits of whole grain bread on metabolic and digestive health, in addition to its favorable nutrient profile. Emerging evidence also suggests potential health benefits associated with breads made from other whole grains, such as oat, barley, and rye.

CONCLUSIONS
This comprehensive review critically appraised the available evidence to address the question of whether bread consumption is related to health and disease. From a nutritional standpoint, bread, especially whole grain varieties, makes a significant contribution to energy and key nutrient intakes. The association between bread and health is complex, and no strong evidence establishes a causal relationship between bread consumption and disease. However, whole grain bread has shown benefits over refined breads and other staple foods, such as improved body weight regulation, cardiometabolic health, and digestive health.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_080

EFFECT OF A WORKPLACE HEALTH PROMOTING ACTIVITIES ON EMPLOYEE'S EATING BEHAVIOR IN HOSPITAL

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BACKGROUND AND OBJECTIVES
According to the reported data of WHO, noncommunicable diseases (NCDs) kill 41 million people each year. Health promotion strategies that encourage healthy eating are critical in preventing NCDs. Developing and implementing worksite health promotion program in hospital can create a health-supporting workplace for healthcare worker. As this reason, the aim of the study was to implement a health promoting activities in the hospital canteen, and examine the effect on employee's eating behavior.

METHODS
A 9-month workplace health promotion program was implemented in the hospital canteen. We recruit 100 subjects from employees who always buying dining in the canteen. This study intend to encourage healthy eating through a series of interventions, which include " the meal with red, yellow and green color-coded calorie labeling ", " real food of my balance plates exhibition and video education", "purchase of unrefined whole grains can be discounted on meal expenses" . A questionnaire survey on "Healthy Eating Knowledge and Behavior" was conducted before and after the study, and the total times of purchases of unrefined whole grains during the program was also collected to investigate the changing of eating behavior.

RESULTS
A total of 75 adult participants (males = 7, female = 68; mean age 43.6y) who had completed pre- and post-surveys were included in the analysis. The scores of healthy eating behaviors (HEB) stage ranged from 1 to 5 with a mean of 2.88 and 3.45 before and after the study respectively. (1=precontemplation, 2=contemplation, 3=preparation, 4=action, 5=maintenance). The percentage of all participants in the HEB action and maintenance stages was 33 % before and increased to 60 % after the study. The healthy eating consciousness measured by three questions with five-point Likert Scales had a mean of 4.0 in pre and 4.36 in post study. The total times of purchases of unrefined whole grains increased by 2,521 for all participants in the study, and intake of unrefined whole grains increased by an average of 19% compared to pre-study.

CONCLUSIONS
Although healthcare workers are relatively well aware of healthy eating, the RESULTS of this study suggest that multi-strategy interventions are effective in advancing the stage of healthy eating behaviors and increasing their willingness to purchase unrefined whole grains. Research suggests that this may be an effective intervention strategy to achieve behaviour change.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_081

NEUROPROTECTIVE POTENTIAL OF ECKLONIA CAVA POLYPHENOLS FOR PARKINSON'S DISEASE PREVENTION: ACTIVATION OF THE NRF2-ARE PATHWAY

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BACKGROUND AND OBJECTIVES
Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by the degeneration of dopamine-producing neurons in the substantia nigra, leading to motor impairments, cognitive decline, and non-motor symptoms. Oxidative stress plays a pivotal role in PD pathogenesis, highlighting the need for novel preventive and therapeutic strategies. This study explores the potential of *Ecklonia cava* polyphenols (ECPs**)**, rich in the antioxidant phlorotannin, to mitigate oxidative damage and protect neurons via activation of the Nrf2–antioxidant response element (ARE) pathway.

METHODS
For *in vitro* experiments, SH-SY5Y human neuroblastoma cells were cultured in Dulbecco's Modified Eagle's Medium supplemented with 10% fetal bovine serum. For *in vivo* studies, a PD mouse model was created by administering rotenone (10 mg/kg body weight) orally for 30 days. Motor functions were assessed using the pole test (to measure movement slowness) and the wire hang test (to evaluate grip strength).

RESULTS
In vitro, ECP treatment enhanced the activity and expression of NAD(P)H quinone oxidoreductase-1 (NQO1), promoted nuclear translocation of Nrf2, and increased p62 expression, sustaining Nrf2 activation via a positive feedback loop. These effects were attenuated by Compound C, an AMPK inhibitor, indicating an AMPK-dependent mechanism of Nrf2 activation.
In vivo, ECPs significantly improved motor performance in rotenone-treated mice, restored intestinal motility, preserved colonic tissue integrity, and increased tyrosine hydroxylase (TH) expression in the substantia nigra, demonstrating protection of dopaminergic neurons.

CONCLUSIONS
This study reveals that ECPs exert neuroprotective effects by activating the Nrf2–ARE pathway, alleviating neuronal damage, and improving motor and gastrointestinal dysfunction in a PD mouse model. These findings suggest that ECPs hold promise as a natural, innovative approach to preventing PD. Further research is warranted to elucidate the detailed mechanisms of ECP action and its potential clinical applications.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_083

NUTRITIONAL INTAKE IN A MILITARY CONTEXT: IN THE FIELD, ON BASE AND AT HOME

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BACKGROUND AND OBJECTIVES
Adequate and sufficient nutrition is a necessity for military personnel to perform at their best. Inadequate nutrition can lead to reduced health and performance, and an increased risk of injuries and dropouts. Little is known about the nutritional intake within the Dutch military. Therefore, the current study focusses on energy, nutrient and fluid intake of Dutch soldiers in the field, on base and at home.

METHODS
72 soldiers from the Dutch light armoured brigade were included in this study. In the field, where soldiers use rations, a food intake/waste method was used. Participants were asked to hand in their packaging waste and fill out questionnaires to assess their energy, nutrient and fluid intake. On base and at home, participants recorded their dietary intake using online food diaries. Nutritional intake was compared to reference guidelines. Energy intake on base and at home was also compared to energy expenditure which was measured using online questionnaires. Energy expenditure data in the field was not available for this study.

RESULTS
Carbohydrate and fibre intake were below the reference values in all three settings, while protein and fluid intake met the recommended levels. (Saturated) fat intake was higher than the reference values in all three settings. Sodium intake was above recommended levels at home and on base, but adequate in the field. Energy intake was below the reference intake in all three settings and below energy expenditure on base. At home, energy intake and expenditure were approximately comparable.

CONCLUSIONS
Despite known risks of over- and underreporting in dietary and physical activity assessment, the findings suggest that participants in this study consumed insufficient energy in the field and on base. Since carbohydrate and fibre intake were below the reference values in all three settings, increasing fibre-rich carbohydrate consumption would be the most effective strategy to address the energy shortfall. Enhancing energy intake, particularly in the field, is expected to improve military performance.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_084

CHENOPODIUM FORMOSANUM EXTRACT INHIBITS TNFA-INDUCED ROS PRODUCTION AND ROS-MEDIATED ENDOTHELIAL TO MESENCHYMAL TRANSITION AND INFLAMMATION VIA INDUCTION OF ANTIOXIDANT ENZYMES IN HUMAN ENDOTHELIAL CELLS

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BACKGROUND AND OBJECTIVES
Tumor necrosis factor-α (TNF-α), a proinflammatory cytokine, has been shown to induce the production of reactive oxygen species and lead to endothelial dysfunction. *Chenopodium formosanum*, also known as Djulis, is an amaranthaceae chenopodioideae chenopodium plant. The extract of *Chenopodium formosanum* (CFE) contains several flavonoid compounds exerting antioxidative, anti-inflammatory, and antiadipogenic properties. However, the mechanism of CFE in protecting the endothelial function has not been clarified. Tumor necrosis factor-α (TNF-α), a proinflammatory cytokine, has been shown to induce the production of reactive oxygen species and lead to endothelial dysfunction. *Chenopodium formosanum*, also known as Djulis, is an amaranthaceae chenopodioideae chenopodium plant. The extract of *Chenopodium formosanum* (CFE) contains several flavonoid compounds exerting antioxidative, anti-inflammatory, and antiadipogenic properties. However, the mechanism of CFE in protecting the endothelial function has not been clarified.

METHODS
In this study, EA.hy926 human vascular endothelial cells were used to investigate the effect of CFE on TNF-α-induced inflammation, adhesion, Endothelial-to-mesenchymal transition (EndMT), and oxidative stress.

RESULTS
The RESULTS showed that treatment with 10 ng/mL TNF-α did not affect cell viability, but significantly increased reactive oxygen species (ROS) production, and the phosphorylation of JNK, ERK, p38 mitogen-activated protein kinases (MAPKs), protein kinase B (PKB/Akt) and signal transducer and activator of transcription 3 (STAT3). Moreover, the nuclear translocation of nuclear factor kappa-B (NF-κB) and the protein level of vascular cell adhesion protein-1 (VCAM-1), intercellular adhesion molecule-1 (ICAM-1), interleukin-1 beta (IL-1β), interleukin-6 (IL-6) as well as EndMT-relate protein such as vimentin, but VE-cadherin were increased by TNF-α. Pretreatment with 150 μg/mL CFE significantly increased superoxide dismutase 1 (SOD1), superoxide dismutase 2 (SOD2), glutathione reductase (GR), catalase as well as heme oxygenase-1 (HO-1), and decreased TNF-α mediated ROS production, p-ERK, p-Akt, p-JNK, VCAM-1, ICAM-1, IL-1β, IL-6, vimentin, and VE-cadherin.

CONCLUSIONS
In conclusion, CFE can inhibit TNF-α induced ROS production, ERK/NF-κB, JNK/NF-κB, Akt/NF-κB as well as STAT3, and decrease inflammation, adhesion, EndMT by upregulating antioxidant enzymes in EA.hy926 cell to improving vascular endothelial dysfunction.

CONFLICTS OF INTERESTS
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EPO8_086

IMPACT OF DAIRY GALACTO-OLIGOSACCHARIDE ON THE ELDERLY MICROBIOME : AN IN VITRO STUDY

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BACKGROUND AND OBJECTIVES
Prebiotics are substrates selectively utilized by host microorganisms conferring a health benefit. If the prebiotic effect of galactooligosaccharides (GOS) is well-known, only few studies investigated their effects in elderly population which is concerned by a microbiota shift around 55 years old. The aim of the study was to investigate in vitro the prebiotic effect of a long-term repeated exposure to dairy GOS (SICAGOS) in a healthy elderly donor.

METHODS
The faecal inocula of ten healthy elderly donors were tested in a pre-screening experiment to identify a representative donor. The SHIME® experiment consisting in three bioreactors mimicking the human digestive system: one for the stomach and small intestine, one for the proximal colon and the last one for the distal colon was realised with repeated administration of 4 g/d of SIGAGOS for 3 weeks. This first stage of digestion mimics the alterations that SICAGOS undergoes before reaching the microbiota in humans. We investigated the effects of SICAGOS on the metabolic activity and composition of the gut microbiota (lactate, ammonium, SCFA and branched SCFA), quantitative 16S targeted sequencing and on gut barrier integrity and inflammation using a Caco-2/THP-1 co-culture cell model, in comparison with a negative control, without treatment.

RESULTS
The decrease in pH and SCFA productions observed in all tested elderly donors indicated that the SICAGOS was efficiently fermented by the gut microbiota. During the long-term SHIME® experiment, the microbial fermentation was increased. Indeed, all SCFA rose, in both colonic regions. It was especially true for acetate that represented approximately 60% of the increase and for butyrate that reach 10.7mM in control but 12.8mM with treatment, in proximal colon, and, respectively, 12.2 mM against 15.8mM in distal colon. Also, *Bifidobacteria* were much more numerous with the SICAGOS consumption. Indeed, they represent around 0.49% of abundances in control, but rose to 6.1% with SICAGOS. Finally, SICAGOS had no effect on the gut barrier integrity, but the secretion of IL-10 and NF-kB activity were significantly higher in the distal colon.

CONCLUSIONS
Repeated exposure of dairy GOS (SICAGOS) showed interesting effects by boosting SCFA production, IL-10 secretion, NF-κB activity and upregulating *Bifidobacterium.*, might be associated to an enhance of anti-inflammatory properties. These RESULTS pointed out the potential prebiotic effect of SICAGOS in elderly which could be studied more precisely through a clinical investigation.

CONFLICTS OF INTERESTS
Author A. Cauchoix is employed by Sodiaal.Author B. Choque is employed by Sodiaal.Author J. Pourprix is employed by Euroserum, a company member of Sodiaal.Author M. Lemaire is employed by Sodiaal.

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EPO8_087

COMPARISON OF PROTEIN DIGESTION KINETICS: IMPLICATIONS FOR NUTRITIONAL APPLICATIONS

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BACKGROUND AND OBJECTIVES
Depending on digestion and hydrolysis rates, proteins can be classified as "fast" or "slow." The use of "fast" digesting proteins helps overcome "anabolic resistance" (reduction in skeletal muscle sensitivity/response to anabolic stimuli) by stimulating protein synthesis and improving muscle function. The objective of this study was to evaluate the release kinetics of plant-based proteins using an in vitro gastrointestinal digestion protocol.

METHODS
Six protein isolates were analyzed: tepary bean (TB), fava bean (FB), rice (RC), soybean (SB), corn (CN), and pea (PE). Digestibility, bioaccessibility, and release rates were determined and compared to whey protein isolate (WP) and casein (CA) using an in vitro gastrointestinal digestion protocol (INFOGEST). Digestion rates were measured every 30 minutes, and protein bioaccessibility was simulated using a 10 kDa dialysis membrane. Protein concentration was quantified by the Dumas and Lowry methods for all samples, and kinetic parameters were analyzed.

RESULTS
Animal-derived proteins WPI and CA achieved the highest digestibility percentages (99% and 96%, respectively) compared to plant-based proteins (ranging from 82% to 71%) in the following order: CN, PE, FB, SB, TB, and RC. Regarding bioaccessibility, RC showed the highest value, comparable to WPI, while TB, SB, and CA exhibited the lowest values. Statistical analysis of release rates grouped TB and FB with CA, categorizing them as “slow” proteins. None of the plant-based proteins demonstrated a release rate comparable to the "fast" WPI. Therefore, protein isolates from PE, CN, RC, and SB can be categorized as “intermediate-digesting” proteins.

CONCLUSIONS
Among plant-based proteins, there are promising options for various metabolic applications. Proteins from PE, CN, and RC exhibit intermediate digestibility profiles, making them suitable for contexts requiring early amino acid availability, such as pre-workout scenarios. On the other hand, FB and TB exhibit characteristics of slow-digesting proteins, suitable for applications requiring sustained amino acid release. None of the plant-based proteins matched the release rates of WPI, highlighting the need to optimize production processes and formulations for these isolates. This study reinforces the value of plant-based proteins for specific applications and promotes their integration into sustainable and personalized nutritional strategies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_088

ESTABLISHMENT OF A CELLULAR SENESCENT MODEL OF HUMAN IPS CELL-DERIVED INTESTINAL ORGANOIDS: A NOVEL RESEARCH TOOL FOR NUTRITION IN THE ELDERLY

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BACKGROUND AND OBJECTIVES

In the elderly, intestinal functions such as barrier integrity and nutrient absorption tend to decline, and intestinal aging is linked to systemic aging. However, the direct assessment of human intestinal aging is challenging; thus, detailed mechanisms and effective prevention methods are not well established. In this study, we developed a cellular senescence model by using human iPS cell (iPSC)-derived intestinal organoids as an in vitro evaluation system that mimics human intestinal aging.

METHODS

iPSC-derived intestinal organoids cultured in a monolayer were treated with cisplatin, an anticancer drug, or butyrate, a compound with HDAC inhibitory activity, for 3–5 days. Cellular senescence was evaluated by gene expression analysis of p16 and p21, markers of cell cycle arrest, and IL8 and TNFα, components of the senescence-associated secretory phenotype, using qPCR. Cellular senescence was also examined by staining the cells with SA β-gal. Transepithelial electrical resistance (TEER) was measured as an indicator of intestinal barrier function. RNA-seq analysis, followed by differential gene expression and KEGG pathway analyses, was performed.

RESULTS

Treatment with cisplatin (10–20 μM) and butyrate (20–30 mM) increased the gene expression of p16 and p21, as well as IL8 and TNFα, and increased the number of SA β-gal-positive cells, indicating the induction of cellular senescence. Additionally, in the cisplatin-treated model, the TEER values decreased. KEGG pathway analysis revealed that the *p53 signaling pathway* was upregulated after treatment with 20 μM cisplatin for five days, consistent with the induction of cellular senescence. Furthermore, several pathways related to nutrient absorption and metabolism were downregulated by cisplatin treatment, partially simulating age-related decline in nutrient absorption. Finally, we explored food components that suppress intestinal cellular senescence using the cisplatin-treated model and identified certain food components that attenuate cisplatin-induced changes.

CONCLUSIONS

This study is the first to evaluate the efficacy of food components in a cellular senescent iPSC-derived intestinal organoids that exhibit a decline in intestinal barrier function and nutrient metabolism. This model could serve as an effective research tool for establishing preventive methods against human intestinal aging and nutritional disruption in the elderly.

CONFLICTS OF INTERESTS

TA and TK are employees of Kirin Holdings Company, Limtied.

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EPO8_090

ACA EXHIBITS ANTI-OBESITY EFFECTS BY ACTIVATING AMPK AND INHIBITING CREB TRANSCRIPTIONAL ACTIVITY

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BACKGROUND AND OBJECTIVES
Obesity, affecting over one billion people worldwide, arises from an imbalance between energy intake and expenditure, leading to excessive fat accumulation and an elevated risk of chronic conditions such as type 2 diabetes and metabolic disorders. Despite the potential benefits of lifestyle modifications, sustainable weight loss remains challenging, and concerns about the safety of anti-obesity drugs have driven interest in natural compounds. 1'-acetoxychavicol acetate (ACA), a bioactive compound derived from the wild ginger *Alpinia galanga*, has demonstrated anti-obesity effects in both in vitro and in vivo studies. However, the precise mechanisms underlying these effects are not fully understood. This study investigates the molecular mechanisms by which ACA inhibits adipogenesis in 3T3-L1 preadipocytes.

METHODS
3T3-L1 preadipocytes were cultured in differentiation-inducing medium for 8 days in the presence or absence of ACA. Lipid accumulation was assessed via Oil Red O staining, while cell viability was evaluated using the MTT assay. Gene and protein expression levels of adipogenic and lipogenic markers were analyzed using real-time PCR and Western blotting.

RESULTS
ACA significantly reduced lipid accumulation in 3T3-L1 cells without notable cytotoxicity. It downregulated the expression of key fatty acid synthesis-related genes (*srebp1c*, *acc*, *fas*, *fabp4*) and adipogenic transcription factors (C/EBPβ, PPARγ, C/EBPα). Notably, ACA increased CREB phosphorylation at serine 133, a transcription factor for C/EBPβ, via a PKA-dependent pathway. Additionally, ACA enhanced AMPK phosphorylation, which inhibits CBP/p300, a co-activator of CREB, further suppressing adipogenic signaling.

CONCLUSIONS
These findings suggest that ACA exerts anti-adipogenic effects by modulating AMPK activation and suppressing CREB transcriptional activity. This study provides insights into the potential of ACA as a natural compound for obesity management.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_091

IMPACT OF MODERATE MATERNAL RIBOFLAVIN DEFICIENCY ON THE GROWTH AND DEVELOPMENT OF OFFSPRING RATS

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BACKGROUND AND OBJECTIVES
Riboflavin (vitamin B2) is crucial for energy metabolism and physiological processes. Pregnant women have a greater chance of being riboflavin deficient. However, there is limited research on how maternal riboflavin deficiency impacts offspring's growth, development, and anthropometric measurements. This study investigated the effects of maternal riboflavin (moderate) deficiency on offspring growth and development in a rat model.

METHODS
Two-month-old female Wistar (WNIN) rats were randomly divided into three groups: control (AIN-93G diet with 5 mg/kg of riboflavin), pair-fed, and riboflavin-deficient (0.5 mg/kg). After six weeks riboflavin deficiency was confirmed in the riboflavin deficient group and was allowed to mate with male littermates followed by pregnancy and lactation. The pups stayed with their mothers during lactation and received a diet similar to the mothers during weaning. The experiment included four groups of pups: control, pair-fed, deficient, and replenishment. Pups were maintained for 6 weeks before sacrificing them.

RESULTS
Female rats were fed a riboflavin-deficient diet, resulting in decreased body weight. While maternal fertility and pregnancy indices were unaffected, litter size was reduced in the deficient group of dams. Offspring of riboflavin-deficient dams exhibited delayed developmental milestones, including pinna unfolding, eye slit formation, and fur growth. Furthermore, they showed significantly lower anthropometric measurements of body weight, length, and abdominal circumference. Post-weaning mortality was higher in the deficient group, likely due to hypoglycemia. Replenishment with a riboflavin-sufficient diet partially reversed these adverse effects.

CONCLUSIONS
These findings emphasize the critical role of adequate maternal riboflavin intake for optimal fetal and postnatal growth and development in offspring.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_092

METHYL DEFICIENCY FUELS HEPATOCELLULAR CARCINOMA STEMNESS AND METABOLIC SHIFTS

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BACKGROUND AND OBJECTIVES
Hepatocellular carcinoma (HCC) is a common primary malignant cancer with a high mortality rate. Folate deficiency has been identified as a potential stress factor in the tumor microenvironment. However, the relationship between overall methyl nutrients and the malignant progression of HCC remains unclear. The objective was to examine how methyl nutrient deficiency reshapes the metabolic microenvironment and drives the progression of hepatocellular carcinoma.

METHODS
This study cultured human liver cancer cells (HepG2) in a low-methyl-nutrient microenvironment and subsequently performed intrahepatic xenotransplantation into C57BL/6 mice to establish a liver cancer animal model.

RESULTS
The RESULTS showed that folate and choline insufficiency, compared to the control group, significantly promoted *in vitro* HCC stemness, as indicated by (1) an increased wound healing area, (2) a 2-3-fold increase in tumor sphere volume and number, and (3) upregulation of cancer stem cell surface markers. Furthermore, the *in vivo* model revealed that methyl-nutrient insufficiency elevated serum LDH activity, caused disturbances in NADPH redox balance, and increased DNMT1 expression. Folate and choline deficiency exhibited Warburg effect characteristics and a decrease in methylation-related metabolites, such as acetylcholine and sarcosine.

CONCLUSIONS
In summary, methyl nutrient insufficiency drives the acquisition of HCC stem cell properties, reshapes the metabolic microenvironment, and exacerbates the risk of DNA hypomethylation.
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*Both A-Chun Hu and Kai-Wen Huang are corresponding authors.

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EPO8_093

ANTI-OBESITY EFFECTS OF CITRUS JABARA EXTRACT: MECHANISMS OF ADIPOCYTE DIFFERENTIATION INHIBITION AND LIPOLYSIS PROMOTION

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BACKGROUND AND OBJECTIVES
Obesity is a major risk factor for lifestyle-related diseases, including diabetes, hypertension, and dyslipidemia, which can progress to severe conditions such as myocardial infarction and stroke. With the global prevalence of obesity on the rise, effective prevention and intervention strategies are critically needed. *Citrus jabara*, a citrus fruit native to Kitayama Village, Wakayama Prefecture, Japan, has gained attention for its potential health benefits. Rich in vitamins A and C, carotene, and flavonoids, its peel contains narirutin, a flavonoid known for anti-allergic properties. However, its potential anti-obesity effects remain unexplored. This study aims to evaluate the anti-obesity effects of *jabara* extract and elucidate its underlying mechanisms.

METHODS
3T3-L1 preadipocytes were induced to differentiate into adipocytes over 8 days in the presence of various concentrations of *jabara* extract. Intracellular triglyceride accumulation was assessed via Oil Red O staining, while cell viability was determined using the MTT assay. Gene and protein expression levels of key factors in adipocyte differentiation and fatty acid synthesis were analyzed using real-time PCR and Western blotting.

RESULTS
Jabara extract did not affect cell viability but significantly reduced intracellular fat accumulation in a concentration-dependent manner, as demonstrated by Oil Red O staining. Stage-specific assays revealed that *jabara* extract inhibited fat accumulation during both early and late differentiation phases, suggesting effects on differentiation and lipolysis. Additionally, *jabara* extract reduced the expression of C/EBPα and PPARγ, critical transcriptional regulators of adipocyte differentiation, at both the gene and protein levels.

CONCLUSIONS
Jabara extract exhibits promising anti-obesity effects by inhibiting adipocyte differentiation and promoting lipolysis. These findings suggest that *jabara* may serve as a functional food ingredient for obesity prevention and management. Further studies are warranted to isolate and characterize its active components.

CONFLICTS OF INTERESTS
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EPO8_094

SEARCH FOR SIPHONAXANTHIN DEHYDROGENASE MODULATORS

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BACKGROUND AND OBJECTIVES

Siphonaxanthin is a carotenoid found in some edible green algae with potent anti-inflammatory effects. We previously showed that most of the orally administered siphonaxanthin is metabolized to three different dehydrometabolites, which exhibit stronger anti-inflammatory activities than siphonaxanthin itself. However, enzymes responsible for dehydrogenation of siphonaxanthin has not been identified. In addition, there is little information about the factors that regulate dehydrogenation of siphonaxanthin. In this study, we tried to elucidate them using cultured cell models.

METHODS

Cells were incubated with siphonaxanthin with or without various chemicals for 24 h. Accumulated dehydrometabolites of siphonaxanthin were extracted by Bligh-Dyer's method and quantified using HPLC-PDA.

RESULTS

We evaluated the dehydrogenase activity of human liver-derived HepG2, Huh7, and HepaRG cells, rat liver-derived McA-RH7777 cells, and human intestine-derived Caco-2 and HT29-MTX-E12 cells towards siphonaxanthin. HepG2 cells exhibited the stronger activity; hence, we used this cell line afterwards. We incubated HepG2 cells with siphonaxanthin in the presence or absence of various chemicals and found that itraconazole increased the dehydrogenase activity. On the other hand, α-naphthoflavone decreased the dehydrogenase activity of HepG2 cells. Since itraconazole and α-naphthoflavone are reported to activate and inhibit aryl-hydrocarbon receptor (AhR), respectively, we treated the cells with both itraconazole and α-naphthoflavone. The increase in the dehydrogenase activity by itraconazole was cancelled by α-naphthoflavone.

CONCLUSIONS

AhR activation would result in the increase the dehydrogenase activity towards siphonaxanthin. Food ingredients with AhR agonist activity could increase anti-inflammatory effects of siphonaxanthin via upregulation of siphonaxanthin dehydrogenase.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_095

THE EFFECT OF CHEDDAR CHEESE CONSUMPTION ON THE GUT MICROBIOME: EXPLORING THE ROLE OF THE DAIRY MATRIX

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BACKGROUND AND OBJECTIVES

Cheddar cheese is a nutritionally dense food matrix containing nutrients and bioactives with the potential to influence the gut microbiome (1). Food matrices (physical structures wherein nutrients are situated) influence nutrient absorption and digestibility (2). Thus, the dairy matrix may affect gut microbial responses to dairy foods. This research aims to identify gut microbial responses to cheddar cheese consumption, considering aspects of the dairy matrix.

METHODS

Secondary analysis was conducted on a subset (n=69) of data from a 6-week parallel dietary intervention study (3). Interventions were: (A) 120g unmelted cheddar cheese (n=30); (B) 120g melted cheddar cheese (n=18); (C) butter (49g), calcium caseinate powder (30g), and Ca supplement (500mg) (n=21). Anthropometry, dietary intake data and fecal samples were collected at week 0 and 6 (W0, W6). Fecal samples underwent 16S rRNA gene sequencing (Illumina NextSeq2000), followed by bioinformatic and statistical analysis determining the impact of the intervention on the gut microbiome. This involved differential abundance testing (ALDEx2 with Wilcoxon), alpha diversity (Shannon, Simpson with Wilcoxon) and beta diversity analysis (PCoA on Bray-Curtis dissimilarity (BC) with PERMANOVA).

RESULTS

At baseline, 52% were female, mean age was 58.2±5.4 years and mean BMI was 28.3±3.4kg/m², with no significant differences between groups or timepoints. Following 16S rRNA sequencing, 12098 unique bacterial taxa were identified across the total cohort. Under a false discovery rate cutoff of 0.1, Dorea ($W=0.568$, $p=0.079$) and Erysipelotrichaceae UCG-003 ($W=0.887$, $p=0.097$) were significantly increased at W6 in the unmelted cheese group. Bacteroides was differentially abundant in the unmelted group, relative to the melted group at W6 ($W=0.587$, $p=0.034$). Bacterial alpha diversity (Shannon, Simpson) significantly increased from W0 to W6 in the unmelted group ($p<0.05$). Beta diversity (PERMANOVA on BC) showed a significant group effect considering all groups and timepoints ($F=1.505$, $p<0.01$), although there was no significant effect considering W6 only.

CONCLUSIONS

The unmelted cheese group showed an increase in overall gut bacterial diversity, with further increases seen in the fermenting bacteria Dorea and Erysipelotrichaceae UCG-003. Unmelted cheddar cheese may positively modulate the gut microbiome by increasing species richness and evenness, potentially conferring benefits to the host. Heating and altering physical cheese structure disrupts the dairy matrix, potentially influencing downstream gut-nutrient interactions and subsequent gut microbial response. This effect warrants further exploration.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_099

A NOVEL POSTBIOTIC FORM OF LACTIPLANTIBACILLUS PLANTARUM AMELIORATES EXCESSIVE FAT ACCUMULATION IN OBESE MICE

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BACKGROUND AND OBJECTIVES
Obesity is a multifactorial disease characterized by an excessive accumulation of adipose tissue. This excess of adiposity contributes to the development of other obesity-related metabolic disturbances, such as chronic inflammation and insulin resistance. Different strategies can contribute to reduce excess adiposity, including the improvement of the microbiota–gut–adipose axis. This is the case of new probiotics with anti-obesity properties (i.e, some strains of *Lactiplantibacillus plantarum*). However, postbiotics, defined as bacteria-free extracts and non-viable microorganisms, may be even more effective to the host and are being preferred as potential therapeutic tools. Here, we evaluate the fat-reducing activity of a novel postbiotic form of a strain of *Lactiplantibacillus plantarum* in a diet-induced obesity mouse model

METHODS
22 male C56BL/6 mice were fed a high-fat-high sugar (HFS) diet and 10% of fructose in the water to induce obesity, and were divided into two groups: HFS group (n=11, HFS diet without supplement) and POSTBIOTIC group (n=11, HFS diet supplemented with 2 x 10E9 *Lactiplantibacillus plantarum* dead cells/day during 10 weeks). An additional group of mice (CNT group, n=8) was fed a rodent maintenance diet (14% protein) during the whole experiment, as non-obese control mice. Body composition, body weight, adiposity and biochemical parameters were analysed in all groups. Finally, microbiota was analysed by 16S rRNA sequencing in the faecal samples of the three groups

RESULTS
All HFS-fed mice exhibited a significant increase in body weight and fat mass in comparison with the control diet-fed animals. However, despite no differences in total body weight, mice supplemented with the postbiotic form of *L. plantarum* showed a significant reduction in the proportion of retroperitoneal, mesenteric and subcutaneous fat depots. Metagenomic analyses revealed differences in the gut microbiota of treated and untreated-HFS groups at family, genus and species level

CONCLUSIONS
Our RESULTS suggest that the novel postbiotic form of *Lactiplantibacillus plantarum* has potential activity against excessive fat accumulation and can target the obesity-related dysbiosis, emphasizing the positive impacts of postbiotics on obesity and its comorbidities

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_100

KAEMPFEROL-3-O-RUTINOSIDE ISOLATED FROM GYNURA BICOLOR (국문명: 금시초): ANTIOXIDANT AND FUNCTIONAL TEA DEVELOPMENT

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BACKGROUND AND OBJECTIVES
Kaempferol-3-O-rutinoside (K-3-O) is a flavonoid with strong antioxidant activity, making it a promising compound for functional foods and materials. *Gynura bicolor* has been traditionally consumed in Southeast Asia, particularly in Taiwan, China, and Japan, and is known for its bioactive compounds such as flavonoids and anthocyanins. These properties suggest its potential as a functional ingredient. However, research on *Gynura bicolor* cultivated in Korea is limited, highlighting the need for systematic studies. This study aims to isolate, identify, and quantify K-3-O from the BuOH fraction of *Gynura bicolor*, establish data on its antioxidant activity, and assess its potential as a functional material.

METHODS
The extract of *Gynura bicolor* was fractionated stepwise to obtain the BuOH fraction, from which K-3-O was isolated using open column chromatography. Structural validation was performed via NMR spectroscopy with methanol-d_4 as the solvent, confirming the 1H and 13C signals characteristic of the kaempferol skeleton and rutinoside moiety. LC-MS analysis used multiple reaction monitoring (MRM) mode to track ion transitions from m/z 594.39 to 286.22. A calibration curve using a Sigma-Aldrich standard (10–500 ppb) ensured accurate detection.

RESULTS
K-3-O was identified in LC-MS analysis with a retention time (RT) of 2.38 minutes, and its concentration in the BuOH fraction was 217.9 ppb. NMR analysis confirmed its structure through 1H signals (6.4–7.8 ppm) and 13C signals (60–105 ppm). The BuOH fraction showed DPPH radical scavenging activity of 82.3%, surpassing the EtOAc fraction (75.2%). LC-MS analysis established detection (LOD, 10 ppb) and quantification limits (LOQ, 30 ppb) for K-3-O, with a high calibration curve linearity ($R^2 = 0.999827$).

CONCLUSIONS
This study successfully isolated, identified, and quantified Kaempferol-3-O-rutinoside (K-3-O) from the BuOH fraction of *Gynura bicolor* cultivated in Korea. The findings confirm the potential of *Gynura bicolor* as a functional material with antioxidant properties. Future research will focus on K-3-O's antioxidant mechanisms and effects on reactive oxygen species (ROS) using *Caenorhabditis elegans* as a model.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_101

THE EFFECT OF A SLUSH PUPPY-GLYCEROL COMBINATION ON THERMOREGULATION AND FLUID BALANCE DURING A MILITARILY RELEVANT PHYSICAL EXERCISE

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BACKGROUND AND OBJECTIVES
Military personnel often face high levels of heat stress due to heavy gear and intense activity in combination with high ambient temperatures, increasing the risk of heat illness. Nutritional mitigating strategies can enable soldiers to work effectively in the heat. It is known that a slush puppy drink can lower core temperature, while adding glycerol can help to retain fluid (Lee, Kenefick & Cheuvront, 2015, Goulet et al., 2018). This study aims to determine if the combined ingestion of a glycerol-slush drink can reduce thermal strain and improve fluid balance, potentially enhancing safety and performance in hot environments in a military relevant protocol.

METHODS
In this crossover study with three conditions, during each visit 12 healthy male participants will perform a 50-minute march, followed by a 10-minute break, conducted in a climate chamber set to 33°C with 50% relative humidity. The three conditions are: an isotonic sports drink at 33°C, a slush puppy drink at 0°C, and a combined slush puppy glycerol drink at 0°C. Participants will consume one of the three test drinks 30 minutes before starting each march. During the march, several continuous measurements will be performed, including heart rate and core and skin temperature. In addition, blood plasma volume, total urine production, total sweat loss, and local sweat production and concentration will be measured at multiple times. Also, subjective responses, such as perceived exertion and thermal sensation will be collected. A two-way repeated measures ANOVA will be used to compare the effects of the drink conditions.

RESULTS
It is anticipated that the slush puppy drink will lower core temperature, reduce sweat rate, decrease thermal sensation, and improve thermal comfort compared to the isotonic drink alone. Glycerol is expected to enhance fluid retention, resulting in increased blood plasma volume and reduced urine output. The combination of slush and glycerol is anticipated to outperform the other conditions, specifically concerning core temperature and fluid balance.

CONCLUSIONS
This study is expected to offer valuable insights into the effects of a combined slush puppy-glycerol drink on thermoregulation and fluid balance during a military relevant task. The RESULTS of this study can contribute to heat mitigation strategies for military personnel, with the combined approach of slush and glycerol providing a practical solution for managing both thermal load and dehydration for performing in hot conditions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_102

FACTORS INFLUENCING THE IMPLEMENTATION OF THE NUTRITION COMPACT AGREEMENT AMONG MEMBERS OF THE MULTISECTORAL STEERING COMMITTEE ON NUTRITION IN TANZANIA

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BACKGROUND AND OBJECTIVES
Malnutrition remains a pressing challenge in Tanzania, necessitating multisectoral efforts to address its complex causes. The Nutrition Compact Agreement was introduced to enhance accountability and foster collaboration among stakeholders. This study explored the factors influencing its implementation, focusing on facilitating factors, challenges, and perceptions of its complexity.

METHODS
A qualitative approach was employed, utilizing 20 key informant interviews with members of the Multisectoral Steering Committee on Nutrition from different Nutrition sensitive departments. Data were thematically analysed to identify key enablers, challenges, and perceptions related to the Nutrition compact agreement.

RESULTS
Facilitating Factors: Government commitment, effective coordination mechanisms, and active participation of NGOs were crucial. Availability of signed agreements, budget allocations, and availability of guidelines such as School feeding guidelines and Village Health and Nutrition(VHND) guideline further enhanced implementation of Nutrition Compact in the Region.
Challenges: Limited financial resources, shortages of skilled personnel, outdated policies, and inadequate tools hindered progress. Poor supervision and gaps in training also constrained effective implementation.
Perceptions of Complexity: Stakeholders found the compact well-structured, with clearly defined roles, but emphasized the need for continuous capacity-building due to staff turnover.

CONCLUSIONS
The Nutrition Compact Agreement is a promising framework for addressing malnutrition through multisectoral collaboration. However, addressing resource gaps, updating policies, and strengthening capacity-building are critical for sustained success. These findings underscore the need for coordinated, resource-driven strategies to achieve nutrition goals.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_103

SOCIODEMOGRAPHIC, NUTRITIONAL, AND CLINICAL PROFILE OF CHILDHOOD STUNTING IN SOUTHERN PHILIPPINES: DATA FROM MOTHER-CHILD DYADS

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BACKGROUND AND OBJECTIVES
In the Philippines, one in every four children under five years old is stunted (1), with the highest prevalence observed in the southern region, where up to 45% of children under five are affected (2). This study aimed to determine the sociodemographic, nutritional, and health-related profiles of stunted children in southern Philippines by analyzing mother-child dyads.

METHODS
A case-control study was conducted among children under five years old in selected regions of southern Philippines. Cases included stunted children and their mothers, while controls were non-stunted children and their mothers matched for age, sex and residence. Physical examinations and anthropometric measurements were performed, and mothers were interviewed regarding sociodemographic factors and health practices. Data were analyzed using Logistic Regression.

RESULTS
A total of 408 mother-child dyads were included, comprising 203 stunted children and their mothers, and 205 non-stunted counterparts. A majority of stunted children were aged 0–5 months (112; 56.6%). The male-to-female ratio was similar across groups. Most stunted children were also underweight (197; 96.1%), a finding mirrored among non-stunted children (196; 96.6%). Both groups predominantly completed the primary series of immunizations. Maternal factors significantly associated with childhood stunting included being underweight, married, religion, residing in rural areas, using open-pit toilets, and reliance on well water.

CONCLUSIONS
Childhood stunting in southern Philippines is influenced by a combination of sociodemographic, nutritional, and environmental factors. These findings highlight the need for integrated interventions focusing on maternal nutrition, access to safe water, and improved sanitation to reduce stunting prevalence in this region. Addressing these determinants is crucial to improve child growth and development outcomes.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_107

COVERAGE SURVEY OF INTEGRATED MANAGEMENT OF ACUTE MALNUTRITION PROGRAM USING SLEAC METHODOLOGY

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BACKGROUND AND OBJECTIVES

Acute malnutrition, or wasting, is a leading cause of child morbidity and mortality. To address this, Nepal's government implements the Integrated Management of Acute Malnutrition (IMAM) program across all 77 districts. Despite these efforts, 8% of children aged 6–59 months remain wasted, with some provinces exceeding the WHO emergency threshold. This survey aimed to evaluate IMAM program coverage in three districts and identify barriers and facilitators to improving access and coverage nationwide.

METHODS

This coverage survey utilized the Simplified Lot Quality Assurance Sampling Evaluation of Access and Coverage (SLEAC) methodology across three districts: Rautahat (Madhesh Province), Dolakha (Bagmati Province), and Mugu (Karnali Province) representing the three ecological regions of the nation. Districts were selected based on screening, admission, cured, and defaulter rates for wasting. Using two-stage cluster sampling, trained enumerators visited households with children aged 6–59 months from August to October 2024. Mid-upper arm circumference (MUAC) measurements classified children as SAM or normal per WHO cut-offs, while caregivers were interviewed to identify barriers and boosters to program utilization.

RESULTS

A total of 14,175 children were screened using MUAC across Rautahat (6,347), Dolakha (4,471), and Mugu (3,357). IMAM program coverage for SAM treatment was classified as "low" (below 20%) in Rautahat and Dolakha but "high" (above 50%) in Mugu. Barriers included caregiver unawareness of malnutrition, the IMAM program, and treatment options, lack of accompanying persons, family illness, low household decision-making power for women, therapeutic food shortages, skepticism about program effectiveness, and insufficient information. Boosters included malnutrition diagnosis by health personnel and caregiver satisfaction with services.

CONCLUSIONS

Improvements and adaptations in the IMAM program are necessary to enhance coverage across all districts. Key to this effort will be increasing awareness of malnutrition and the availability of the program, as well as enhancing the quality of IMAM treatment at the health facility level. Proper monitoring of the implementation and well managed supply chain can help enhance coverage and access of the program.

CONFLICTS OF INTERESTS

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EPO8_108

THE AVAILABILITY, ACCESSIBILITY AND CONSISTENCY OF ALLERGEN INFORMATION OF FOODSTUFFS ACROSS ONLINE RESTAURANT AND DELIVERY APPLICATION PLATFORMS USED IN SOUTH AFRICA.

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BACKGROUND AND OBJECTIVES
The acceleration of digitalization has led to significant growth in online retail. Consumers with food allergies remain at risk due to the absence of standardized allergen labelling on online platforms, as current legislation and practices are inadequate for the digital food marketplace. This study aimed to investigate the availability and accessibility of allergen information on online platforms.

METHODS
Observational checklists were used to collect data for two online platforms: restaurants and delivery applications. Data collection took place over two weeks, in March 2024 by standardised researchers. Descriptive statistics, Pearson Chi-Squared, and Fisher Exact tests were used for data analysis.

RESULTS
Among the 17 applications, 88.2% (n=15) had a search bar. Only 23.5% (n=4) included an interactive communication feature, and 17.6% (n=3) had an allergen filter. Applications were significantly more likely to feature a search bar function (p=0.05). Only 50% (n=8) of menu item platforms and 55.6% (n=5) of grocery item applications displayed ingredients. Allergen presence was declared for 30.2% (n=86) of all products (n=285). Information was available only in English. For products containing allergen information 59.3% (n=51) displayed an allergen heading. The number of clicks to reach allergen information was 2.5. Customization options were available for 78.4% (n=80) of meal items. Only 10% (n=8) offered allergen-friendly alternatives, 46.3% (n=37) allowed item removal, and 67.5% (n=54) accepted special instructions.

CONCLUSIONS
There is significant room for improvement in enhancing consumers with food allergies' ability to make informed online food choices. It is recommended that legislation on food labelling be extended to online platforms, ensuring a standardized format for allergen information to protect consumers with food allergies.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_109

DEVELOPING A NATIONAL FOOD COMPOSITION DATABASE: THE PROCESS OF FOOD SELECTION

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BACKGROUND AND OBJECTIVES
The absence of an updated and methodologically sound food composition database represents a significant limitation for health professionals, researchers, and institutions in our country. Currently, foreign food composition tables are used, which do not accurately reflect the characteristics of foods consumed at the national level. The objective of this study is to document the process of prioritizing nutrients and identifying priority foods in our country, which will be analyzed to finalize a national food composition database.

METHODS
A team of national experts in the field secured funding to implement a project focused on a limited number of foods. Following international guidelines adapted to the national context from Infoods-FAO, the project began with the selection of priority nutrients and advanced towards identifying foods for sampling. This selection was based on data analysis from the latest household food consumption survey, given the lack of information on food consumption frequency among adults in our country.

RESULTS
Despite economic and material constraints, significant progress was made in selecting foods to be analyzed at the laboratory level.

CONCLUSIONS
This project not only faces technical and logistical challenges but also presents an opportunity to strengthen national capacities and establish strategic partnerships. In this way, the project lays the foundation for the development of a national food composition database to support decision-making in health, nutrition, and food research.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_110

MOLECULAR FOOTPRINT & METABOLIC ROLE OF ADIPOSE TISSUE-DERIVED EXTRACELLULAR VESICLES IN EARLY-STAGE OBESITY AS POTENTIAL BIOMARKERS OF INSULIN RESISTANCE

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BACKGROUND AND OBJECTIVES
Extracellular Vesicles (EVs) are nanoparticles relased and used by cells for intercellular communication. In this context, EVs and their content could serve as potential biomarkers of insulin resistance (IR). Obesity is a risk factor affecting adipose tissue (AT) function and, consequently, insulin sensitivity. The aim was to analyze the metabolic role of the EV content of AT in the early stages of obesity.

METHODS
In the first step, a rat model of diet-induced obesity was established for 10 weeks. In a second step, the proteome of adipose tissue-derived EVs (ADEVs) was analyzed to determine a molecular fingerprint thatdistinguishes the obesity/IR group.

RESULTS
In the first phase, the obese group showed higher levels of both the triacylglyceride-glucose index (T&G) and the triacylglyceride/HDL-c ratio, both used to estimate IR, compared to the control group. For ADEVs, size was related to T&G ($r=0.63$; $p<0.02$) and with multiple linear regression models, we were able to predict the T&G value from the diameter of the ADEVs ($p<0.05$). In the second phase, through label-free quantitative proteomic analysis, potential biomarkers of proteins involved in metabolic processes of the insulin signaling pathway, regulation of triacylglyceride synthesis in adipocytes, and higher abundance of proteins involved in glycolysis were found in the control group.On the other hand,in the obesity/IR group, we found molecular fingerprints of proteins involved in catabolic processes, increased secretion of EVs, and proteins involved in the development of IR. In addition, a first exploratory phosphoproteomic approach found phosphoproteins involved in the regulation of inflammation, oxidative stress, and the assembly of proteins related to the insulin signaling pathway. However, only the obese/IR group presented GLUT 4 transporter protein and protein phosphatase 1 as characteristic molecular signatures.

CONCLUSIONS
Our RESULTS suggest that the lager the size of the ADEV, the higher the degree of systemic IR as assessed by T&G. Together with size, the molecular content of proteins and phosphoproteins of the ADEV could be used to identify early IR and monitor it in people who consume high-fat diets, or increase their waist circumference as consequence of weight gain.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_113

BALANCING NUTRITION AND ACCEPTABILITY: ENRICHED KUNUN ZAKI FORMULATIONS FOR MALNUTRITION INTERVENTION

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BACKGROUND AND OBJECTIVES
Abstract
Kunun zaki is a traditional, non-alcoholic beverage in Northern Nigeria, typically made from fermented millet. This study aimed to enhance the nutritional profile of *kunun zaki* by incorporating whole millet, sprouted millet and sesame seeds, targeting increased protein, vitamins, essential fatty acids and minerals beneficial for maternal nutrition.

METHODS
Five formulations with varying ingredients' proportions were developed and analysed for proximate composition, vitamin and mineral content, amino acid profile and anti-nutritional factors. Sensory evaluation was also conducted with 20 panellists assessing taste, colour, aroma, sweetness, appearance, solubility and general acceptability on a 9-point hedonic scale.

RESULTS
The enriched formulations showed significant increase ($P<0.05$) in protein, essential fatty acids, B vitamins, and minerals like calcium, iron, and zinc. Additionally, fermentation and sprouting reduced anti-nutritional factors such as phytates and tannins, enhancing mineral bioavailability. However, sensory evaluation reveals that nutritionally inferior but traditional formulation (containing 100% unsprouted millet) are prepared in taste, aroma and overall acceptability over the innovative, nutritionally-superior formulations (containing varying proportions of sprouted millet and sesame seeds) among the panellists, probably due to latter stronger and less familiar flavour profiles. Incorporating whole and sprouted millet with sesame in the beverage significantly improves its nutritional quality, supporting its potential as a functional beverage with health benefits, particularly for maternal nutrition. However, the acceptability of the formulations toward the consumers need to be re-evaluated due to the poor acceptability of nutrient-dense formulations. This study highlights the potential of nutrient-enriched *kunun zaki* as a functional beverage for maternal nutrition, emphasizing the need to optimize sensory attributes to balance nutritional enhancement with consumer preferences.

CONCLUSIONS
The findings provide a foundation for developing culturally relevant, nutrient-rich foods to address malnutrition in at-risk populations.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_114

DEVELOPMENT AND VALIDATION OF A KUWAITI FOOD FREQUENCY QUESTIONNAIRE FOR DIETARY FIBRE INTAKE IN OLDER ADULTS

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BACKGROUND AND OBJECTIVES
Dietary fibre (DF) intake is little understood in older adults. Very few dietary studies include those over 60y and, even if included, they are not separated from other adults. Low intake may be related to increased constipation but to establish DF intake validated assessment tools based on locally relevant foods are needed. This study developed and validated a Kuwaiti- DF specific FFQ (KWFFQ-DF) for those over 60y.

METHODS
Sixty participants (>60y) (healthy and those with diabetes and/or hypertension) were recruited from ten geriatric clinics in six governorates of Kuwait (June to September 2022). The KWFFQ-DF was developed by adapting and updating existing validated FFQs for Arab populations(1-6). Pre-testing reduced a long list of 190 items from eleven food groups to seven fibre-rich groups. The KWFFQ-DF was validated against 24-hour multiple-pass recall (24H-MPR) and 3-day weighed diaries (3DWD). Methods were compared after testing for Shapiro-Wilk normality. Pearson correlation, Bland-Altman plots, and Weighted Kappa analysis were applied.

RESULTS
Participants (44 females, 16 males) aged 61-85y had a mean BMI of 30 kg/m2 (range: 21-50). The average total dietary fibre (TDF) intake was 23.5g/day (6g soluble dietary fibre [SDF], 17.5g insoluble dietary fibre [IDF]) in the KWFFQ-DF validation, 23.4g/day (6g SDF, 18g IDF) in 3DWD, and 23.1g/day (6g SDF, 17g IDF) in 24H-MPR. Common high-fibre food sources included fresh dates palm, watermelon, local breads, vegetables, chickpeas, and various types of wheat and rice-based dishes. There was a similar range of TDF intake (11.0-34.0g/day) SD 5.79g in KWFFQ-DF, 6.08g in 3DWD, and 6.54g in 24H-MPR. KWFFQ-DF intakes correlated well with 3DWD ($r=0.871$, $p < 0.01$) and 24H-MPR ($r=0.851$, $p < 0.01$). Weighted Kappa indicated moderate agreement (0.66 for 3DWD, 0.63 for 24H-MPR). Sensitivity to DF intake ≥25 g/day was 67%, with a specificity of 93%.

CONCLUSIONS
The KWFFQ-DF is a valid tool for assessing DF intake in older Kuwaiti adults and supports further development of nutrient-specific FFQs for the region.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_115

IMPROVING THE SCHOOL FOOD ENVIRONMENT IN SOUTH AFRICA: REGULATION AND MONITORING OF FOOD AND BEVERAGE SALES AT SCHOOL TUCKSHOPS

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BACKGROUND AND OBJECTIVES
As part of UNICEF's initiative to improve the school food environment (SFE) in South Africa and promote better health outcomes for learners, seven multi-stakeholder co-developed interventions were piloted in six public schools for the purpose of scaling up nationwide. The SFE in South Africa primarily consists of meal provisioning through the National School Nutrition Programme (NSNP), the sale of food and beverages at tuckshops and external vendors, and packed lunches brought by learners. The first intervention focused on regulating and monitoring food and beverage sales at school tuckshops, with the primary objective of introducing healthier options while addressing challenges to their adoption and long-term sustainability.

METHODS
A participatory approach was adopted, with each school co-developing a list of healthy food items to be sold at tuckshops in collaboration with the research team. Schools implemented one of two strategies depending on tuckshop ownership: a phased introduction of healthy foods or a complete transition to a healthy tuckshop with the sale of no competitive foods. Accountability and communication plans were co-developed, and tuckshop vendors received training alongside support for procuring healthy items. The intervention, rolled out over three months, was supported by promotional materials and choice architecture tools. Monitoring and evaluation included sales data and feedback from all stakeholders.

RESULTS
Two schools successfully implemented a full-on healthy tuckshop, while four schools with contracted external vendors adopted a phased approach. Key barriers included the presence of competitive foods, resistance from tuckshop owners, limited availability of affordable healthy items, competition from external vendors, and challenges associated with large learner populations. Facilitators included strong support from school leadership, the gradual introduction of healthy items, and the popularity of affordable, healthy snacks.

CONCLUSIONS
The pilot highlighted critical considerations for scaling the intervention, such as the dependency of schools on tuckshop revenue, the sustainability of healthy tuckshops, affordability and access to healthy items, and the need for partnerships with reliable suppliers. To address these challenges, a National Healthy Tuckshop Policy is proposed with clear nutritional standards. Further, integration with health-promoting school policy, robust monitoring and accountability mechanisms, and capacity building through training for tuckshop operators and educational campaigns for learners and parents are recommended.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_118

NEUROPROTECTIVE EFFECTS OF STRAWBERRY LEAF EXTRACT ON PARKINSON'S DISEASE: MECHANISMS AND POTENTIAL APPLICATIONS

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BACKGROUND AND OBJECTIVES
Parkinson's disease (PD) is a neurodegenerative disorder characterized by the degeneration of dopamine-producing neurons in the substantia nigra, leading to motor impairments and non-motor symptoms. With the increasing incidence of PD due to global population aging, the number of patients is expected to rise. Currently, no established treatments exist to halt the progression of PD, and available therapies focus solely on symptom management. Therefore, there is a pressing need to develop fundamental treatments and preventive measures for PD. Strawberry (*Fragaria x ananassa* Duch.), a perennial plant of the Rosaceae family, contains leaves rich in polyphenols, surpassing those found in the fruit. Strawberry leaves exhibit physiological effects such as antioxidant activity, but they are largely treated as agricultural waste. Exploring their potential application may contribute to waste utilization and health advancements. This study aims to investigate the preventive effects of strawberry leaf extract (SLE) on PD.

METHODS
Human neuroblastoma SH-SY5Y cells, widely used in PD-related studies, were cultured in Dulbecco's Modified Eagle's Medium with 10% fetal bovine serum. Neuronal damage was induced using rotenone, a mitochondrial electron transport chain inhibitor. SLE was added concurrently with rotenone at the start of the main culture. Analyses included cell viability, intracellular reactive oxygen species (ROS) production, nuclear Nrf2 expression, and apoptotic markers. Gene expression levels were assessed using real-time PCR.

RESULTS
SLE restored cell viability reduced by rotenone. Elevated ROS levels induced by rotenone were decreased to control levels following SLE treatment. SLE promoted Nrf2 translocation into the nucleus, an effect inhibited by an AMPK inhibitor. Furthermore, SLE significantly increased the expression of p62, which facilitates Nrf2 nuclear translocation. Additionally, SLE reduced PINK1 expression levels elevated by rotenone and suppressed apoptotic cell death

CONCLUSIONS
These findings suggest that strawberry leaf extract exerts neuroprotective effects by reducing ROS production and promoting Nrf2 nuclear translocation via the AMPK signaling pathway. The use of strawberry leaf extract offers potential as both a preventive measure for PD and an innovative approach to agricultural waste utilization.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_119

ANTI-OBESITY EFFECTS OF STRAWBERRY LEAF EXTRACT: MECHANISTIC INSIGHTS AND POTENTIAL FOR SUSTAINABLE UTILIZATION

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BACKGROUND AND OBJECTIVES
Diabetes and dyslipidemia, both of which are lifestyle-related diseases, are closely associated with obesity and significantly increase the risk of mortality from conditions such as myocardial infarction. Dietary interventions play a critical role in their prevention. Recently, the potential of food functionality in obesity prevention has garnered attention, leading to advancements in the development of functional foods. Strawberry (*Fragaria x ananassa* Duch.), a perennial herb of the Rosaceae family, has been reported in previous studies to possess anti-inflammatory and antioxidant properties in its leaves. However, the anti-obesity effects of strawberry leaf extract (SLE) remain unclear. This study aims to elucidate the anti-obesity effects of SLE and its underlying mechanisms. Additionally, by exploring the potential utilization of strawberry leaves -currently discarded in large quantities as industrial waste- this research contributes to sustainable societal practices.

METHODS
Using 3T3-L1 preadipocytes, the effects of SLE on cell viability were evaluated using the MTT assay. Adipocytes were cultured in differentiation-inducing medium for 8 days, and intracellular fat accumulation was assessed via Oil Red O staining. The activity of glycerol-3-phosphate dehydrogenase (GPDH), a rate-limiting enzyme in triglyceride synthesis, was measured through absorbance changes. Furthermore, the expression levels of genes and proteins involved in adipocyte differentiation and fatty acid synthesis were analyzed by real-time PCR and Western blotting, respectively.

RESULTS
SLE did not affect cell viability but significantly reduced fat accumulation and GPDH activity. The expression of *C/EBPα* and *PPARγ*, key regulators of adipocyte differentiation, was suppressed at both the gene and protein levels. Additionally, the expression of *SREBP-1c* and *ACC1*, involved in fatty acid synthesis, was significantly decreased. Furthermore, SLE was found to promote AMPK phosphorylation, a key regulator of energy metabolism, while inhibiting ERK phosphorylation, which is closely linked to insulin signaling.

CONCLUSIONS
These findings suggest that SLE suppresses fatty acid synthesis by promoting AMPK phosphorylation and exerts anti-obesity effects by inhibiting ERK phosphorylation. The potential use of SLE not only offers a novel approach to obesity management but also aligns with efforts toward sustainable resource utilization.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_120

STAKEHOLDER PERCEPTIONS OF THE SOUTH AFRICAN SCHOOL FOOD ENVIRONMENT: BASELINE FINDINGS

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BACKGROUND AND OBJECTIVES
South Africa is experiencing a growing prevalence of overweight and obesity, affecting young children and adolescents. Agents of change play a crucial role in improving the school food environment (SFE), directly or indirectly, and they wield the ability to promote behavioural change, improving health outcomes. This study set out to determine stakeholders' perceptions of the South African public SFE to gain a deeper understanding of their perspectives and identify barriers and facilitators to fostering a healthy SFE.

METHODS
Six public schools representing a combination of an urban and rural mix, including three primary and three secondary schools, were preselected by the Department of Basic Education as pilot schools to improve the SFE in South Africa. Data were collected through focus group discussions (FGDs) with learners, parents, teachers, volunteer food handlers, and school governing bodies, alongside key informant interviews with principals, formal food vendors, and informal food vendors to determine stakeholders' perceptions and capacity to improve the SFE. Qualitative data was analysed through thematic analysis.

RESULTS
Thirty FGDs were done collectively, six for each stakeholder and 18 key informant interviews were conducted among the principals, and formal and informal vendors, six for each stakeholder. The FGDs and key informant interviews yielded several themes, including policy implementation gap and governance, barriers and facilitators of accessing healthy foods at schools, exposure to marketing and advertising, individual-level considerations to food choice, and operational challenges in food provisioning.

CONCLUSIONS
The barriers and facilitators identified in the themes and sub-themes through this multi-stakeholder approach in SFE serve as a valuable framework for the development of intervention strategies for establishing a sustainable, healthy SFE in South Africa.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_121

ERO1A DNA METHYLATION MEDIATES THE TRANSGENERATIONAL EFFECTS OF ZINC, SELENIUM AND CHROMIUM ON ER STRESS AND GLUCOSE HOMEOSTASIS IN FEMALE OFFSPRING OF GESTATIONAL DIABETES RATS

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BACKGROUND AND OBJECTIVES
Zinc, selenium and chromium supplementation improved hepatic endoplasmic reticulum (ER) stress in GDM rats and had beneficial transgenerational effects on glucose homeostasis in female offspring. However, whether the epigenetic molecular mechanism is involved in the transgenerational effects of zinc, selenium and chromium is relatively unknown. Therefore, this study aims to explore the potential epigenetic mechanisms involved.

METHODS
Female Sprague Dawley rats were fed with either an HFS (to induce the GDM model) or LF diet for three consecutive generations (F0, F1, and F2), and supplemented with zinc (10 mg/kg.BW), selenium (20 μg/kg.BW) chromium (20 μg/kg.BW) daily by gavage. Global DNA methylation levels and methylation status of promoter regions of ER stress-related genes were investigated in the liver of F1 and F2 female neonates. GDM caused glucose intolerance, insulin resistance, hepatic ER stress, and increased global DNA methylation in F1 and F2 female neonates.

RESULTS
GDM caused glucose intolerance, insulin resistance, hepatic ER stress, and increased global DNA methylation in F1 and F2 female neonates. Pyrosequencing identified a hypermethylated promoter region in ERO1α that regulated ER stress, which was associated with reduced gene expression and activation of ER stress. Efficient zinc, selenium and chromium supplementation with GDM conferred significant protection against the hypermethylation status of the ERO1α gene promoter region in F1 and F2 female neonates, thus alleviating the ER stress and insulin resistance.

CONCLUSIONS
GDM caused glucose intolerance, insulin resistance, hepatic ER stress, and increased global DNA methylation in F1 and F2 female neonates. Pyrosequencing identified a hypermethylated promoter region in ERO1α that regulated ER stress, which was associated with reduced gene expression and activation of ER stress. Efficient zinc, selenium and chromium supplementation with GDM conferred significant protection against the hypermethylation status of the ERO1α gene promoter region in F1 and F2 female neonates, thus alleviating the ER stress and insulin resistance.

CONFLICTS OF INTERESTS
The authors declare that they have no conflicts of interest with the contents of this article.

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EPO8_122

ROLE OF PHOSPHATE HOMEOSTASIS IN LOCAL ENERGY METABOLISM MAINTAINED BY ENPP1 ACTIVITY

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BACKGROUND AND OBJECTIVES
Phosphate insufficiency affect bone development due to compensating mechanisms in homeostasis. As locomotor organ, muscle function alters correspondingly to bone tissue, however, the direct effects of phosphate homeostasis on muscle function have not yet been revealed. In animal study, administration of high phosphate diet impaired energy metabolism and caused the reduction in muscle functions that was accompanied by hyperphosphatemia. We therefore investigate the role of phosphate homeostasis on muscle function by in vitro study with muscle cells.

METHODS
C2C12 muscle cells were cultured, and cells maturations were initiated. Alteration of phosphate homeostasis was recreated in culture medium containing different levels of phosphate. In addition, since active form of vitamin D [1,25(OH)2D3] and cell surface located enzyme, ectonucleotide pyrophosphatase/phosphodiesterase 1 (Enpp1) play an important role in phosphate metabolism in the body, we assessed the role of these factors on muscle cells function with several phosphate conditions in culture. To this aim, concentration of 1,25(OH)2D and Enpp1 specific inhibitor were adjusted to 10-9M to 10-11M and 10-5M to 10-6 M respectively in medium and supplied to culture for 48 hours. At the end, medium and cultured cells were separatory collected for protein expression and glucose assay.

RESULTS
As a result, the protein levels of Glucose transporter and ATP synthase revealed with western blot analysis was decreased by blockade of ENPP1 activity in cultured cells. These RESULTS suggested that the altering phosphate dynamics depend on Enpp1 function at cell membrane affect glucose-ATP metabolism. Next, the amount of bone marrow fat tissue was assessed in femur of Enpp1 asj mice as a parameters of nutrition sufficiency. These mice show low blood phosphate from a young age; thus, we use these mice to investigate the effect of organ phosphate metabolism. The values of the amount of fat tissue in bone marrow cavity were higher than those of WT mice.

CONCLUSIONS
Taken together, the phosphate dynamics directly changed local energy metabolism in muscle cells. Phosphate sufficiency is considered as an important factor to maintain utilization of nutrition based on energy metabolism.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_123

STUDY ON THE GLUCOSE RELEASING RATE (GR) METHOD: GR VALUES OF CARBOHYDRATE-RICH FOODS

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BACKGROUND AND OBJECTIVES

The Glycemic Index (GI) predicts postprandial blood glucose levels but requires invasive blood sampling, posing challenges such as psychological stress, costs, and time consumption. A simpler screening method is needed for developing low-glycemic foods. The Glucose Releasing Rate (GR) method, developed by the ILSI Japan GR Project, measures glucose release from foods to predict glycemic responses. This study assessed the validity of the GR method by comparing GR values with GI values for carbohydrate-rich foods.

METHODS

The GR method involves in vitro simulation of mastication, gastric digestion, pancreatic enzyme treatment, and disaccharide breakdown in the small intestine. GR is expressed as the ratio of glucose concentration at 20 minutes relative to that at 16 hours. GR values of 11 carbohydrate-dominant foods (e.g., rice, bread, noodles, and standard meals) were measured. The available carbohydrate content of these foods ranged from 81 g/100 g (cornflakes) to 14 g/100 g (standard meal). Additionally, low-carbohydrate foods (apples, milk, soybeans) were tested for GR values.

RESULTS

No correlation was found between the available carbohydrate content and GR values ($R^2 = 0.0448$). GR and GI values exhibited a positive correlation ($y = 0.9052x + 8.0098$, $R^2 = 0.6755$). Low-carbohydrate foods showed high GR values. The correlation between 20-minute glucose release and GI values was moderate ($y = 27.394x + 29.112$, $R^2 = 0.6331$).

CONCLUSIONS

The study suggests that GR values reflect the digestibility rather than the quantity of carbohydrates in foods. A strong correlation between GR and GI values for carbohydrate-dominant foods supports the potential of GR as an alternative to GI measurement. Additionally, 20-minute glucose release may serve as an indicator for glycemic response, including for low-carbohydrate foods. Further data accumulation for diverse foods and recipes is necessary.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_126

PROTECTIVE EFFECTS OF ECHINOCHROME A ON HEPATIC STEATOSIS

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BACKGROUND AND OBJECTIVES
Disrupted glucose and lipid metabolisms, along with oxidative stress and inflammation are highly associated with the progression of metabolic dysfunction-associated steatotic liver disease (MASLD). Echinochrome A, a common pigment found in sea urchin (*Echinoidea*), has been reported to exhibit effects on metabolic regulation, inflammation and oxidative stress. However, its effects on hepatic steatosis remain largely unknown. In the present study, we investigated the protective effects and its underlying mechanisms of EchA against hepatic steatosis.

METHODS
HepG2 cells were treated with palmate to induce hepatic steatosis, followed by EchA treatment. The expression of genes involved in hepatic lipid metabolism, oxidative stress, and inflammation were measured using quantitative RT-PCR and western blot analysis. Cellular triglyceride contents and reactive oxygen species (ROS) levels were measured by oil red O staining and 2′,7′-dichlorofluorescein, respectively. The energy metabolism of steatotic HepG2 cells was analyzed by an extracellular flux analyzer.

RESULTS
EchA attenuated the increased the mRNA and protein expressions of the genes involved in lipogenesis and cholesterol metabolisms, i.e. sterol regulatory element-binding protein 1, acetyl-coenzyme A carboxylases, fatty acid synthase and 3-hydroxy-3-methylglutaryl-CoA reductase, in PA-induced steatotic HepG2 cells. In contrast, the expressions of carnitine palmitoyltransferase 1α, acyl-CoA oxidase and peroxisome proliferator-activated receptor alpha were significantly reduced by EchA treatment in hepatic steatosis. EchA decreased cellular ROS levels, accompanied by changes in the expression of antioxidant enzymes. The inflammatory genes including interleukin 1β (Il-1β) and IL-6 were significantly suppressed by EchA in steatotic cell. The effects of EchA on inflammatory genes were attributed to the inhibition of nuclear translocation of nuclear factor-κB. Furthermore, EchA treatment led to alterations in mitochondrial function in hepatic steatosis.

CONCLUSIONS
EchA attenuated lipid accumulation, oxidative stress, and inflammation in hepatic steatosis. Therefore, EchA may have the potential to be developed as a therapeutic agent for the prevention of MASLD.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_128

STUDY ON THE MECHANISM OF DIVISION OF LABOR AND COOPERATION IN GUT MICROBIOTA INDUCED BY POLYSACCHARIDE ALTERNATION

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BACKGROUND AND OBJECTIVES
Polysaccharides, as a type of complex carbohydrate, are widely present in nature and daily diet, playing an important role in maintaining intestinal health, regulating immune function, and other aspects of the body. However, the mechanism by which polysaccharides induce division of labor and cooperation among gut microbiota is currently not fully understood. The aim of this study is to comprehensively analyze metagenomics, transcriptomics, and metabolomics, combined with animal experiments, to explore the mechanism of polysaccharide alternation induced division of labor and cooperation in gut microbiota, in order to provide theoretical basis for regulating gut microbiota balance and promoting overall health.

METHODS
To test the effects of different types of polysaccharides on gut microbiota in an in vitro simulated intestinal environment, high-throughput sequencing technology was used to analyze the gene expression and diversity changes of gut microbiota under the action of polysaccharides, detect the regulatory effect of polysaccharides on gut metabolites, and verify the effects of alternating intake of polysaccharides on gut microbiota structure, gut health, and immune function through animal models. Finally, the comprehensive experimental RESULTS were used to explore the division of labor and cooperation mechanism of gut microbiota induced by polysaccharides.

RESULTS
In vitro simulation experiments and metagenomic analysis have shown that different types of polysaccharides can significantly affect the diversity and abundance of gut microbiota, selectively promoting the proliferation of beneficial bacteria and inhibiting harmful bacteria. Transcriptomics further revealed the precise regulatory mechanism of polysaccharides on gene transcription in microbial communities, while metabolomics found that polysaccharides significantly alter intestinal metabolites and regulate microbial metabolic activity. Animal experiments have ultimately confirmed that alternating intake of polysaccharides can optimize the structure and function of the gut microbiota, enhance the intestinal barrier and immune function of the body.

CONCLUSIONS
This study suggests that alternating intake of polysaccharides can maintain a good balance of gut microbiota by inducing division of labor and cooperation among the microbiota. Reasonably combining the intake types of polysaccharides can more effectively regulate the balance of gut microbiota.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_129

EVALUATION OF THE NUTRITIONAL STATUS AND EATING HABITS OF HOSPITAL EMPLOYEES BASED ON THEIR WORKING SHIFTS

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BACKGROUND AND OBJECTIVES
The shift-based schedules of hospital employees can significantly impact their nutritional habits and overall health status. In this study, it is aimed to evaluate the nutritional status and eating habits of hospital employees based on their shift-based working conditions.

METHODS
The study was conducted between November 2017-March 2018 on a total of 200 individuals aged 21-50 years, working at a hospital. Individuals who volunteered to participate in the study were included. Data were collected face-to-face. The questionnaire, included parameters such as age, gender, marital status, and nutritional status. The analyses were conducted at a 95% confidence level ($p<0.05$).

RESULTS
Of the shift-working participants included in this study, 62.3% were women($p<0.05$). While the average age of non-shift workers was 30.8±7.98 years, the average age of shift workers was found to be 29.7±6.43 years($p<0.05$). Half of the participants were nurses($p<0.05$). Among shift workers, 7% used dietary supplements, whereas this rate was 10.1% among non-shift workers($p>0.05$). Among female shift workers, 51.8% stated that they gained weight after starting the shift system, and 25.9% reported weight loss($p<0.05$). Additionally, 63.8% of shift-working individuals stated that their food consumption had increased($p>0.05$). The proportion of shift workers who skip main meals due to irregular working hours was 58.5%($p>0.05$).

CONCLUSIONS
In conclusion, this study highlights the significant impact of shift-based work on employees' nutritional habits, emphasizing the importance of implementing targeted interventions to support their health and improve workplace conditions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_132

EVALUATING THE PHYSICAL ENVIRONMENT AND MEAL SERVED IN SCHOOL FEEDING PROGRAMS: AN OBSERVATIONAL STUDY IN THE HOHOE, GHANA

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BACKGROUND AND OBJECTIVES
The Ghana School Feeding Program (GSFP) has improved school attendance, enrollment, and academic performance but faces challenges related to unsupportive food environments, hygiene, and sanitation practices. This study aimed to assess the physical environment where school meals are served and consumed to inform actionable improvements.

METHODS
An observational study was conducted in 11 schools in Hohoe Township participating in the GSFP. Between February and March 2023, a checklist adapted from the MEALS4NCDs project was employed to evaluate the physical environment and promote healthy eating. Frequencies and percentages were calculated using Microsoft Excel. Ethical standards and permissions were adhered to.

RESULTS
The assessment revealed deficiencies in infrastructure, hygiene, and program implementation. Ten of the 11 schools used open or partially covered spaces for serving meals, with only two providing proper seating arrangements. Over 90% of students did not have their bowls or cutlery, frequently sharing unwashed items. Hand washing facilities were inadequate; only 18% of schools provided water and soap, while 27% had no water available. None of the schools implemented basic food hygiene measures, such as protecting meals from contamination. Waste management was also poor, with only 45% of schools having rubbish bins, and just 20% being covered. Teacher and head teacher participation in supervising the program was minimal, leading to compromised oversight of food distribution and cleanliness. Additionally, no school displayed materials promoting healthy eating, while nearby shops selling unhealthy snacks further influenced students' dietary habits.

CONCLUSIONS
The GSFP in Hohoe Township faces infrastructure, hygiene, and oversight challenges that limit its effectiveness. Addressing these issues requires investment in designated eating areas, improved hygiene facilities, enforcement of food safety measures, and initiatives promoting healthy eating. Enhancing teacher involvement and stakeholder engagement is critical to improving program supervision and maximizing student benefits.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_133

ASSESSMENT OF THE EFFECT OF HEME IRON CONTENT IN MEAT ON STRUCTURAL CHANGES IN DIETARY NUCLEIC ACIDS CAUSED BY HIGH-TEMPERATURE TREATMENT

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BACKGROUND AND OBJECTIVES
Heme iron in red meat promotes the oxidation of lipids and proteins, contributing to the carcinogenic properties of processed red meat [1]. Most food products are the source of dietary nucleic acids (dietNA) which are prone to oxidation and may also undergo oxidation in the presence of heme iron during thermal processing. This study aimed to assess how thermal processing influences the integrity and oxidation level of dietNA in selected meat samples with varying heme iron levels.

METHODS
Beef, pork, and poultry samples were thermally treated (fried or grilled) under controlled conditions. Microscopic imaging was used to visualize the abundance and distribution of dietNA in the studied samples. DNA was isolated from the samples and heat-induced changes affecting meat DNA integrity were assessed using electrophoresis and comet assay modified to suit the food sample research. Next, to measure levels of oxidatively damaged DNA in tested meat samples, the comet assay was combined with digestion by 8-oxo-2'-deoxyguanosine excision enzyme, formamidopyrimidine DNA glycosylase (Fpg).

RESULTS
Nuclei containing dietNA visible in raw meat structures were preserved after processing. Electrophoresis revealed that both frying and grilling caused dietNA fragmentation in all meat samples. However, comet assay RESULTS showed 70% of nuclear DNA in the comet tail for raw beef samples, indicating the highest fragmentation by nucleases still active in unprocessed meat. Grilling and frying reduced fragmentation to 12% and 3.5%, respectively, probably due to inactivation of endogenous nucleases. A similar trend of decreasing % of DNA in the comet tail after thermal treatment was observed in pork and poultry. Application of Fpg enzyme significantly increased the % of DNA in the comet tail for grilled and fried beef only.

CONCLUSIONS
DNA fragmentation observed in processed and raw meat samples may result from both thermal treatment and hydrolysis by endogenous nucleases present in the examined tissue. Thermal processing of meat leads to inactivation of nucleases, but when intensive, may also lead to degradation of DNA and changes in the appearance of comet tails. The increased % of DNA in the comet tail for grilled and fried beef after Fpg enzyme treatment suggests higher oxidation level in meat with the highest heme iron content.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_134

IMPACT OF STRUCTURAL CHANGES UPON GASTROINTESTINAL DIGESTION OF DIFFERENT CEREALS ON PROTEIN DEGRADATION

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BACKGROUND AND OBJECTIVES
Exploring alternative protein sources of non-animal origin has led to increased interest in utilizing grain cereals as substitutes for food applications. The present study was conducted to determine the impact of the composition and cell wall structure of different cereals on their *in vivo* gastrointestinal protein digestibility, carrying out an in-depth characterization of the structural changes taking place along the digestion process.

METHODS
The digestion of starch and protein was studied in 5-week-old piglets fed six diets: starch-casein, oat, extruded oat, wheat, corn, and rice, plus an N-free control.After four hours, piglets were slaughtered, and digesta samples were collected. A comprehensive analysis and characterization of the liquid/solid fractions of the digests, including nitrogen measurements, SDS-PAGE, particle size, confocal microscopy, nanostructural characterization by small angle X-ray scattering (SAXS) and bile salts quantification, was carried out.

RESULTS
Protein degradation varied at the stomach and jejunum levels depending on the ingredient. Faster protein digestion occurred with rice and wheat, while oat, extruded oat, and corn showed slower degradation. Jejunum digests of rice and starch-casein had smaller particles compared to oats or corn. Images obtained by confocal microscopy showed starch granules still visible in gastric digesta, whose size was related to the structure of the native grains and their susceptibility to be digested. Once in the jejunum, small polysaccharide fragments were observed in the wheat and corn digests, which could be related to a higher content of resistant starch in these substrates. Regarding proteins, these were detected in the jejunum digests in all ingredients except for starch casein and N-free diets. Finally, the RESULTS obtained by SAXS showed more soluble components found in the gastric digests from starch-casein and rice, which may be explained by a greater extent of digestion of these two substrates at the stomach. Regarding the jejunum digests, differences were observed in the scattering patterns of corn and wheat compared to the rest of the ingredients, with soluble particle sizes of 80 nm, which could correspond to partially digested starch or resistant starch fractions.

CONCLUSIONS
The present investigation provides a complete characterization of the gastric and intestinal digests of cereal versus dairy-based diets and clarifies the structural changes at the micro and nanomolecular level of proteins and starch during gastrointestinal digestion. This provides digestion evidence for selecting cereal sources for human consumption.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_136

VIOLA CANESCENS EXTRACT AND ITS BIOACTIVE COMPOUND MITIGATE MUSCLE ATROPHY IN DEXAMETHASONE-INDUCED C2C12 CELLS

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BACKGROUND AND OBJECTIVES
Skeletal muscle atrophy, characterized by the loss of muscle mass and strength, is a hallmark of sarcopenia and related conditions. Violanthin, a flavone glycoside found in *Viola canescens*, exhibits diverse bioactivities; however, its effects on skeletal muscle atrophy have not been investigated. This study aimed to investigate the protective effects of *Viola canescens* extract and violanthin against dexamethasone-induced skeletal muscle atrophy in C2C12 myotubes.

METHODS
C2C12 myoblasts were cultured in differentiation media containing 2% horse serum for 6 days to induce myotube formation. Differentiated myotubes were subsequently treated with 0.2 mM dexamethasone and either 10-100 μg/mL *Viola canescens* extract or 1-20 μM violanthin for 24 h.

RESULTS
Viola canescens extract and its bioactive compound, violanthin, significantly enhanced the cell viability of myotubes exposed to dexamethasone, indicating their protective effects against glucocorticoid-induced muscle atrophy. Both *Viola canescens* extract and violanthin significantly downregulated the transcriptional level of muscle atrophy-related genes, including Trim63 (Murf1) and Fbxo32 (Mafbx), which are key mediators of muscle protein degradation pathways. Additionally, *Viola canescens* extract and violanthin also reduced the induction of Foxo3a transcription factor, a critical upstream regulator of these atrophy-related genes. Furthermore, *Viola canescens* extract and violanthin suppressed apoptotic marker expression, such as Casp3, a gene associated with programmed cell death, by modulating the balance between pro-apoptotic Bax and anti-apoptotic Bcl2l.

CONCLUSIONS
Viola canescens extract and its bioactive compound, violanthin, demonstrate protective effects against dexamethasone-induced skeletal muscle atrophy by enhancing cell viability, suppressing muscle atrophy-related gene expression, and modulating apoptotic pathways.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_137

QUALITY OF POST-OPERATIVE FEEDING FOR VISCERAL SURGERY PATIENTS IN TWO HOSPITAL

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BACKGROUND AND OBJECTIVES
Malnutrition in hospitals, particularly within surgical departments, is a significant yet under recognized issue. It often stems from inadequate nutrition due to poor dietary management during hospitalization. This study investigated the quality of postoperative nutrition provided in visceral surgery departments at two hospitals. The objectives were twofold: first, to compare patients' nutritional intake with established recommendations, and second, to explore the relationship between diet quality and postoperative nutritional status.

METHODS
This cross-sectional study was conducted over four months and included 90 patients who had undergone visceral surgery. The primary variables were assessed by evaluating the extent to which patients' nutritional needs were met, including energy, protein, vitamins A, C, and D, zinc, and iron intake. Additionally, an overall diet quality score was calculated. Ethical approval for the study was obtained in advance, and data were analyzed using appropriate statistical software.

RESULTS
Postoperative malnutrition was observed in 60% of patients. A considerable proportion had inadequate intake of energy (57.8%), protein (56.7%), Zinc (62,2%),vitamin A (58.9%), and iron (65.5%). over time, more than half of the patients had normal vitamin C (58,9%) and vitamin D (51,1%). Overall, 62.2% of patients equivalent to roughly three out of five were found to have poor-quality diets postoperatively. A statistically significant relationship ($p < 0.01$) was identified between diet quality and postoperative nutritional status. Among patients discharged with malnutrition, 81.48% (44 out of 54) had been provided with diets of poor quality.

CONCLUSIONS
The quality of postoperative nutrition in visceral surgery departments was largely insufficient and failed to meet patients' nutritional requirements. Systematic evaluation of nutritional status and dedicated postoperative dietary management should be prioritized as integral components of care for surgical patients.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_139

EVALUATION OF NUTRITIONAL QUALITY OF COMPLEMENTARY FOODS FORMULATED FROM BLENDS OF NIGERIAN YELLOW MAIZE (ZEA MAYS), SOYBEAN (GLYCINE MAX) AND CRAYFISH (PROCAMBARUS CLARKII)

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BACKGROUND AND OBJECTIVES
Plant-based complementary foods (CFs) generally supply insufficient amount of nutrients to meet recommended nutrient intakes for 6–23 months old children. This study determined the nutritional quality of CFs formulated from blends of Nigerian yellow maize (*Zea mays*), soybean (*Glycine max*) and crayfish (*Procambarus clarkii*).

METHODS
Three CFs were formulated, namely; maize flour (MF, 100 g), blends of maize and soybean flour (MSF, 72:28 g) and maize, soybean and crayfish flour (MSCF, 80:10:10 g). Nutritional quality was evaluated using analyses of chemical composition of CFs, and biology quality of complementary food diets (CFDs) fed to weaned Sprague Dawley rats fed. Data were compared by Multivariate Analysis of Variance and significantly differentiated at $P \leq 0.05$. Nine selected nutritional criteria were used to determine CF that possessed optimal nutritional characteristic on comparison with MF and fortified wheat flour (FWMF).

RESULTS
Total scores obtained from selected nutritional criteria ranked MSCF, having total score of 22, the lowest and thus considered to possess the most desirable nutritional characteristics compared to MF, MSF and commercial CF (FWMF) that had the respective total score of 54, 39 and 33.

CONCLUSIONS
Conclusively, MSCF may serve as a better alternative CF for MF and MSC, which compared favourably with FWMF. This study has produced a potential alternative cost-effective and adequate CF, formulated from crayfish (*Procambarus clarkii*) supplementation of locally available blend of yellow maize (*Zea mays*) and soybean (*Glycine max*), for the poor human population, in order to encourage the consumption of animal-sourced CF for alleviating the prevalence of childhood undernutrition.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_140

IMPACT OF A SWITCH DIET AFTER HIGH-FAT DIET INDUCED OBESITY COMBINED WITH AGING ON CARDIAC FUNCTION

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BACKGROUND AND OBJECTIVES
Aging and obesity both contribute to the onset of metabolic disorders and cardiovascular disease. Whether aging worsens high-fat diet (HFD)-induced obesity cardiac alterations in a murine model is not yet demonstrated. Furthermore, the beneficial effect of a weight loss induced by switch diet (SD), from HFD to control diet (CD) has been demonstrated on cardiac remodelling and function in young mice but not in aged mice.
Our aim was first to assess the impact of HFD in old mice and to evaluate the reversibility of HFD-induced cardiac alterations by SD in young and aged mice.

METHODS
We performed a study in young (5-month-old) and old (12-month-old) mice, fed with HFD (60% fat + 5% sucrose) for 20 weeks or switched to CD for 8 weeks (SD group) after 12 weeks of HFD. We performed metabolic tests (GTT, ITT) and echocardiography [cardiac function assessed by left ventricular ejection fraction (LVEF) and systolic strain rate (SR)].

RESULTS
The comparison between young and old mice in CD groups shows that aging increases the body weight, adiposity index and cardiac hypertrophy and impairs myocardial function (SR but not LVEF). HFD regimen increases similarly body weight and adiposity index in both young and old mice, whilst cardiac function is impaired with a similar decrease of systolic SR in young and old mice. SD induces a similar weight loss and decrease of the adiposity index in young and old mice. However, SD improves systolic function assessed by SR in young but not aged mice. Interestingly, this improvement in SR was associated with an amelioration of glucose tolerance in young mice.

CONCLUSIONS
Our data demonstrate that HFD-induced obesity and SD-induced weight loss modulate cardiac function differently with aging. Thus, the improvement of cardiac function by SD in young mice is not found in old mice.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_142

HEALTH BENEFITS OF CHEESE: A REVIEW OF CURRENT LITERATURE

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BACKGROUND AND OBJECTIVES
Cheese is a widely consumed dairy product with a rich nutritional profile. This review aims to summarize the current literature on the health benefits of cheese, focusing on its impact on cardiovascular disease (CVD) and type 2 diabetes (T2D).

METHODS
A comprehensive literature search was conducted using databases such as PubMed and Google Scholar. Studies included in this review were published between 2010 and 2023 and examined the effects of cheese consumption on CVD and T2D risk.

RESULTS
The literature indicates that moderate cheese consumption is associated with several health benefits, including a notably lower risk of developing CVD (moderate evidence) and T2D (low evidence). It is important to note that studies often vary between examining cheese as a broad category and focusing on specific products. Multiple studies report a reduction in LDL cholesterol levels compared to butter and no increase in blood triglyceride levels after consumption. Regarding glycemia, there is no alteration in basal glycemia, potential benefits in reducing postprandial glycemia, and no modification of glycated haemoglobin levels. Data on the Homeostatic Model Assessment (HOMA) and insulin are currently contradictory. Cheese consumption has also been shown to positively influence gut microbiota, promoting the growth of beneficial bacteria. Other biological markers, such as inflammation, have been explored, but the data remain contradictory. There are no data on the effects of cheese consumption on oxidative stress and arterial pressure.

CONCLUSIONS
The reviewed studies suggest that cheese can be a beneficial addition to a balanced diet, contributing to improved cardiovascular health, diabetes and gut microbiota. Further research is needed to fully understand the long-term health impacts and underlying mechanisms.

CONFLICTS OF INTERESTS
Lactalis

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EPO8_144

MODELING OF THE EFFECTS OF SLOW DIGESTIBLE STARCH (SDS) CONTENT IN CEREAL PRODUCTS ON GLUCOSE METABOLISM

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BACKGROUND AND OBJECTIVES

Starch is a major source of carbohydrates in cereal products. Starch digestibility mainly depends on technological processes. The preservation of Slowly Digestible Starch (SDS) levels in cereal products has beneficial effects on postprandial glucose absorption kinetics and glucose metabolism. Understanding the range of SDS content associated with positive physiological effects is of high interest to develop starchy foods that contribute to improved glycemic control and insulin sensitivity.In this study, we analyzed the relationship between SDS in cereal products and parameters of glucose metabolism, such as the appearance rate of exogenous glucose (RaE) and postprandial glycemic and insulinemic responses.

METHODS

We conducted a statistical meta-analysis on ten randomized controlled clinical trials studying the effects of consuming cereal products (biscuits and extruded products) with a wide range of SDS contents on glucose metabolism in healthy and overweight individuals (190 subjects). SDS content in biscuits varied from 8g to 21g per portion while SDS content in extruded products was less than 1g per portion. We built prediction models to simulate the contribution of SDS to RaE kinetics and glycemic response parameters such as delta peak of glycemia (Δ peak) and maximum concentration of blood glucose (*C*max g), and we expressed SDS as g per portion or as a percentage of available starch (%SDS/avStarch).

RESULTS

We found that for cereal products with SDS content higher than 7g per portion and higher than 35%/avStarch the predicted contribution to the RaE kinetics between 125 and 240 minutes was more important (increased up to 2-fold) compared to cereal products with low SDS content (less than 1g per portion and 3%/avStarch). Regarding glycemic response parameters, we found that the predicted Δ peak was reduced by 1,4-fold in cereals products with SDS content higher than 7g per portion and higher than 35% SDS/avStarch compared to low SDS condition. Similar RESULTS were obtained with *C*max g parameter.

CONCLUSIONS

SDS modeling in cereal products and the predicted effects on glucose metabolism helps to identify the range of SDS and available starch needed to induce beneficial metabolic response during postprandial phase. Indeed, formulation of cereal products with high SDS content is an important nutritional parameter to build healthier diets. Recently, it has been demonstrated that high SDS diet improved glycemic control in type 2 diabetes patients.

CONFLICTS OF INTERESTS

Olivier Brack is employed by Société K.S.I.C.Séverine Olivier, Alexandra Meynier and Sophie Vinoy are employed by Mondelez.

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EPO8_145

VITAMIN D STATUS AND ITS DETERMINANTS IN YOUNG ADULTS IN SELECTED RURAL AREA IN SRI LANKA

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BACKGROUND AND OBJECTIVES
Vitamin D is a fat-soluble vitamin that is essential in musculoskeletal health. However, no recent studies have been conducted in Sri Lanka to identify the vitamin D status and its determinants in young adults in Sri Lanka. This study aimed to identify vitamin D status and factors associated with vitamin D status among young adults in a selected rural area in Sri Lanka.

METHODS
A cross-sectional study was conducted in selected 3 villages located in North Central Province in Sri Lanka, recruiting 75 young adults. General questionnaire was used to identify the socio-demographic and economic information of the participants. Sun exposure questionnaire was used to identify the sun exposure determinants. Diet diaries were used to determine the vitamin D intake using a computer software. Weight and height were also measured. Serum 25(OH)D concentration was measured in blood samples using the ELISA technique. SPSS software was used for the statistical analysis of data.

RESULTS
Mean serum 25(OH)D concentration of the participants was 19.87 ± 7.27ng/mL. Prevalence of vitamin D sufficiency, insufficiency and deficiency were 39% (n=29), 53% (n=40) and 8% (n=6), respectively. Vitamin D status was associated with gender (p=0.01), where the mean serum 25(OH)D for males (22.19 ± 8.42ng/mL) was significantly higher than for females (17.61 ± 5.09 ng/mL). Age (p=0.013) and vitamin D intake (p=0.032) showed significant positive associations with serum 25(OH)D concentration. Nature of the occupation (p=0.021), duration of sun exposure (p =0.003), sun avoidance (p=0.050) and skin exposure area during weekdays (p=0.019) and weekend days (p =0.043) were significantly associated with serum 25(OH) D concentration. Body Mass Index (BMI), ethnicity, religion, monthly income, education level, alcohol and tobacco use were not significantly associated with serum 25(OH)D concentration

CONCLUSIONS
Nearly half of the population was vitamin D deficient and insufficient. The findings of this study can be used to educate the general public about the importance of sun exposure in order to improve vitamin D status. Further studies are required to identify the vitamin D status in a representative sample of young adults in Sri Lanka.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_148

IRON ABSORPTION AND VARIATIONS OF IRON STATUS PARAMETERS, HEPCIDIN, INFLAMMATORY MARKERS AND SEX HORMONES DURING THE MENSTRUAL CYCLE

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BACKGROUND AND OBJECTIVES
Menstruation and the menstrual cycle, despite being primary factors in iron deficiency and anemia, have not been extensively researched as focal points for combating anemia. Data on fluctuations in iron status markers, hepcidin, and sex hormones throughout the menstrual cycle—and their impact on iron absorption—remain limited and ambiguous. This exploratory study aimed to measure and compare changes in iron absorption, iron status, hepcidin, inflammatory markers, and the hormones estrogen and progesterone at various points in the menstrual cycle. The long-term goal was to identify the best timing for iron supplementation. Our hypotheses were: (1) changes in iron absorption would correlate with phases of the menstrual cycle, enabling identification of optimal timing for supplementation; (2) the investigation of iron status and related parameters would reveal insights into the underlying mechanisms affecting iron absorption.

METHODS
In this single-blind, randomized crossover trial, 10 female students aged 18-30 with normal BMI and low iron stores started bi-daily blood sampling on the second day of their menstrual cycle, continuing through day 28 of a 40-day study. Iron absorption was measured from six isotopically labeled meals, administered in two blocks, using different iron isotopes. The study monitored hemoglobin, iron biomarkers, hepcidin, inflammatory markers, and sex hormones, and iron absorption using red blood cell incorporation of stable isotopes 14 days after administration.

RESULTS
Preliminary RESULTS suggest that menstruation may significantly impact iron deficiency and anemia, with inflammatory processes, particularly IL-6, potentially affecting iron absorption during hormonal shifts in the menstrual cycle. Unexpectedly, higher hepcidin levels were observed in the early follicular phase, differing from previous studies. This discrepancy may relate to variations in inflammation and iron status markers, requiring further investigation. Early findings indicate that IL-6, alongside hormones such as estrogen and progesterone, may regulate hepcidin, highlighting complex interactions between inflammation and hormone-driven iron metabolism.

CONCLUSIONS
Our preliminary findings point to the luteal phase as a potentially better time for iron supplementation, although additional research is needed. The study's gender-sensitive approach highlights the importance of tailored intervention strategies for addressing iron deficiency in menstruating women.

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EPO8_149

ECO-FRIENDLY EXTRACTION OF LEMON BALM: HARNESSING NADES FOR ENHANCED BIOACTIVE COMPOUND RECOVERY

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BACKGROUND AND OBJECTIVES
Lemon balm (*Melissa officinalis*, Lamiaceae) is a medicinal herb rich in bioactive compounds, often extracted using techniques like NADES (Natural Deep Eutectic Solvents) to enhance yield and preserve stability. This eco-friendly extraction method offers a sustainable approach to obtaining antioxidants, polyphenols, and other valuable phytochemicals.

METHODS
This study focused on evaluating the extraction of phenolic compounds, including phenolic acids and flavonoids, from lemon balm cultivated at the Institute for Medicinal Plant Research. Two natural deep eutectic solvents, choline chloride/glucose (1:2) and choline chloride/urea (1:1), were employed for the extraction. The phenolic compound content in the extracts was analyzed using high-performance liquid chromatography (HPLC).

RESULTS
The choline chloride/glucose mixture proved to be more effective for the extraction of phenolic acids and flavonoids from lemon balm. Using this solvent, gallic, chlorogenic, p-hydroxybenzoic, caffeic, coumaric, and ferulic acids were extracted, as well as epicatechin, quercetin, and naringenin. The concentrations of the extracted compounds ranged from 15.02 to 196.04 mg/g of crude drug, with caffeic acid being the dominant component. The choline chloride/urea solvent was effective only for the extraction of gallic acid.

CONCLUSIONS
Choline chloride/glucose NADES demonstrated considerable potential as eco-friendly solvents for extracting phenolic acids and flavonoids from lemon balm. The findings underscore the effectiveness of choline chloride/glucose for caffeic acid extraction and suggest broader applications of NADES in cosmetic and pharmaceutical industries.

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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_151

FOOD COMPLEXITY: EFFECTS ON EATING RATE AND ORAL PROCESSING BEHAVIOURS

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BACKGROUND AND OBJECTIVES
The complexity of food is characterized by the number of sensory components and the sensations they elicit. Studies have explored the complexity of taste, aroma, appearance, and texture in food. It has been proposed that meals with high sensory complexity can modify oral processing behaviors, decrease eating speed and energy intake, and enhance satiation and satiety responses. This study aims to analyze the effect of food texture complexity on eating rate and oral processing behaviors.

METHODS
The study involved 30 young adults aged between 18 and 35, 15 men and 15 women with a healthy BMI and fat percentage. Various measurements were conducted, including (a) body composition and basal metabolism using the Inbody 370 and SECA stadiometer; (b) eating rate in kcal/min; and (c) components of oral processing behavior (duration, number of bites, and chewing) through videotaping and observation during meal sessions. The participants were served two types of sandwich rolls: low complexity (BC) and high textural complexity (AC). Statistical analysis was carried out using STATA version 12.0, employing repeated measures ANOVA, Fridman, T-Student, Wilcoxon, Ramsey, Pearson, and Cochran-Mantel-Hanzel tests.

RESULTS
The primary findings indicated that participants exhibited a greater number of bites ($F: 5.27$; $p < 0.05$) and a decreased eating rate in kcal per minute ($F: 4.90$; $p < 0.05$) when consuming the AC sandwich roll compared to the texturally simpler BC roll. Furthermore, males demonstrated a higher eating rate than females (1071 vs 759; $p<0.05$, $n=60$). Additionally, a positive correlation was observed between skeletal muscle mass ($r: 0.2649$; $p < 0.05$) and basal metabolic rate with eating speed ($r = 0.2636$; $p < 0.05$; $n = 60$).

CONCLUSIONS
Biological factors such as skeletal muscle mass, basal metabolic rate, and sex play a role in mediating elements of eating behavior. However, sensory attributes, such as food complexity, effectively modulate aspects such as eating rate and oral processing behaviors.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_152

EVALUATION OF FOOD LITERACY, SUSTAINABLE AND HEALTHY EATING BEHAVIORS IN FOOD SERVICE SYSTEMS EMPLOYEES

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BACKGROUND AND OBJECTIVES
The environmental impacts of Food Service Systems (FSS) are assessed across production, distribution, preparation, service, and waste management stages. Individuals employed in this domain should be incorporated into developing practices and strategies for sustainable and healthy eating (SHE) behaviors. Food literacy (FL) can be the foundation for adopting SHE behaviors and diet quality. This study aimed to assess the correlation among FL, diet quality and SHE behaviors among FSS employees.

METHODS
The research involved 173 FSS employees, comprising 100 males (57.8%) and 73 females (42.2%), aged 18 to 64 years, employed in university kitchens and dining halls. The socio-demographic characteristics of the individuals participating in the study were questioned. The SHE behaviors scale, self-perceived food literacy (SPFL) scale and a questionnaire including 24-hour dietary recalls were administered face-to-face. Healthy Eating Index-2020 (HEI) was used to evaluate diet quality. Data were analyzed using the SPSS 24.0 program, with a significance level set at $p<0.05$.

RESULTS
The mean age of the study participants was 42.5±9.45 years for males and 40.2±10.26 years for females, respectively**.** The present study included FSS staff; 24.9% were chefs, 5.2% were sous chefs, 53.8% were waiters, and 16.2% were dishwashers. A statistically significant positive moderate correlation was found between the total score of the SHE behaviors scale and the total score of SPFL (r: 0.593, $p<0.001$). A statistically significant positive correlation existed between the SPFL total score and the HEI total score (r:0.160, $p<0.05$). A statistically significant difference in SPFL total scores was found among occupational categories ($p<0.05$).

CONCLUSIONS
Improving food literacy among FSS employees is believed to influence SHE behaviors and diet quality positively. This is important for improving individual health and raising awareness of sustainable food systems.

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CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_158

COMBINED INFLUENCE OF PHENOLIC ACIDS AND Ω-3 FATTY ACIDS ON INFLAMMATORY PROCESSES: INHIBITION OF PROSTAGLANDIN E2 AND THROMBOXANE A2 PRODUCTION IN VITRO

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BACKGROUND AND OBJECTIVES

Inflammation is an immune response to injurious stimuli (microbiological, chemical, or mechanical), that triggers pro-inflammatory mediators like prostaglandins, cytokines, and leukotrienes, contributing to the pathogenesis of several diseases, including cardiovascular disorders, autoimmune diseases, and cancer. Dietary compounds, such as phenolic acids and ω-3 fatty acids, are recognized as potential anti-inflammatory agents. Based on this premise, the aim of this study was to evaluate the anti-inflammatory potential of three phenolic acids (caffeic, *p*-coumaric, and ferulic acid) and ω-3 fatty acids: eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), both individually and in combination.

METHODS

Anti-inflammatory activity was assessed using an *in vitro* cell-based model system with human leukemic monocytes (U937 cell line), in which inflammation was induced by lipopolysaccharide (LPS). The levels of pro-inflammatory mediators, prostaglandin E2 (PGE2) and thromboxane A2 (TXA2), were quantified using the LC-MS/MS technique. RESULTS are expressed as percentages of PGE2 and TXA2 production relative to the control.

RESULTS

The RESULTS demonstrated that combinations of EPA and DHA with *p*-coumaric acid were the only ones to significantly inhibited PGE2 production, with reductions of 10 and 11%, respectively. Notably, the synergistic effects of the individual components were most pronounced in these combinations. Conversely, all tested combinations of phenolic acids and ω-3 fatty acids significantly reduced TXA2 production under inflammatory conditions, from 17 to 33%. Synergistic effects were observed for EPA combined with caffeic acid, as well as for DHA in mixtures with caffeic or ferulic acids. In contrast, the other components in the remaining combinations exhibited antagonistic interactions.

CONCLUSIONS

These findings highlight the substantial anti-inflammatory effects of specific combinations and contribute to ongoing research into the therapeutic potential of phenolic acids and ω-3 fatty acids in inflammation.
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The authors have no conflict of interest.

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EPO8_159

NUTRIENT INTAKE INADEQUACY CORRELATES WITH POOR COGNITIVE FUNCTION OF ATHLETES IN THREE MAJOR SPORTING REGIONS IN GHANA

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BACKGROUND AND OBJECTIVES
Nutrition is central to the performance optimization of athletes. However, nutrient intake, and its association with cognitive functions of performance such as reaction time and concentration of athletes has been scarcely studied. The study sought to evaluate the nutrient intake and their association with the indicators of cognitive function of athletes from three major sporting disciplines in Ghana.

METHODS
This was a cross-sectional study where participants' dietary intake was determined using multiple 24hr recall, and anthropometric parameters were also measured. All study participants were made to take a concentration grid test and ruler drop reaction time test to measure their concentration and reaction time respectively. The data were analyzed using SPSS to establish associations at a 95% confidence interval

RESULTS
The mean reaction time, and concentration, scores of athletes with an average weight of 59.3 ± 12.6kg were 193.8 ± 21.6 ms, and 33.3 ± 12.6 respectively. Dietary carbohydrate (4.3 ± 1.7 g/kg.day-1) and protein intake (0.9 ± 0.5 g/kg.day-1) were below recommendation. More than half of them had inadequate dietary calcium (99.6%), iron (60.5%), zinc (82.4%), folate (76.1%), riboflavin (80.9%), vitamin C (83.2%), and B12. (100%) Most athletes (79.7%) had inadequate energy intake with an average energy deficit of 1377.6 kcal. The calorie intake, reaction time and concentration were respectively more improved among the track athletes (2253.5 kcal, 187.4ms, 40.20) than the boxers (1656.9kcal, 203.0ms, 25.44) and football players (1387.2kcal, 194.0ms, 31.76). Folate, Vitamin C and B6 correlated ($p < 0.05$) with reaction time. Energy intake ($p = 0.016$) could account for about 2.0 and 2.7% of the variation in reaction time and concentration respectively.

CONCLUSIONS
Most athletes did not meet the requirements for energy and micronutrients. Calories predicted a very small but significant variation in concentration and reaction time, measured as indicators of cognitive function.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_162

EXPLORING THE LINK BETWEEN NUTRITIONAL STATUS, ANTHROPOMETRIC PROFILES AND DIETARY ANTIOXIDANT IN HEMODIALYSIS PATIENTS

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BACKGROUND AND OBJECTIVES
In patients with Chronic Renal Failure (CRF), complications are based on increased oxidative stress. CRF patients, often facing negative clinical and nutritional status caused by persistent oxidative stress and chronic inflammation. This study investigated that evaluation of the relationship between nutritional status, anthropometric measurement, and dietary antioxidant capacity in hemodialysis (HD) patients.

METHODS
This case-control study included 44 (female n=12, male n=32) HD patients (mean age=56,89±15,94), and 44 (female n=12, male n=32) healthy individuals (mean age=57,66±10,89). General characteristics were assessed through a questionnaire, while nutritional and inflammatory status were evaluated using the Subjective Global Assessment-7P (SGA-7P) and Malnutrition Inflammation Score (MIS). Anthropometric measurements, including body weight (post-hemodialysis, kg), height (cm), Body Mass Index (BMI), calf circumference (cm), triceps skinfold thickness (mm), and handgrip strength (kg), were obtained using standardized methods and calibrated instruments. Dietary antioxidant capacity was analyzed via an antioxidant food frequency questionnaire. Statistical analyses were performed using the Pearson correlation for normally distributed data and, Mann-Whitney U test for non-normally distributed data with SPSS (version 27).

RESULTS
HD patients had significantly lower SGD-7P ($Z=-4.509$, $p<0.001$) and MIS ($Z=-7.059$, $p<0.001$) scores than healthy participants. Similarly, the case group had significantly lower values for weight ($t=2.249$, $p=0.027$), calf circumference ($t=-3.615$, $p<0.001$), and hand grip strength ($Z=3.981$, $p<0.001$). Furthermore, the dietary antioxidant capacity of the case group was significantly lower compared to the control group ($t=-12.588$, $p<0.001$). In the case group, significant positive correlation was identified between dietary antioxidant capacity and hand grip strength ($r=0.385$, $p=0.010$), suggesting that an increase in hand grip strength may be associated with a rise in dietary antioxidant capacity. In the control group, a weak but significant positive correlation was found between dietary antioxidant capacity and both calf circumference ($r=0.447$, $p<0.002$), and triceps skinfold thickness ($r=0.355$, $p<0.018$). However, no significant correlation was observed between dietary antioxidant capacity and SGD-7P or MIS scores in both groups.

CONCLUSIONS
In HD patients, nutritional deficiencies and decreased antioxidant intake may reduce body resistance and increase inflammation compared to healthy individuals.
This study supported by TÜBİTAK (The Scientific and Technological Research Council of Türkiye).

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_165

FUNCTIONAL ANALYSIS OF AFRICAN-CENTRIC POLYMORPHISMS OF THE ZINC TRANSPORTER GENE SLC39A10

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BACKGROUND AND OBJECTIVES

Zinc is an essential nutrient involved in numerous biological functions. Its homeostasis is tightly controlled through the coordinated action of two transporter families: SLC30A (ZnT), mediating efflux, and SLC39A (ZIP), facilitating influx. ZIP10 (encoded by *SLC39A10*) plays an integral role in maintaining cytosolic zinc levels. This study investigates the functional impact of population-specific missense mutations in *SLC39A10*, focusing on variants prevalent in African populations.

METHODS

Through gnomAD human genome database screening, three single nucleotide polymorphisms (SNPs) in *SLC39A10* with the highest global allele frequencies were identified to be prevalent in African populations. *In silico* analyses (e.g., SIFT, AlphaFold) were performed to predict the potential impact of the variants, and *SLC39A10* open reading frame (ORF) constructs containing the respective mutations were transfected into 293T cells for further investigation of their functional consequences.

RESULTS

Overexpression of wild-type and mutant *SLC39A10* ORFs was confirmed at both mRNA and protein levels. No apparent differences were observed among the mutations in the expression of ZIP10 and biomarker genes (*MT1X* and *MT2A*). However, two SNPs demonstrated a significant decrease in the metallothionein induction by supplemental zinc treatment, suggesting impaired zinc import activity. Notably, these two SNPs reside within histidine-rich domains, previously identified to play a vital role in the zinc transport function of ZIP proteins. Ongoing studies include detailed characterization of zinc transport kinetics and subcellular localization analyses.

CONCLUSIONS

We identified functionally significant ZIP10 variants specific to African populations, potentially representing genetic adaptations in zinc metabolism. These findings have implications for population-specific approaches to addressing zinc deficiency and underscore the importance of investigating the systemic health impacts of these genetic variations.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_166

EFFECTS OF FUNCTIONAL LIPIDS ON LIPID METABOLISM ALTERATIONS INDUCED BY A CAF DIET IN A MURINE MODEL

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BACKGROUND AND OBJECTIVES
The cafeteria diet (CAF), high in saturated fats and simple carbohydrates, leads to metabolic disorders associated with chronic non-communicable diseases (NCDs). Functional lipids (FL), such as those present in virgin flaxseed oil (FO), as well as the conjugated linoleic acid (CLA), may regulate lipid metabolism. The aim was to study the effect of FO and CLA, alone or combined (FLc), on the alterations on lipid metabolism of rats fed CAF diet.

METHODS
Male Wistar rats (~300g) were divided into 5 groups (n=6) and fed for 10 weeks with: control (C): 4% soybean oil; CAF: 35% lipids; CAF+FO: 26% lipids + 9% FO; CAF+CLA: 34% lipids + 1% CLA; CAF+FLc: 25% lipids + 9% FO + 1% CLA. Energy intake, body weight (BW) gain, and adipose tissue (AT) weight, were assessed. Hepatic TAG levels, in vivo TAG secretion rate (TAG-SR), expression of genes and activity of enzymes related to fatty acid lipogenesis and β-oxidation in liver and AT were analysed. Data were evaluated using One-Way ANOVA, followed by Tukey's test, or by T-test ($p<0.05$).

RESULTS
The CAF vs C group increased energy intake (+50%), BW gain (+45%), adiposity (+13%), and hepatic TAG levels (+21%). The CAF+FLc vs CAF group reduced BW gain (-15%), AT weight (-19%), and hepatic TAG levels (-16%). The attenuation of hepatic steatosis observed in the CAF+FLc group could be linked to an increased TAG-SR (+26%) and upregulation of MTTP expression (+18%). Additionally, higher hepatic PPARα expression (+94%) enhanced peroxisomal oxidation through increased ACOX1 mRNA levels (+40%). In AT, reduced SREBP-1c expression (-85%) decreased lipogenesis, as evidenced by lower FAS activity (-41%). Individual effects of functional lipids were also observed. Compared to the CAF group, FO supplementation improved hepatic CPT-1a activity (CAF+FO: +40%; CAF+FLc: +26%), while CLA supplementation increased PPARα mRNA levels in AT (CAF+CLA: +1912%; CAF+FLc: +4729%), promoting oxidative genes like UCP2 (CAF+CLA: +171%; CAF+FLc: +90%), and enhancing CPT-1b expression and activity (CAF+CLA: +237% and +41%; CAF+FLc: +163% and +33%).

CONCLUSIONS
The combination of FO and CLA mitigates the metabolic alterations induced by a CAF diet, as evidenced by reductions in adiposity and hepatic TAG levels. These effects are linked to enhanced TAG-SR and β-oxidation processes. These findings suggest that FL can mitigate CAF diet-induced dysregulations, providing potential strategies for dietary management of lipid metabolism disorders.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_167

INVESTIGATING SCHWANN CELL DAMAGE MECHANISMS IN DIABETIC PERIPHERAL NEUROPATHY UNDER LOW CHOLESTEROL CONDITIONS

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BACKGROUND AND OBJECTIVES
Diabetic peripheral neuropathy (DPN) is a common complication of diabetes characterized by nerve damage and microvascular dysfunction. Cholesterol is vital for myelin integrity, with Schwann cells playing a key role in nerve repair. Both high and low cholesterol levels are linked to severe neuropathy, raising concerns about the risks of aggressive cholesterol-lowering strategies. Given the role of nutrition in lipid metabolism and neural health, this study investigates how dietary factors influence Schwann cell function and explores the potential benefits of mono- and polyunsaturated fatty acids (MUFA and PUFA) in managing DPN.

METHODS
RSC96 Schwann cells were treated with high-glucose and low-cholesterol conditions using methyl-β-cyclodextrin (MβCD) to simulate cholesterol depletion. Cell viability, oxidative stress, and survival were assessed, with MUFA and PUFA supplementation evaluated for protective effects. Diabetic mouse models were used to study the impact of low cholesterol on neuropathy symptoms and the therapeutic potential of dietary PUFA. Clinical data were analyzed to explore associations between lipid profiles, dietary habits, and neuropathy severity.

RESULTS
Aging and diabetic nephropathy were associated with severe neuropathy, while glycemic control showed no significant correlation. Abnormalities in LDL and HDL cholesterol levels strongly correlated with neuropathy severity. Cholesterol depletion in Schwann cells reduced viability and increased oxidative stress under high-glucose conditions. Dietary MUFA and PUFA mitigated these effects, with PUFA showing superior protective effects by reducing oxidative damage and enhancing cell survival. In diabetic mouse models, low cholesterol worsened neuropathy symptoms, while PUFA supplementation improved nerve function, reduced oxidative stress, and supported myelin repair. Clinical data showed a U-shaped relationship between cholesterol levels and neuropathy severity, underscoring the importance of balanced lipid intake.

CONCLUSIONS
Cholesterol is critical for Schwann cell function and neural repair, but excessive cholesterol reduction can impair these processes. Dietary PUFA demonstrated significant neuroprotective effects, reducing oxidative damage and supporting nerve repair in both cellular and animal models. These findings emphasize the importance of nutritional strategies in managing DPN, particularly through lipid profile optimization and PUFA supplementation. Targeted dietary interventions should be integrated into diabetes care to balance cardiovascular health and neural protection. Further studies are needed to refine dietary guidelines and therapeutic approaches for DPN.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_168

EFFECTS OF GLP-1 RA SEMAGLUTIDE AND ADIPORON ON LIPID DROPLET ACCUMULATION AND OXIDATIVE STRESS IN PANCREATIC B CELLS

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BACKGROUND AND OBJECTIVES
Non-alcoholic fatty pancreas disease (NAFPD) is a metabolic disorder characterized by ectopic lipid deposition in the pancreas, impairing β-cell function and increasing the risk of type 2 diabetes (T2D). Dietary patterns and nutrient excess, particularly high-fat and high-carbohydrate intake, are critical contributors to its progression. This study examines the potential of the GLP-1 receptor agonist (GLP-1 RA) Semaglutide and the adiponectin receptor agonist AdipoRon to mitigate the adverse effects of nutrient overload on pancreatic β-cells, focusing on lipid droplet (LD) accumulation, oxidative stress, and cellular functionality.

METHODS
Human β-cells (1.4E7 cell line) were treated with free fatty acids (FFA) under high-glucose conditions for 24 hours. Interventions included Semaglutide, AdipoRon, or a combination of both. LD accumulation was assessed using Nile Red staining, oxidative stress was measured with DCFH-DA fluorescence, and high-content analysis quantified LD size and number. Mitochondrial membrane potential was evaluated using JC-1 staining, and apoptosis markers were analyzed via Western blotting. β-cell functionality was assessed through insulin secretion assays and preproinsulin mRNA expression.

RESULTS
High-glucose and FFA exposure significantly increased LD accumulation, oxidative stress, and apoptosis, while reducing mitochondrial function and β-cell viability. Semaglutide treatment reduced LD accumulation, oxidative stress, and apoptosis while preserving mitochondrial membrane potential. The combination of Semaglutide and AdipoRon demonstrated enhanced effects, further reducing LD size and number, restoring mitochondrial integrity, and improving insulin secretion and preproinsulin mRNA expression.

CONCLUSIONS
Semaglutide and AdipoRon provide synergistic protection against nutrient-induced β-cell dysfunction by reducing oxidative stress, modulating lipid metabolism, and preserving mitochondrial function. These findings suggest that targeting lipid metabolism and oxidative stress could offer an effective therapeutic approach for managing NAFPD. Moreover, modifying nutritional strategies to enhance adiponectin signaling may further potentiate the efficacy of Semaglutide in combating NAFPD. Further studies are warranted to explore the clinical applicability of these interventions in addressing nutrient-driven metabolic disorders.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_169

MACRONUTRIENT BALANCE CONTRIBUTES TO HUMAN GUT MICROBIOME DIVERSITY: IN VITRO DIGESTION AND GUT FERMENTATION OF PULSES AND VEGETABLES

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BACKGROUND AND OBJECTIVES
An in vitro digestion and fermentation model, designed to simulate human food digestion and colonic fermentation, enables the efficient prediction of the health effects of food consumption on the human body. Using this model, the impact of pulse and vegetable digestion on the human microbiome was assessed, and the implications of plant-based diets were examined from a microbiome perspective.

METHODS
The interactions between macronutrients (free sugars, free amino acids, and free fatty acids), the human gut microbial genus, and their metabolites (short-chain fatty acids) were comprehensively investigated for eight pulse and five vegetable species. The complete food digesta fermented for up to 24 h were anaylzed by 16S rRNA sequencing method for taxonomic profiling. Microbial diversity was measured by the calculation of α-diversity (Shannon index) and β-diversity (Bray-Curtis distance). Statistical methods including network analysis and linear regression analysis were employed to investigate the correlations between variables.

RESULTS
The relative abundance of gut health-detrimental genera represented by Escherichia-Shigella increased in kidney bean, soybean, cowpea, chickpea, and black bean samples. In contrast, the relative abundance of health-positive genera were elevated in red bean, mung bean, and Heunguseul, with the proportion of the pathogenic Escherichia-Shigella decreased. Concurrently, microbial diversity exclusively increased in these three species. In addition, despite the lower nutrient contents in the three pulses, network analysis revealed that the nutrient contents in the pulse digesta possess rich positive or negative correlations with a variety of bacteria, as well as their metabolites. The linear regression analysis demonstrated that the ratio of carbohydrates to fatty acids and amino acids to fatty acids displayed negative correlations with the diversity increase. When the model was applied using only vegetables, which contained minimal nutrients aside from a limited amount of free sugars, an increase in certain beneficial bacteria associated with dietary fiber was observed for some species. However, the overall microbial diversity decreased across all samples.

CONCLUSIONS
It is noteworthy that a diet comprising foods with a balanced nutritional profile supports the growth of beneficial gut microbes, thereby promoting microbial eubiosis. For a plant-based diet to be sustainable in terms of human health, it is suggested that a combination of dietary patterns that ensures nutritional balance is necessary.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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ANTIOXIDANT AND CHEMOPREVENTIVE ACTIVITY OF HYDRODISTILLATION WATER RESIDUES FROM CLOVE

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BACKGROUND AND OBJECTIVES
Clove is a spice used as a flavor in foods and a natural medicine mainly due to its rich essential oil. However, the potential beneficial effects of the clove aqueous extract are less noticeable. This study aims to investigate the antioxidant and chemopreventive effects of the water residues obtained after the clove essential oil hydrodistillation (WRHC).

METHODS
The total phenol and flavonoid contents were determined using the colorimetric method. The chemical profile was analyzed using liquid chromatography-tandem mass spectrometry (LC-MS/MS). Antioxidant activity was determined using DPPH radical scavenging assay. Cell migration and invasion were determined using wound healing and transwell assays. Protein disulfide isomerase (PDI) activity was determined using di-eosin-glutathione reduction assay.

RESULTS
Chemical analysis revealed that WRHC contained high levels of phenolic compounds and flavonoids that were correlated with its antioxidant activity. Pretreatment of human lung cancer A549 cells with low concentrations of WRHC (≤ 1 μg/mL) led to significant inhibition of cell migration and invasion. A mechanistic study revealed that WRHC inhibited the activity of PDI located on the cell surface that regulates functions of the integrins and, thus, the migration and invasion of cancer cells. In contrast, clove essential oil and eugenol, its major component, were ineffective in inhibiting PDI.

CONCLUSIONS
The antioxidant and chemopreventive effects of the hydrodistillation water residues from cloves may be beneficial in preventing lung cancer.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_171

UMBELLIFERONE MITIGATES DIABETIC MUSCLE ATROPHY BY REGULATING MITOCHONDRIAL DYNAMICS AND THE UBIQUITIN-PROTEASOME SYSTEM

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BACKGROUND AND OBJECTIVES
Diabetes mellitus is a prevalent metabolic disorder often associated with complications like diabetic sarcopenia, characterized by reduced muscle mass, strength, and function. A key feature of diabetic sarcopenia is mitochondrial dysfunction, disrupting cellular energy metabolism and quality control. Additionally, diabetes accelerates muscle protein degradation via the ubiquitin-proteasome system, leading to muscle atrophy. This study evaluated the potential of umbelliferone, a natural compound, to mitigate muscle atrophy in high-glucose-treated muscle cells and diabetic muscle tissues.

METHODS
C2C12 myoblasts were cultured in DMEM with 10% FBS and differentiated using 2% horse serum. Cells were exposed to high-glucose medium with 10–20 μM umbelliferone for 4 days. In parallel, db/db diabetic mice were administered 10 mg/kg umbelliferone orally for 8 weeks. Western blot analyses assessed muscle-related factors (MyoD, myogenin, MYH, SMM), mitochondrial biogenesis markers (SIRT1, AMPK, PGC-1α, FIS1, DRP1, MFN1, OPA1), and atrophy-related proteins (MuRF1, Atrogin-1). Muscle function was evaluated via grip strength tests.

RESULTS
High glucose reduced myogenesis-related factor expression in C2C12 cells and diabetic mouse muscles, which was restored by umbelliferone, along with improved grip strength. Umbelliferone increased mitochondrial biogenesis and fusion (MFN1, OPA1) while decreasing fission (FIS1, DRP1). It also downregulated atrophy-inducing proteins (MuRF1, Atrogin-1) and suppressed ubiquitin-proteasome activity.

CONCLUSIONS
Umbelliferone mitigated diabetic muscle dysfunction by enhancing myogenesis-related factors, regulating mitochondrial dynamics, and suppressing the ubiquitin-proteasome system, demonstrating its potential to alleviate diabetic sarcopenia.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_172

FLAVONOID PROFILING AND ANTIOXIDANT POTENTIAL OF OKRA (ABELMOSCHUS ESCULENTUS) GERMPLASM

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BACKGROUND AND OBJECTIVES
Okra (*Abelmoschus esculentus*), valued for its nutrition and climate adaptability, is a versatile vegetable crop. This study evaluated 220 okra germplasm accessions conserved by the National Agrobiodiversity Center of South Korea, focusing on flavonoid profiling, antioxidant potential, and agricultural traits. By quantifying two key flavonoid, quercetin-3-gentiobioside and isoquercetin, and analyzing their correlation with antioxidant activities, we aimed to explore okra's potential applications in food and nutrition sciences.

METHODS
Okra germplasm was cultivated under uniform conditions, and agricultural traits, including pod length, width, and weight, were measured. Flavonoids quercetin-3-gentiobioside and isoquercetin were quantified using ultra-performance liquid chromatography (UPLC). Antioxidant properties, including total phenolic content (TPC, mg gallic acid equivalents), total flavonoid content (TFC, mg quercetin equivalents), ABTS and DPPH radical scavenging activity (mg Trolox equivalents), and reducing power (mg L-ascorbic acid equivalents), were assessed on a dry weight (DW) basis.

RESULTS
Significant variability was observed in agricultural traits, with pod length ranging from 6.10 to 30.00 cm (mean: 14.30 ± 3.54 cm) and pod weight from 5.60 to 91.70 g (mean: 30.22 ± 12.79 g). Flavonoid quantification revealed that quercetin-3-gentiobioside and isoquercetin levels averaged 2.13 ± 0.879 mg/g DW and 0.86 ± 0.387 mg/g DW, respectively. TPC ranged from 0.57 to 6.49 mg GAE/g DW (mean: 3.25 ± 1.22 mg/g DW), while TFC ranged from 0.25 to 2.24 mg QE/g DW (mean: 0.94 ± 0.36 mg/g DW). Among antioxidant assays, ABTS demonstrated the highest activity (mean: 4.23 ± 0.87 mg TE/g DW), followed by DPPH (mean: 4.14 ± 1.95 mg TE/g DW) and reducing power (mean: 1.70 ± 0.69 mg L-AAE/g DW). Quercetin-3-gentiobioside and isoquercetin exhibited a strong correlation (r = 0.74) and were moderately correlated with TFC (r = 0.70, 0.67) and ABTS (r = 0.60, 0.60). These RESULTS suggest that quercetin-3-gentiobioside and isoquercetin significantly contribute to the antioxidant properties of okra.

CONCLUSIONS
The findings underscore the genetic and functional diversity of okra germplasm, emphasizing the pivotal role of quercetin glycosides in antioxidant potential. These RESULTS offer insights into okra's applications in breeding programs, functional food development, and food science, highlighting its dual value as an agricultural and nutritional resource.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_175

THE ANTI-OBESITY EFFECTS OF STICKY FOODS IN MICE FED WITH A HIGH FAT DIET

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BACKGROUND AND OBJECTIVES
It is well-known that obesity has a high prevalence worldwide, and also in Taiwan. In contrast, Japan has a low obesity rate, which may be linked to traditional dishes rich in soluble dietary fiber, such as seaweed and mushrooms with a sticky texture. In Taiwan, there are many local food ingredients with a sticky texture, similar to those in Japan. Therefore, the aim of this study was to investigate the anti-obesity effects of these local sticky foods (SF) in mice fed a high-fat diet.

METHODS
Twenty-eight 8-week-old C57BL/6 mice were used in this study. The mice were divided into four groups and fed different diets: control diet (AIN-93M) (C), 90% control diet and 10% SF (CSF), high-fat diet (60% of calories from fat) (H), or 90% high-fat diet and 10% SF (HSF). The SF was a mixture of various sticky ingredients, including seaweed, mushrooms, okra, and yam.

RESULTS
After 8 weeks of feeding, H group exhibited significantly higher body weight gain, food efficiency, relative adipose tissue weight, and alanine aminotransferase (ALT) activity compared to C group. The relative small intestine and colon lengths were significantly shorter in H group than in C group. However, HSF group showed significantly lower body weight gain, food efficiency, relative adipose tissue weight, and ALT activity compared to H group, while the relative small intestine and colon lengths were significantly longer.

CONCLUSIONS
In conclusion, the sticky food mixture demonstrated beneficial effects in reducing adipose tissue weight and body weight gain, as well as in prolonging the digestive tract.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_176

NUTRITIONAL CHARACTERISTICS OF WHEAT VARIETIES

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BACKGROUND AND OBJECTIVES

Georgia has a rich agricultural tradition, with 43.4% of its land used for agriculture. Wheat, an ancient crop in Georgia, includes 14 species and over 150 varieties. This research initiates Georgia's first database, "Chemical Content of Georgian Wheat Varieties," analyzing the nutrient content of 12 local wheat varieties. The findings will support nutrition studies, determine nutrient profiles, and contribute to dietary strategies based on actual data from Georgian wheat varieties.

METHODS

Wheat, a polyploid crop, is rich in carbohydrates, proteins, minerals, vitamins, and fiber, with local factors influencing its nutrient content. This study evaluated the chemical content of 139 nutrients across 12 Georgian wheat varieties, analyzing over 1,529 chemical indicators. The wheat samples were tested in internationally accredited laboratories, and the RESULTS were calculated considering EFSA Intake Reference Values and the coefficient of nutrient transition into food. The assessment focuses on diet balance, highlighting the role of Georgian wheat in providing essential nutrients like proteins, amino acids, carbohydrates, fats, vitamins, and minerals for health and well-being.

RESULTS

In this study, Georgian wheat samples were examined for crude protein and 19 amino acids, providing insights into their nutritional composition. The RESULTS showed that the crude protein content was high, with several samples exhibiting significantly elevated levels of essential amino acids compared to other varieties. Additionally, the levels of conditionally essential amino acids were notably higher. Gluten index and wet gluten content were on the lower end. However, dietary fiber content was found to be higher than in many other wheat varieties, indicating potential benefits for digestive health. Regarding fatty acids, the Georgian wheat samples contained higher levels of monounsaturated and polyunsaturated fatty acids (MUFAs and PUFAs), while saturated fatty acids were lower. Several wheat varieties were also rich in vitamins and minerals, including vitamin B9, niacin, vitamin E, copper, zinc, and iron, contributing significantly to daily nutritional requirements and highlighting their potential role in supporting a balanced diet.

CONCLUSIONS

Wheat and wheat-based products play a crucial role in providing essential nutrients and energy in a balanced diet. This study highlights the significant potential of Georgian wheat endemic varieties in providing essential nutrients. As a pioneering effort, it underscores the need for further research to assess nutrient content in flour and baked products.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_177

POLYPHENOL-MEDIATED EPIGENETIC REMODELLING IN LIPOTOXICITY-CHALLENGED HUMAN MAMMARY EPITHELIAL CELLS

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BACKGROUND AND OBJECTIVES

Adiposity and dysregulation of lipid metabolism, signified by elevated plasma free fatty acids, are known risk factors for breast diseases, including breast cancer (1). Epigenetics plays important regulatory roles in breast health (2), which refers to transcriptional regulations of gene expression without altering the DNA sequence, e.g., DNA methylation and histone modifications (3). Our previous studies show that pterostilbene (PTS), a dietary polyphenol from berries, impacts histone methylation (H3K36me3) at specific gene loci in breast cancer cells, regulating expression of oncogenes (4). However, the epigenetic effects of PTS on preventing disruptions of homeostasis in the healthy mammary epithelial cells remain to be investigated. Considering *in vivo* relevance of microbial metabolism, pinostilbene (PNS), the major colonic metabolite of PTS (5), is of high interest. PNS exhibits similar antioxidant and anti-inflammatory activities as PTS (6), however its epigenetic effects remain unknown. This study aims to explore PTS and PNS effects on the fatty acids (FA)-challenged mammary epithelial cells, focusing on epigenetic regulation of gene expression.

METHODS

Human mammary epithelial cells (MCF10A) were treated with FA for 48 h to induce lipotoxicity, followed by a 72h treatment with PTS or PNS. Cell growth and viability were analyzed with Acridine Orange/Propidium Iodine (AO/PI) staining, and cellular fatty acid accumulation with Oil Red O (ORO) staining. Genome-wide H3K36me3 occupancy and gene expression are being determined with chromatin immunoprecipitation sequencing (ChIP-seq) and RNA sequencing (RNA-seq), respectively.

RESULTS

FA treatment inhibited cell growth and viability dose-dependently, and the concentration that reduced the viable cell number to 50% of non-FA treated control cells (IC50) was established at 380 μM, with 2:1 molarity ratio of oleic and palmitic acids. Cellular uptake of FA, as indicated by intracellular lipid accumulation with ORO staining, was positively correlated with FA concentration. The IC50 of PTS was established at 5 μM in FA-challenged MCF10A cells, which was comparable to the IC50 of 6 μM in non-FA treated control cells. PTS treatment at 5 μM had no cytotoxic effects and significantly reduced intracellular lipid accumulation in FA-challenged cells. The dose-response of PNS is under investigation.

CONCLUSIONS

PTS effectively mitigated FA-induced intracellular lipid accumulation to protect the cells against lipotoxicity. The PTS-mediated epigenetic dynamics underlying the protective effect will be revealed with ongoing ChIP-seq and RNA-seq analyses.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_178

IDENTIFICATION OF A-SYNUCLEIN AMYLOID FORMATION INHIBITORS IN MAITAKE EXTRACTS

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BACKGROUND AND OBJECTIVES

Parkinson's disease is caused by the aggregation and accumulation of α-synuclein (α-SN) in neuronal cells. Since maitake hot water extract (MHW) exhibits strong inhibitory effects on α-SN amyloid formation, this study aimed to identify the inhibitory substances within maitake extracts.

METHODS

MHW Preparation: Hot water extraction was performed using freeze-dried and ground maitake (M).Molecular Weight Fractionation (MWCO): MHW was fractionated using a 106–104 MWCO membrane. Maitake Ethanol Extraction (ME): Ethanol extraction was performed using M.Maitake Crude Polysaccharide Extraction (MCP): M was mixed with water, heated at 121°C, and precipitated using ethanol.To assess α-SN amyloid formation inhibition, each of the extracts (1–4) was added to non-amyloidized α-SN at a $1/10^3$ (v/v) dilution. After shaking at 37°C for 72 hours, Thioflavin T (ThT) fluorescence was measured. The α-SN fibrillization rate (AR) was calculated by normalizing the fluorescence intensity of untreated samples at 72 hours to 100%.

RESULTS

MHW: AR was 0%, indicating complete inhibition of amyloid formation. MWCO: Fractions above 106 MWCO showed an AR of 90%, demonstrating weak inhibition of amyloid formation. Fractions below 106 MWCO showed AR values comparable to MHW, effectively inhibiting amyloid formation. ME: AR values for ME with ethanol concentrations of 0–50% were similar to MHW, indicating inhibition of amyloid formation. However, AR increased in an ethanol concentration-dependent manner for ME with ethanol concentrations ≥60%. MCP: AR was 50%, significantly lower than untreated samples but significantly higher than MHW.

CONCLUSIONS

The inhibitory substances in maitake for α-SN amyloid formation are estimated to have a molecular weight below 106 MWCO and are not extracted under high ethanol conditions. Adding crude polysaccharides from maitake resulted in a 50% inhibition of amyloid formation, suggesting that polysaccharides are one of the inhibitory substances. However, the substances responsible for the remaining 50% inhibition have yet to be identified.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_179

MATCHA GREEN TEA IMPROVES LIPID METABOLISM DISORDER AND GUT DYSBIOSIS IN CAFETERIA DIET-INDUCED NAFLD IN A RAT MODEL

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BACKGROUND AND OBJECTIVES
Non-alcoholic fatty liver disease (NAFLD) becomes the most common chronic liver condition in the world. In animal model, cafeteria diet used to induce NAFLD by adding high-fat, high- sugar, and high-salt human snacks and processed foods to the animal-based feeds. Matcha is a processed green tea that contains higher levels of caffeine and catechins. Research about the effects of matcha on lipid metabolism and gut microbiota in NAFLD still limited. Therefore, this study aims to investigate the effects of matcha on lipid metabolism and gut microbiota in NAFLD by cafeteria diet fed rats.

METHODS
Forty-eight 7-week-old male Wistar rats were divided into six groups (n = 8), including a control group (C)(normal diet, LabDiet 5001), C+0.2% matcha group (C+0.2%), C+1% matcha group (C+1%), cafeteria group (Caf)(including cheese sandwich crackers, milk puffs, chips, sausages and LabDiet 5001), Caf+0.2% matcha group (Caf+0.2%), and Caf+1% matcha group (Caf+1%). All rats were sacrificed after 12 weeks.

RESULTS
The RESULTS indicated that liver total cholesterol (TC) and liver triglycerides (TG) concentrations had significantly increased in the Caf group when compared to C group, and the 0.2% matcha intervention improved this phenomenon. Hepatic H&E staining showed that matcha improved the steatosis and inflammation under cafeteria diet feeding. The steatosis score, inflammation score, and NAFLD score of the Caf group had significantly increased compared to those of the C group. On the other hand, steatosis scores of the Caf+0.2% and Caf+1% groups had significantly decreased compared to that of the Caf group. Besides, 12-week cafeteria diet feeding disrupted gut microbiota composition while a significant increase in *Akkermansiaceae* and *Akkermansia* (AKK) in the Caf+0.2% group was found. Additionally, in the Caf+1% group, a significant increase of *Parabacteroides* and *Faecalibacterium* were observed.

CONCLUSIONS
In conclusion, matcha showed the potential for improving lipid metabolism disorder and gut dysbiosis in cafeteria diet-induced NAFLD model.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_180

THE IMPACT OF SUPPLEMENTATION WITH KRILL OIL DURING DIET-INDUCED BODY MASS LOSS AND BODY WEIGHT MAINTENANCE PHASES ON BODY COMPOSITION AND SUBJECTIVE APPETITE

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BACKGROUND AND OBJECTIVES
Supplementation with long-chain n-3 polyunsaturated fatty acids (LCn-3 PUFA) is associated with appetite reduction [1, 2]. We investigated the impact of krill oil (KO), as a source of LCn-3 PUFA supplement, on changes in body composition, subjective appetite, and gastrointestinal appetite hormones during body weight loss and weight maintenance phases.

METHODS
Twenty-eight adults (mean age: 39.4±11.7 years; BMI: 27.9±3.2 kg/m²) participated in a double-blind, randomised, placebo-controlled trial. Participants consumed either 4g/day of KO or 4 g/day of vegetable oil (placebo) during the 4-week preparation phase, the 8-week alternate-day fasting phase, and the subsequent 8-week body weight maintenance phase. Body mass, body fat and fat-free mass were measured before, and after weight loss and weight maintenance phases. Fasting and postprandial subjective appetite scores and plasma concentrations of acylated ghrelin, GLP-1, and PYY were measured before and after the weight loss phase. A two-way ANOVA with repeated measures assessed the impact of time, group, and time*group interaction effects.

RESULTS
Body weight was reduced by -4.6±1.4 kg and -4.5±1.9 kg in the KO and placebo groups, respectively. The ANOVA revealed a significant time ($p<0.05$), but not group ($p>0.05$) or time*group interaction ($p>0.05$) effects for body mass, fat mass or FFM during the weight loss phase. During the weight maintenance phase, no significant time, group, or time*group interaction effects were found for body mass and FFM (all $p>0.05$), while for fat mass, the time*group interaction effect was significant ($p<0.05$). During the maintenance phase, in the KO group fat mass remained unchanged (+0.1±0.3 kg, $p>0.05$), but increased significantly in the placebo group (+0.4±0.3 kg, $p< 0.05$). This coincided with a significant reduction in the composite appetite score (CAS) in the KO group (-6.6 ±7.4 mm, $p<0.05$) but not in the placebo group (-3.7 ±8.3 mm, $p> 0.05$) during the body weight loss phase. There were no significant time, group, or time*group interaction effects for acylated ghrelin, GLP-1, and PYY during the weight loss phase (all $p > 0.05$).

CONCLUSIONS
KO supplementation during diet-induced weight loss may induce favourable changes in subjective appetite and prevent short-term fat mass regain.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_181

CLASSIFICATION OF SCHOOL MENUS IN BRAZIL USING GENERATIVE AI

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BACKGROUND AND OBJECTIVES

The Revised Quality Index for School Meal Menus (IQCAE-R) is one of the few existing frameworks designed to assess the nutritional quality of school meal menus [1]. It assigns positive scores to healthy foods such as fruits and vegetables and negative scores to sweets and ultra-processed foods. It also takes regional ingredients and healthy practices into account. Developing an application that automatically calculates the IQCAE-R offers several benefits. By utilizing generative artificial intelligence based on Large Language Models (LLMs) [2], and advanced techniques, including GraphRAG [3] and Hybrid Retrieval [4], it is possible to perform a contextualized and efficient analysis of menus and classify them according to the IQCAE-R.

METHODS

A Knowledge Graph [5] is developed in Neo4j, encompassing entities such as foods and food groups, along with their attributes (e.g., name, category, and embeddings [6]. Python integration facilitates the use of the Neo4j-Graphrag library for communication with the LLM and hybrid data retrieval. The Extract-Transform-Load (ETL) process [7], organizes data for analysis, leveraging embeddings from OpenAI's text-embedding-3-large model to ensure precise identification and classification. By accurately recognizing and classifying food items in daily school menus, the system calculates the IQCAE-R for weekly menus.

RESULTS

The project introduces an innovative system that processes weekly school menus to identify food items and evaluate their nutritional dimensions, enabling automated IQCAE-R calculation. By integrating GraphRAG and Hybrid Retrieval techniques with Neo4j, the system uncovers complex relationships between food items and nutritional components. This automation improves classification accuracy and ensures compliance with IQCAE-R guidelines, fostering healthier eating practices in Brazil’s public schools.

CONCLUSIONS

This project proposes a groundbreaking, automated approach to calculate the IQCAE-R for school meal menus, addressing the current gap in systematic nutritional analysis. By employing GraphRAG techniques, Hybrid Retrieval, and the Neo4j graph database, the system utilizes generative artificial intelligence to identify, classify, and score food items according to IQCAE-R criteria. This solution enhances efficiency in index generation and represents a technological leap forward in optimizing school food management.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_183

CAGRISEMA IMPROVES INSULIN SENSITIVITY IN DIET-INDUCED OBESE RATS

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BACKGROUND AND OBJECTIVES
CagriSema (CS), a combination of the long-acting analogues of amylin (cagrilintide) and glucagon-like peptide-1 (semaglutide), is in clinical development for treatment of obesity. It is unknown whether CS leads to improvement of insulin sensitivity. The aim of this study was to investigate changes in insulin sensitivity with CS in diet-induced obese (DIO) rats.

METHODS
DIO male rats were allocated to three groups (n=6 per group): vehicle control (VC), CS and a vehicle group that was weight-matched (WM) to CS by calorie restriction. The groups were stratified by body weight (BW), fat mass and fat-free mass. The rats received daily s.c. doses of either 2 nmol/kg CS or vehicle, and food availability in the WM group was adjusted daily to achieve similar weight loss as in the CS group. After 21 days of treatment, rats were instrumented under general anaesthesia (isoflurane) with carotid and jugular catheters for sampling and infusions, respectively. After 9–11 days of recovery, rats were subjected to a 180-minute hyperinsulinaemic (15 pmol/kg/min) and euglycaemic (~5.7 mM) clamp. 3H-glucose and 14C-2-deoxy-glucose (2DG) were used to measure hepatic glucose production (HGP), glucose uptake (GU) and tissue-specific 2DG uptake.

RESULTS
CS-treated rats and WM treated rats lost ~10% BW (baseline-adjusted). Inducing a comparable BW loss between WM rats and CS rats required a supply of ~10% less food (accumulated) to the WM rats, suggesting an additional effect by CS in metabolic adaptation. FI in CS and WM groups returned to baseline levels at the end of treatment without an increase in BW. No change in fasting plasma glucose was observed between groups, but baseline plasma insulin decreased by 40% with CS compared with VC ($p<0.03$) suggesting an increase in insulin sensitivity. Compared with the VC group, clamp glucose infusion rates (GIR) increased by 4.2- and 2.6-fold in the CS ($p<0.001$) and WM ($p=0.097$) groups, respectively. No significant differences in HGP between groups, but compared with VC group, GU increased by 3.3- and 1.6-fold in CS ($p=0.002$) and WM (NS) groups, respectively. To further explore the GU in specific tissues, 2DG uptake in muscle and fat was evaluated and found to be higher in muscle (but not in fat) in CS group compared to VC group.

CONCLUSIONS
Treatment with CS increased insulin sensitivity and improved glucose metabolism compared with VC in DIO rats. This improvement in insulin sensitivity could only partly be explained by weight loss as the GIR was numerically, but not significantly (65%, $p=0.079$), larger in the CS group compared to the WM group.

CONFLICTS OF INTERESTS
Anna Secher: Novo Nordisk employeeChristian L Brand: Novo Nordisk employeeKirsten Raun: Novo Nordisk employeeVanessa Folope Leborgne: Novo Nordisk employee

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EPO8_185

EFFECT OF MANGANESE OVERLOAD ON ZIP8 EXPRESSION IN NEONATAL MOUSE LIVER

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BACKGROUND AND OBJECTIVES
ZIP8 (SLC39A8) is a membrane metal transporter that mediates the transport of divalent cations, especially manganese (Mn), essential for various enzymatic activities in metabolic processes. This study investigates the effects of maternal dietary manganese content on ZIP8 expression in liver, lung, kidney, and spleen of neonatal mice, aiming to understand how manganese overload affects ZIP8-mediated homeostasis and tissue distribution.

METHODS
Neonatal mice models were generated from 8-9 week old wild-type breeding pairs, divided into two dietary groups: a control group fed with a 20 ppm Mn diet and a Mn-overload group fed with a 2000 ppm Mn diet. The breeding pairs were maintained on these diets throughout breeding and lactation to modify maternal breast milk Mn content. ZIP8 expression in the liver, lung, kidney, and spleen of the offspring was quantified using Western blot analysis.

RESULTS
Significant decreases in hepatic ZIP8 expression were observed in both male and female neonates from the Mn-overload diet group, suggesting reduced Mn reabsorption from bile and potentially increased Mn excretion. In contrast, ZIP8 expression in the lung, kidney, and spleen showed no significant differences between the dietary groups, indicating a tissue-specific response to dietary manganese overload.

CONCLUSIONS
The findings highlight the liver as a critical site for ZIP8 regulation in response to dietary Mn changes. The decreased expression of ZIP8 in the liver under Mn overload conditions suggests a protective mechanism against Mn toxicity, possibly by reducing Mn reabsorption and increasing excretion. This study underscores the importance of ZIP8 in maintaining Mn homeostasis and suggests potential implications for managing conditions associated with Mn dysregulation. Further research is needed to explore the mechanisms of ZIP8 regulation in other tissues and under different dietary conditions.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_186

ASSESSING THE EVIDENCE: A CRITICAL REVIEW OF NUTRITIONAL REQUIREMENTS VALUES AND INTAKE RECOMMENDATIONS

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BACKGROUND AND OBJECTIVES
Nutrient requirement values established by large-scale committees like WHO1, EFSA2 and IOM3 provide the foundation for nutrient intake recommendations, global assessments of inadequate nutrient intake, and public health strategies to address nutrient deficiencies. However, the reliability and generalisability of these requirement values have not been systematically examined. To address this gap, we critically reviewed the quality of evidence base used to establish requirements by these committees.

METHODS
We examined the methodological approaches used by EFSA and IOM to set average requirements (AR) and adequate intakes (AI) for 20 micronutrients across various life stages: adults, infants, children, and pregnant and lactating women. For each nutrient and age group, we reviewed the characteristics of evidence used by these committees, including the number of studies, study demographics, and publication timelines.

RESULTS
For adults, ARs for 10 nutrients were based on experimental studies establishing clear relationships between intake and health endpoints. Fewer than 5 experimental studies, typically published between the 1950s-2000s and featuring small sample sizes (7 to 50 participants), were used for most of these nutrients. For other nutrients, ARs or AIs were derived from less robust alternative approaches, including short-term balance studies, factorial analyses, and observed intakes from healthy populations in national dietary surveys, none of which clearly reflect the effect of nutrients on health. For infants and lactating women, ARs or AIs for most nutrients were based on breastmilk nutrient concentrations typically derived from fewer than 10 observational studies involving a range of participants (7 to 600 postpartum women), which were published between the 1970s-2010s. For children and pregnant women, ARs or AIs were often extrapolated from other age groups.

CONCLUSIONS
Evidence used by EFSA and IOM to derive nutrient requirements is limited and outdated for nearly all micronutrients. Urgent efforts are needed for more robust, and contemporary evidence to ensure nutrient requirement values are reliable, equitable, and reflective of global health needs.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_187

CORRELATION OF NUTRITIONAL STATUS AND HEMOGLOBIN LEVEL AMONG ADOLESCENT-SCHOOL GIRLS IN SUB-URBAN OF WEST JAVA, INDONESIA

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BACKGROUND AND OBJECTIVES
Anemia, a condition characterized by a reduced number of red blood cells or hemoglobin, is a significant public health concern, particularly among adolescent girls. Adolescence is a crucial developmental phase, and anemia during this time can have severe consequences, including increased risk of foetal morbidity and mortality in the future..The current study aims to investigate the correlation between nutritional status and hemoglobin levels among adolescent-school girls in West Java, Indonesia. The research will enrich the study of public health problems in low- and middle-income countries.

METHODS
This cross-sectional study was conducted among 311 adolescent-school girls in West Java, Indonesia. Data on demographic characteristics, nutritional status, and hemoglobin levels were collected through a structured questionnaire and laboratory analysis. Nutritional status was assessed using body mass index, and hemoglobin levels were measured using a standard hemoglobin testing method. Pearson correlation analysis was used to examine the relationship between nutritional status and hemoglobin levels.

RESULTS
The study included 311 adolescent-school girls with a median age ± SE of 17 ± 0.04 years. The prevalence of moederate anemia was 24.4%, while the prevalence of mild anemia was 16.4% for a hemoglobin level between 11 and 11.9 g/dL rather than 12 g/dL. The prevalence of underweight, normal, and overweight was 29.6%, 54%, and 16.4%, respectively. There is no significant correlation observed between nutritional status and hemoglobin levels ($r = 0.038$, $p > 0.05$), indicating that nutritional status is not correlated with hemoglobin level for this particular population. Further study is required to investigate the possible factors affecting the hemoglobin level of the adolescent-school girls in the sub-urban area.

CONCLUSIONS
Targeted interventions aimed at improving the nutritional status of this population may be an effective approach to reducing the burden of anemia.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_192

BETA-CRYPTOXANTHINE AND VITAMIN C CONTENT IN MOMORDICA CHARANTIA L

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BACKGROUND AND OBJECTIVES

Momordica charantia has been used as a vegetable in Okinawa, a southern region of Japan, Southeast Asia, and the Pacific islands. With global warming, it is also being cultivated in Hokkaido, a northern region of Japan. Vitamin C and β-carotene have been focused of attention as nutritional components of Momordica charantia[1],[2]. In this study, we report on β-cryptoxanthin contained in ripe Momordica charantia fruits.

METHODS

A single seedling of Momordica charantia was planted in a planter filled with soil on the balcony of an apartment building. Samples were considered fully ripe when more than half of the fruit had turned yellow and was about to split, or when the fruit had started to split at the time of harvest. Samples that were more than half green at the time of harvest were considered semi-ripe. As a control, fruits that were entirely green three weeks after flowering (pollination) were considered mature-green fruit. We requested the Japan Food Research Center to measure the β-cryptoxanthin and Vitamin C content in the same samples.

RESULTS

The β-cryptoxanthin content of mature-green fruit of Momordica charantia was 6μg/100g. The β-cryptoxanthin content of semi-ripe fruit was 154-267μg/100g, while that of fully ripe fruit was 950-2230μg/100g. The Vitamin C content of semi-ripe and fully ripe were lower level than mature-green fruit.

CONCLUSIONS

The β-cryptoxanthin content of Momordica charantia, which was 6μg/100g in mature-green fruit, was observed to increase with ripeness. When approximately 50% or more of the fruit had turned yellow, no difference was observed between approximately 50% turned yellow fruit and almost 100% turned yellow fruit. The Vitamin C content was decreased as days pass after pollination, and it showed a similar result as the other reports[1],[2]. It is said that fully ripe fruit has low nutritional value and is not tasty, but considering the high β-cryptoxanthin content, it cannot be said that it has low nutritional value.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_193

Role of methylxanthines in the modulation of age-associated intestinal barrier dysfunction: RESULTS from an in vitro study

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BACKGROUND AND OBJECTIVES

We recently documented that an 8-week intervention with a (poly)phenol-rich diet reduced serum zonulin and calprotectin levels, as markers of intestinal permeability (IP) and inflammation, in older adults (1-2). In addition, we found an inverse association between serum methylxanthines (MX), derivatives from cocoa and/or green tea intake, with serum zonulin levels (3). The aim of this study was to test the hypothesis that MX may play a role in the modulation of barrier function in an in vitro model of intestinal epithelial cells. This study was carried out in parallel with the activities of the OnFoods project (https://onfoods.it/).

METHODS

Colorectal adenocarcinoma cells (Caco-2) were differentiated into polarized monolayers, pre-treated with D-galactose (30 g/L) for 24 h, in order to induce age-associated intestinal barrier dysfunction, and incubated with 3-Methylxanthine and 7-Methylxanthine (1.25-20 µM) for additional 24 h. The transepithelial electrical resistance (TEER) and fluorescein isothiocyanate-dextran (FITC-D) efflux assays were used to measure the integrity of the intestinal monolayer. Additionally, the regulation of intestinal barrier markers including occludin, zonulin and p53 was evaluated by ELISA kits.

RESULTS

D-Gal treatment significantly elevated zonulin levels (at about +140% fold change compared to the control, $p<0.05$) but not p53 levels (+19% fold change, $p>0.05$). The administration of physiological concentrations of MX mitigated D-Gal-induced intestinal barrier dysfunction, as documented by a significant increase in TEER and a significant reduction in FITC-d values and zonulin production. No effect on p53 and occludin levels was observed.

CONCLUSIONS

The findings suggest a potential contribution of MX in the modulation of IP thus, supporting the correlation found within the human trial. These RESULTS could represent an important starting point for in vivo studies focused on the demonstration of a beneficial effect of MX and/or related food sources in the context of IP conditions.

CONFLICTS OF INTERESTS

The authors have no conflict of interest.

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EPO8_194

IDENTIFICATION OF NOVEL ANTI-TUMOR PEPTIDES FROM SOY-BASED TEMPEH AND THEIR MECHANISM IN PANCREATIC AND COLORECTAL CANCER CELLS

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BACKGROUND AND OBJECTIVES
Pancreatic and colorectal cancers are among the most aggressive and prevalent cancers worldwide, with limited treatment efficacy and severe side effects. Functional foods, such as soy-based tempeh, have shown potential anticancer properties. This study aimed to identify bioactive peptides from soy-based tempeh hydrolysate (SBTE) and evaluate their antitumor potential through bioinformatics and in vitro analysis.

METHODS
SBTE was prepared by enzymatic hydrolysis using trypsin, followed by untargeted metabolomic profiling via liquid chromatography-mass spectrometry (LC-MS/MS) to identify peptide sequences. Bioinformatic analysis, including network pharmacology and molecular docking, was conducted to determine interactions with cancer-related receptors such as EGFR, iNOS, BIRC2, ANPEP, and PARP1. In vitro studies using HT-29 (colorectal) and PANC-1 (pancreatic) cancer cell lines assessed the cytotoxic effects and downregulation of cancer-related receptor expressions.

RESULTS
A novel peptide, P1 (GENEEEDSGAIVTVK), and four dipeptides (Ile-Arg, Lys-Pro, Gly-Leu, Lys-Leu) were identified from SBTE. Molecular docking analysis revealed strong binding affinities to cancer receptors, with the highest affinity observed for PARP1 (-6.5 kcal/mol) and EGFR (-6.2 kcal/mol). In vitro experiments demonstrated a significant reduction in the expression of cancer-related receptors, with a 10-fold downregulation in PANC-1 and HT-29 cells. The SBTE and its peptides exhibited selective cytotoxicity, with LD50 values significantly lower in cancer cells compared to normal cells.

CONCLUSIONS
SBTE and its bioactive peptides demonstrate promising anticancer potential through targeted receptor downregulation and selective cytotoxicity, making them potential candidates for functional food development or novel anticancer therapies against pancreatic and colorectal cancers.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_195

COMPARATIVE STUDY OF NUTRITIONAL STATUS IN PRESCHOOL CHILDREN: A CASE STUDY OF MONGOLIA AND SWITZERLAND

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BACKGROUND AND OBJECTIVES
Proper nutrition plays a fundamental role in children's growth and health, particularly during the preschool years, a critical period for establishing dietary habits. This study aims to compare the nutritional quality of preschool meals, dietary patterns, and food supply systems between Mongolia and Switzerland to identify key factors influencing child nutrition and health outcomes.

METHODS
The study was conducted between November 2022 and April 2023, involving 306 children aged 3–6 years from preschools in Ulaanbaatar, Mongolia, and Lausanne, Switzerland. Data were collected using food frequency questionnaires, 24-hour dietary recall methods, and on-site analysis of preschool meal production and food supply systems. Nutrient intake was assessed using national and international dietary guidelines. Statistical analyses were performed using SPSS and NutriSurvey software.

RESULTS
Significant differences in nutritional intake and dietary practices were observed. Mongolian preschool meals contained excessive protein (+16.3%) but insufficient fat (-20.5%), while Swiss meals showed excess fat (+36.8%) and inadequate protein (-16.9%) and carbohydrates (-29.2%). Mongolian children consumed less fruits and vegetables but more sugary snacks and beverages compared to Swiss children. Additionally, the absence of nutritionists in meal planning and systemic differences in food supply practices were identified as contributing factors.

CONCLUSIONS
The study highlights the need for tailored interventions to improve preschool nutrition programs, including employing nutritionists, enhancing parent education, and implementing sustainable food policies. Lessons from Switzerland's standardized food regulations and environmental sustainability approaches could serve as a model for Mongolia to address its nutritional challenges and promote healthier childhood development.

CONFLICTS OF INTERESTS
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EPO8_196

ESTABLISHING A COMMUNITY ADVISORY BOARD FOR A NUTRITION CLINICAL TRIAL; STRATEGY AND PROCESS

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BACKGROUND AND OBJECTIVES

Community advisory boards (CABs) are crucial organs for involving communities in research. Although CABs have been commonly used in HIV-related clinical trials, their use in other fields, such as nutrition, is less well-documented. Prior to implementation of a nutrition trial within the community to establish optimal dosage of multiple micronutrient supplementation (MMS) for women of reproductive age (WRA), the trial team established a CAB. The CAB was set up to foster trust and address potential challenges or rumors that could potentially arise from implementation of a nutrition clinical trial within the community

METHODS

The process of setting up a CAB began with stakeholder consultations with the local administrative leaders, research institution's community representatives and leaders from organized community groups. Additionally, the research institution's community engagement team were also consulted. The consultation process aimed to gather diverse views on the process of setting up the CAB. The CAB was to include representation from women, men, youth, people with disabilities, health leaders and local administrative leaders from the study community. Potential CAB members were to be identified and endorsed by the community members in an open-air community gathering organized by the local administration. Finally, a 5-day training was to be conducted to equip the CAB members with knowledge on the research institution activities, research ethics, trial processes and their roles as CAB members.

RESULTS

The diverse consultation resulted in a document outlining a standard operating procedure (SOP) for setting up a CAB within a research institution. Two separate CABs were set up at the two trial sites each with 12 members, totaling 24 members across both sites. The composition of the CABs ensured gender balance (12 males; 12 females) and included various community leaders and representatives from different groupings within the community.

CONCLUSIONS

The successful establishment of the CAB corresponded to an integrated approach that involved engaging multiple stakeholders, such as local administrative leaders, existing community groups, and the research institution's community representatives. The experience gained by the community engagement team was essential to the process, helping to ensure the CAB's effective setup and functioning. The standard operating procedures are an institutional resource for future use.

CONFLICTS OF INTERESTS

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EPO8_199

BASIL ESSENTIAL OIL AND ABIETIC ACID: SYNERGISTIC ANTIBACTERIAL AND ANTIBIOFILM EFFECTS AGAINST VAGINAL PATHOGENS

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BACKGROUND AND OBJECTIVES
Vaginitis is a common gynecological condition caused by bacterial infections. The vagina's environment is susceptible to microbial overgrowth, leading to various types of vaginitis. Basil (*Ocimum basilicum* L.) essential oil and abietic acid have demonstrated antibacterial and antiinflammatory effects. Combining these two natural compounds presents a promising synergistic approach to inhibit vaginal pathogens. This study evaluated their combined antibacterial effects using the Checkerboard dilution method to determine the fractional inhibitory concentration index (FICI). This research aims to contribute to the development of novel feminine hygiene products for the prevention and treatment of vaginitis.

METHODS
Basil essential oil was extracted via steam distillation. Abietic acid was purified from rosin. The Checkerboard dilution method was employed to analyze the combined antibacterial effects of these compounds against vaginal pathogens and to determine the FICI. Antibacterial activity was evaluated through broth microdilution assays. Biofilm formation was assessed using crystal violet staining, and the expression of virulence factor genes was analyzed via quantitative PCR. Additionally, the effects of the optimal mixture on the growth of *lactobacilli* were examined.

RESULTS
Both basil essential oil and abietic acid exhibited potent antibacterial activity against four vaginal pathogens at low concentrations. Their combination demonstrated significant synergistic effects against all tested pathogens, with the strongest effect observed against *Candida albicans*. This synergy effectively inhibited biofilm formation and modulated virulence factor genes expression. Importantly, this combination did not adversely affect the growth of *lactobacilli*, supporting its potential safety in vaginal applications.

CONCLUSIONS
This study highlights the potent synergistic antibacterial and antibiofilm effects of basil essential oil and abietic acid against vaginal pathogens, especially *C. albicans*. These findings suggest a promising natural alternative for preventing and treating vaginitis.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_200

INTESTINAL ABSORPTION OF C- AND O-GLUCOSIDES OF APIGENIN AND LUTEOLIN IN THORACIC-LYMPH CANNULATED RATS

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BACKGROUND AND OBJECTIVES
Flavonoids are major functional components and found mainly in various glycosidic forms in plant foods. The type of sugar moieties bound to one or more hydroxy groups or carbons (*O*-glycoside or *C*-glycoside) strongly affect their bioavailability. In this study, we compared the intestinal absorption of major flavones, apigenin and luteolin, focusing on the chemical forms of their aglycones and monoglucosides.

METHODS
Apigenin and luteolin were administered intraduodenally as their aglycones or monoglucosides (*O*- and *C*-linkages) to rats with thoracic lymph duct cannulation. Lymph fluid, peripheral blood, urine, and feces were collected for 6 h (aglycones and *O*-glucosides) or 12 h (C-glucosides). The samples were treated with β-glucuronidase/sulfatase and subjected to quantitative analysis by HPLC-PDA. The untreated samples were partly analyzed by LC-MS/MS to identify their metabolites.

RESULTS
When apigenin was administered to lymph-cannulated rats, the plasma and lymphatic levels after *O*-glucoside administration were significantly higher than those of aglycone administration. In the case of luteolin, its aglycone and *O*-glucoside showed similar absorbability. Interestingly, luteolin was transported to the lymphatic system at higher levels than apigenin. After administration of *C*-glucosides of apigenin and luteolin, their aglycones were not detected either with or without deconjugation in the plasma and lymph at an early phase, indicating that *C*-glycosidic linkage cannot be cleaved at the intestinal mucosa. Instead, the intact C-glucosides were detected at lower levels both in the plasma and lymph to a similar extent. In the urine, apigenin *C*-glucoside were detected at a higher level than luteolin *C*-glucoside. LC-MS/MS analysis indicated that the part of *C*-glucosides appeared in the plasma, lymph and urine as their sulfates. On the other hand, the conjugated aglycones and their derivatives were detected in the feces with the parent *C*-glucosides. These observations suggest the degradation of *C*-glucosides by intestinal microbiota.

CONCLUSIONS
The modification of *O*-monoglucoside did not change the lymphatic transport ratio of flavones but enhanced the apigenin absorption. Also, *C*-monoglucosides can be absorbed intact as well as their conjugated forms and the corresponding aglycone at a late phase. These RESULTS will be helpful to understand the distinguished benefits in various plant foods.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_201

PREVENTION OF INTESTINAL INFLAMMATION BY HUMAN BREAST MILK-DERIVED EXTRACELLULAR VESICLES IN A DSS-INDUCED MOUSE MODEL OF INFLAMMATORY BOWEL DISEASE

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BACKGROUND AND OBJECTIVES
Inflammatory bowel disease (IBD) is a chronic condition characterized by persistent inflammation of the intestines. Current treatments, including immunosuppressants and biologics, often come with side effects and limited long-term efficacy. Consequently, there is an urgent need for innovative therapeutic strategies. Extracellular vesicles (EVs), small vesicles crucial for intercellular communication, have shown potential in treating various diseases. Notably, EVs derived from human breast milk modulate immune responses, reduce inflammation, and promote tissue repair, positioning them as a promising candidate for restoring gut homeostasis in IBD.

METHODS
Sample collection was approved by the Bioethics Committee of the Human-derived Materials Research Institute. EVs derived from human breast milk were isolated and characterized using ultracentrifugation. IBD was induced in mice using dextran sulfate sodium (DSS), followed by oral administration of these EVs for treatment. The effects on intestinal damage and inflammation were evaluated by analyzing blood, small intestine, large intestine, and liver samples, focusing on the impact of EV treatment on intestinal injury and inflammation.

RESULTS
EVs derived from human breast milk significantly reduced inflammation and facilitated tissue repair in both the small and large intestines of IBD model mice. These EVs also contained immunoglobulins that suppressed pro-inflammatory cytokine production and regulated intestinal immune responses, aiding in the resolution of inflammation.

CONCLUSIONS
This study demonstrates that EVs derived from human breast milk play a crucial role in IBD treatment, with immunoglobulins significantly contributing to the mechanisms of inflammation reduction. These findings suggest that EV-based therapies could provide an effective immunological approach to IBD treatment.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_202

PROTECTIVE EFFECTS OF EDIBLE GINSENG-DERIVED EXTRACELLULAR VESICLES ON LIVER FIBROSIS: REGULATION OF TIMP2/MMPS PATHWAYS AND GUT MICROBIOTA MODULATION

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BACKGROUND AND OBJECTIVES
Metabolic dysfunction-associated fatty liver disease (MASLD) and alcohol-associated liver disease (ALD) represent chronic liver diseases that can progress to steatohepatitis (inflammation), liver fibrosis/cirrhosis, liver failure, and death. Unfortunately, there are few medicines approved for treating liver fibrosis/cirrhosis. Therefore, in this study, we investigated the protective effects of ginseng-derived extracellular vesicles (GDEVs) administration on liver fibrosis.

METHODS
We administered GDEVs to mouse and cell models of liver fibrosis. The effects were assessed through histological analysis and biomarker measurements to evaluate fibrosis mitigation.

RESULTS
GDEVs successfully reached the gut or liver in both *in vitro* and *in vivo* models without much degradation or cytotoxicity. GDEVs administration decreased serum endotoxin levels and restored intestinal barrier proteins with gut microbiome changes in both MASLD and ALD mouse models. Additionally, GDEVs administration reduced oxidative stress and fibrosis maker proteins to baseline levels in both models of MASLD and ALD mice. GDEVs also ameliorated liver fibrosis through regulating TIMP2/MMPs pathways in LX-2 human stellate cells and MASLD mice.

CONCLUSIONS
These RESULTS demonstrate for the first time that GDEVs can prevent MASLD- and ALD-mediated intestinal hyperpermeability and liver fibrosis through the gut-liver axis via restoration of gut microbiome and attenuating oxidative stress and fibrosis marker proteins.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_203

INTEGRATIVE TRANSCRIPTOMIC AND BIOINFORMATIC ANALYSIS OF CINNAMOMUM ZEYLANICUM ESSENTIAL OIL'S CYTOTOXIC EFFECTS ON CERVICAL CANCER CELL LINES

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BACKGROUND AND OBJECTIVES
Cinnamomum zeylanicum (cinnamon) is a plant widely used in culinary applications, with essential oil rich in volatile compounds that exhibit biological activities, including anticancer properties. However, its effects and mechanisms of action in cervical cancer are not well understood. This study aimed to perform an integrative transcriptomic and bioinformatic analysis to evaluate the cytotoxic effects of cinnamon essential oil (CEO) on cervical cancer cell lines, focusing on its molecular mechanisms and pathways involved in its anticancer activity.

METHODS
Experiments were conducted on two tumorigenic cell lines, HeLa and SiHa, and one non-tumorigenic cell line, HaCaT. Cell viability was assessed using the WST-1 assay, apoptosis and cell death through Annexin-V and propidium iodide staining, and caspase activation by flow cytometry. RNA sequencing was employed followed by an integrative bioinformatic analysis.

RESULTS
CEO significantly reduced cell viability, increased apoptosis, and activated caspase 9 in HeLa and SiHa cells. Transcriptomic analysis revealed upregulation of genes involved in cellular stress, DNA damage, and protein synthesis. Differentially expressed genes were enriched in apoptosis, cell cycle, and p53 signaling pathways. CEO also suppressed genes related to oxidative phosphorylation and the cell cycle, with HeLa cells showing the highest sensitivity. Weighted gene co-expression network analysis identified key genes regulated by CEO, including *MT-CO1, MT-CO2, PPP1R15A, HSPA6, ATF3, DDIT3, DEDD2, HMOX1, CXCL8, FOSB, and CDKN1A.*

CONCLUSIONS
These RESULTS demonstrate that CEO has potent antiproliferative and proapoptotic effects on cervical cancer cells, suggesting its potential as an anticancer agent. Further research is needed to validate these findings and evaluate its safety and efficacy in *in vivo* models.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_208

ASSESSING THE IMPACT OF A DIVERSE FIBER MIX ON GASTROINTESTINAL TOLERANCE AND MICROBIOTA COMPOSITION IN HEALTHY ADULTS

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BACKGROUND AND OBJECTIVES

Fibers are inherently present in a wide range of naturally occurring foods, predominantly grains, fruits, vegetables and legumes, and each fiber source has specific physicochemical and chemical properties. The average fiber recommendation in a Western diet is approximately 25 g/day. In the Western diet the fiber recommendation is often not met, resulting in a so-called “fiber-gap”. Adequate fiber intake is associated with several health benefits and reduced disease risk. These benefits often originate from the gut, where fibers undergo microbial fermentation and microbial metabolites are produced. As with consuming a diverse, healthy diet, we hypothesize that consuming a variety of fiber sources and types could support a diverse collection of gut bacteria which may help to maintain a balanced and resilient microbiome. However, this diverse fiber mix should be well tolerated. Thus, we aimed to assess gastrointestinal (GI) tolerance of a novel diverse gluten-free fiber mix and its impact on the microbiota and microbial metabolites in healthy adults.

METHODS

We conducted an open label, single arm, single-centre study in 45-69-year-old healthy male and female participants consuming 2x 3 g/day of a diverse gluten-free fiber mix for 4 weeks, in addition to their habitual diet. GI symptoms were assessed weekly using the validated Gastrointestinal Symptom Rating Scale (GSRS). Additionally, fecal form type (Bristol Stool Chart), defecation frequency, digestion-related quality of life (Digestion-associated Quality of Life Questionnaire, DQLQ), compliance, stool samples and dietary intake were evaluated.

RESULTS

Of the 43 recruited participants, 41 were included in the full analysis set. No increase in any of the GSRS dimensions was observed during the intervention compared to baseline, nor in fecal form type at week 1 and week 4 compared to baseline. The majority of participants reported normal fecal form type. We observed a significant increase in mean defecation frequency at week 1 compared to baseline, there was no difference after 4 weeks. The increase in DQLQ score from baseline to week 4 reached statistical significance but both scores were close to the minimum of 0, hence the change was not considered meaningful. Study product intake compliance was ~96-99% for both quantity and number of servings. Analysis of dietary intake, microbiota and microbial metabolite is presently ongoing.

CONCLUSIONS

Consuming 6g of a diverse gluten-free fiber mix in addition to the habitual diet was well tolerated. Having access to a variety of gluten-free fiber sources would benefit those individuals unable to meet the recommended daily take due to dietary habits or restrictions.

CONFLICTS OF INTERESTS

As per affiliation LD, MK, ST, JvB, JdV, AB, LH, and AvH are employed by Danone Research & Innovation and have no further interest to disclose.

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EPO8_209

THE EFFECTS OF ORAL IRON SUPPLEMENTATION ON SERUM HEPCIDIN AND GLUCOSE METABOLISM DURING PREGNANCY

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BACKGROUND AND OBJECTIVES
Gestational diabetes mellitus (GDM) and iron deficiency (ID) are common during pregnancy, both increasing the risk of complications. High circulating hepcidin may contribute to iron loading in hepatic and adipose tissue, reducing insulin sensitivity and causing metabolic dysfunction. In young women with ID, high oral iron doses trigger an acute hepcidin increase. Whether this occurs during pregnancy and impacts insulin sensitivity remains unclear. This study aims to determine whether high iron doses during pregnancy acutely increase hepcidin levels and affect glucose metabolism by decreasing insulin sensitivity.

METHODS
Pregnant women at 24th-28th weeks of gestation were divided into two groups: the ‘high iron’ group, received 200 mg of oral iron on study days 3-6, and the ‘low iron’ group, which received 15 mg oral iron on days 0-14. Oral glucose tolerance test (OGTT) were performed on days 0 and 7, and a final blood sample was collected on day 14.

RESULTS
Data from twenty-five women (‘high iron’ group: n=14; ‘low iron’ group: n=11) were analysed. High-dose iron supplementation significantly increased serum hepcidin on day 7 ($p=0.011$), compared to day 0 and day 14 ($p<0.05$). No changes were observed in haemoglobin, iron status and inflammatory parameters. Iron supplementation had no effect on fasting blood glucose or fasting insulin. However, the rise in blood glucose during the OGTT was significantly greater on day 7 compared to day 0 in the ‘high iron’ group ($p = 0.022$). No such difference was observed in the ‘low iron’ group, ($p = 0.214$).

CONCLUSIONS
Preliminary data indicate that high oral iron doses during pregnancy increase serum hepcidin levels at 24 hours and elevate glucose levels following an OGTT. Additionally, there is a trend suggesting an increase in fasting insulin and a greater insulin response during the OGTT after high iron supplementation compared to baseline.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_211

EVALUATION OF THE BIOLOGICAL POTENTIAL OF ELDERBERRY (SAMBUCUS NIGRA L.) FROM MONTENEGRO: POLYPHENOLIC PROFILE, MODULATION OF ICAM-1 EXPRESSION AND 12-HETE, PGE2 AND TXA2 PRODUCTION

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BACKGROUND AND OBJECTIVES
Elderberry (*Sambucus nigra* L.) is recognized for its high concentration of bioactive polyphenolic compounds, which offer considerable nutritional and therapeutic benefits. Therefore, interest in food supplements made from this fruits is steadily increasing. Northern Montenegro, a region abundant in wild-growing elderberries, offers favorable environmental conditions for their healthy growth, yet the exploitation of elderberries from this area remains minimal. This study aimed to investigate the polyphenolic profile and biological potential of elderberries from this region, focusing on their anti-inflammatory effects.

METHODS
Elderberry fruits were lyophilized, and water extracts were prepared by microwave-assisted extraction. The polyphenolic profiles were quantified by HPLC-UV/VIS, while total phenols, tannins, flavonoids, and anthocyanins were analyzed spectrophotometrically. The ability of the extract to modulate ICAM-1 expression was evaluated in HMEC-1 endothelial cells treated with the extract (50–500 µg/mL). ICAM-1 expression was induced with TNF-α and analyzed by fluorescence-activated cell sorting. Additionally, the extract's impact on arachidonic acid metabolism was examined *ex vivo* using platelets. Inflammation was induced with calcimycin (Calcium Ionophore A23187) and CaCl2, while quantification of 12-HETE, PGE2, and TXA2 in the cell lysate was performed by LC-MS/MS.

RESULTS
The quantitative analysis of 40 polyphenolic compounds resulted in the detection of 13 compounds, with cyanidin-3-*O*-glucoside and rutin as the most abundant. The extract demonstrated a dose-dependent inhibition of ICAM-1 expression (12-26%). Regarding arachidonic acid metabolism, the extract (c=1.5 mg/mL) exhibited the most significant inhibition of PGE2 (71%), followed by 12-HETE (38%) and modest inhibition of TXA2 (11%).

CONCLUSIONS
These findings highlight the potential of elderberries from Montenegro as a promising source of bioactive compounds with broad applications in the food and pharmaceutical industries, particularly for products aimed at inflammation prevention.
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The authors have no conflict of interest.

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EPO8_215

SLEEP DISORDERS (SD) AND ASSOCIATED FACTORS IN SEVERELY MALNOURISHED ADULT PATIENTS WITH ANOREXIA NERVOSA (AN)

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BACKGROUND AND OBJECTIVES
Severely malnourished patients with AN may present SD. The aim of this study was to characterize these SD and to investigate the possible link between severe undernutrition, and sleep disorders in a cohort of malnourished patients with AN.

METHODS
We conducted an observational study including adult inpatients in a intensive care clinical nutrition department in Paul Brousse university hospital for nutritional rehabilitation. Nutritional status (BMI (kg/m²), plasma albumin (g/L), transthyretin (in g/L) and Triiodothyronin (in pmol/L)); quality and quantity sleep (Epworth Sleepiness Scale, Pittsburgh Sleep Quality Index (PSQI) and Insomnia Severity Index (ISI)) and psychiatric symptoms (Beck scale, Eating Disorder Inventory 2nd edition and the Godin Leisure-Time Exercise) were assessed at admission.

RESULTS
Thirty-seven patients were included: age: 32.6 +/-15.3, sex ratio : 2M/35F, BMI : 12.4 +/-2.1; 78.4% have poor sleep quality, 59.5% suffer from insomnia and 37.8% have a sleep debt. there was no daytime sleepiness on the Epworth scale (7.08+/-4.5), but insomnia on the ISI scale (10.19+/-6.36). The most pathological components on the PSQI were subjective sleep quality (1.65+/-0.86), sleep disturbance (1.57+/-0.5), poor daytime form (1.38+/-0.92) and sleep latency (1.35+/-0.98). In bivariate analysis, quality of sleep waw significantly correlated with the depressive symptoms (Beck) and AN specific symptom (EDI): the higher the Beck scales, the higher the scales on the three sleep questionnaires ($p<0,01$ for Epworth and ISI scales; $p = 0,02$ for PSQI scale). The RESULTS are similar with the EDI score ($p<0,016$ for the three scales). there was no link between nutritional status and sleep disorders.

CONCLUSIONS
All patients with AN have sleep disorders with sleep onset and / or sleep quality disorders, associated with the severity of AN symptoms but not with the nutritional status. Larger longitudinal studies are needs to confirm the role of nutritional status in steep disturbances.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_216

EFFECTS OF DIETARY OMEGA-3 FATTY ACIDS ON SYNAPTIC STRUCTURE AND FUNCTION

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BACKGROUND AND OBJECTIVES
Ageing is associated with a decrease in omega-3 fatty acid concentrations, and low intake of omega-3 fatty acids has been linked to neurodevelopmental and neurodegenerative disorders. Yet, there is a lack of understanding of the molecular mechanisms underlying the effects of omega-3 fatty acids in the development and function of synapses in the central nervous system.
The objectives are to investigate the possible role of omega 3 fatty acids in sustaining synaptic structure and function in young adult mice.

METHODS
We use omega-3 fatty acids as anti-neuroinflammatory agents. We have fed young mice (C57BL/6) with a diet with or without the omega-3 fatty acids docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) for 5 months after weaning. The methods used are: Western blot, Golgi staining, Morris water maze and whole blood testing.

RESULTS
The dietary intervention led to an 1100 % increase in the concentration of DHA when measuring area percentage of fatty acid methyl ester (FAME) in whole blood compared to negative controls, while the corresponding increase in EPA was even higher (4000 %). In the brain, we found significantly increased dendritic spine density in the hippocampus in the omega 3-group. Furthermore, we observed significantly increased concentrations of the synaptic glutamate receptor subunits GluA1, GluA2, GluN2B, and a reduction in microglia marker Iba1, in brain hippocampal homogenate in the omega-3 group, compared to negative controls. In the corresponding homogenate of cerebral cortex we observed increased GluA2, GluN2B and synaptic protein synaptotagmin 1, while reduction of Iba1, and neuronal growth factors mBDNF and ProBDNF. When tested in a Morris water maze for learning abilities, there was a trend towards quicker learning in the omega 3 fatty acid enrichment group.

CONCLUSIONS
Dietary supplementation of omega-3 fatty acids increases their concentrations in whole blood. In the brain, we observed increased dendritic spine density. In addition, the concentrations of brain synaptic glutamate receptors are increased in the omega-3 diet group while it interestingly reduces the microglial inflammatory marker Iba1 in the hippocampus. The omega-3 enriched diet also improved learning measures in the Morris water maze.

CONFLICTS OF INTERESTS
The authors have no conflict of interest.

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EPO8_219

IMPACT OF PHENOLIC ACIDS ON PROSTAGLANDIN E2 AND THROMBOXANE A2 PRODUCTION IN INFLAMMATORY PROCESSES

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BACKGROUND AND OBJECTIVES

Phenolic acids are secondary plant metabolites, but they can also be formed by the metabolism of polyphenols in the human body. These compounds may exhibit different bioactivities, including antioxidant and anti-inflammatory. Inflammation can lead to numerous disease, such as cardiovascular and neurodegenerative diseases, cancer etc. The overproduction of pro-inflammatory mediators such as prostaglandin E2 (PGE2) and thromboxane A2 (TXA2) through the cyclooxygenase (COX) pathway of arachidonic acid metabolism, has important role in inflammation.
The aim of this study was to determine the anti-inflammatory potential of 7 selected phenolic acids (gallic acid; 3-*O*-methyl gallic acid; 4-*O*-methyl gallic acid; 3-(3-hydroxyphenyl)propionic acid; 3-(4-hydroxyphenyl)propionic acid; 3-hydroxyhippuric acid; 4-hydroxyhippuric acid) and their ability to inhibit production of PGE2 and TXA2 in an *in vitro* cell-based model (human monocytes, U937 cell line).

METHODS

The anti-inflammatory potential of phenolic acids was tested at five different concentrations, ranging from 1 to 25 μM. Inflammation was induced by lipopolysaccharide (LPS). The content of PGE2 and TXA2 in cell lysate was evaluated using LC-MS/MS technique. RESULTS are presented as percentages of production relative to control.

RESULTS

Only 4-*O*-methylgallic acid inhibited the production of PGE2 at all tested concentrations (up to 15%), with no dose-dependent effect observed. On the other hand, several phenolic acids inhibited the production of TXA2 at all applied concentrations, while the others reduced production of the pro-inflammatory mediator TXA2 only at concentrations higher than physiological levels (greater than 5 μM).

CONCLUSIONS

The RESULTS suggest that not all phenolic acids have considerable effects on PGE2 and TXA2 production at physiological concentrations. There is need for futhere investigation about different mechanisam of anti-inflammatory actions of phenolic acids or their potential synergistic effect at physiological concentrations.
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EPO8_220

PERCEPTIONS OF AFRICAN MIGRANT WOMEN REGARDING HEALTHY AND UNHEALTHY FOODS DURING PREGNANCY AND THE POSTPARTUM PERIOD IN AUSTRALIA: A QUALITATIVE STUDY

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BACKGROUND AND OBJECTIVES
Women face challenges choosing and identifying healthy foods during pregnancy and the postpartum period. For African migrant women, these challenges may be heightened by immigration, as navigating between different cultural values can complicate food decision-making. Understanding African women's perceptions of healthy and unhealthy foods after migrating to Australia is essential to offering effective nutritional support during pregnancy. This study aimed to explore African migrant women's perceptions of healthy and unhealthy foods during pregnancy and the postpartum period in Australia.

METHODS
Participants were recruited through purposive, convenience, and snowball sampling methods. This study used the photovoice method. Participants were asked to take photos representing foods they considered to be healthy and unhealthy during these periods. Semi-structured, photo-assisted interviews were conducted with eleven participants, all of whom were either currently pregnant or had been pregnant within the past five years while living in Australia. A qualitative descriptive approach to analysis was undertaken.

RESULTS
Two key themes were identified: 'perceptions of healthy foods during pregnancy and the postpartum period' and 'perceptions of unhealthy foods during pregnancy and the postpartum period'. Healthy foods during pregnancy were described as balanced, energy-providing, nutrient-restorative, whole, and typically homemade. Similarly, healthy foods were considered to be balanced and filling in the postpartum period. Unhealthy foods during both periods were identified as those high in calories or fat.

CONCLUSIONS
While African migrant women identified clear perceptions of healthy and unhealthy foods during these periods, it remains uncertain to the extent that these perceptions translate into consistent dietary practices. Further research is needed to explore participants' actual food intake and diet quality during these critical periods. These findings underscore the importance of integrating cultural flexibility and adaptability into dietary guidance for migrant women.

CONFLICTS OF INTERESTS
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